

**SOLANO
City-County Coordinating Council**

MEMBERS

Linda J. Seifert
Chair
*Supervisor, Solano
County, District 2*

Elizabeth Patterson
Vice Chair
Mayor, City of Benicia

Jack Batchelor
Mayor, City of Dixon

Harry Price
Mayor, City of Fairfield

Norman Richardson
Mayor, City of Rio Vista

Pete Sanchez
*Mayor, City of Suisun
City*

Steve Hardy
Mayor, City of Vacaville

Osby Davis
Mayor, City of Vallejo

Erin Hannigan
*Supervisor, Solano
County, District 1*

Jim Spering
*Supervisor, Solano
County, District 3*

John Vasquez
*Supervisor, Solano
County, District 4*

Skip Thomson
*Supervisor, Solano
County, District 5*

SUPPORT STAFF:

Birgitta Corsello
*Solano County
Administrator's Office*

Michelle Heppner
*Solano County
Administrator's Office*

Daryl Halls
*Solano Transportation
Authority*

Jim Lindley
City of Dixon

AGENDA

May 8, 2014

Location - Solano County Water Agency, Berryessa Room,
810 Vaca Valley Parkway, Suite 203, Vacaville, CA.

7:00 P.M. Meeting

PURPOSE STATEMENT – City County Coordinating Council

“To discuss, coordinate, and resolve City/County issues including but not necessarily limited to land use, planning, duplication of services/improving efficiencies, as well as other agreed to topics of regional importance, to respond effectively to the actions of other levels of government, including the State and Federal government, to sponsor or support legislation at the State and Federal level that is of regional importance, and to sponsor or support regional activities that further the purpose of the Solano City-County Coordinating Council.”

Time set forth on agenda is an estimate. Items may be heard before or after the times designated.

ITEM

AGENCY/STAFF

I. CALL TO ORDER (7:00 p.m.)
Roll Call

II. APPROVAL OF AGENDA (7:00 p.m.)

III. OPPORTUNITY FOR PUBLIC COMMENT (7:10 p.m.)

Pursuant to the Brown Act, each public agency must provide the public with an opportunity to speak on any matter within the subject matter of the jurisdiction of the agency and which is not on the agency's agenda for that meeting. Comments are limited to no more than 5 minutes per speaker. By law, no action may be taken on any item raised during public comment period although informational answers to questions may be given and matter may be referred to staff for placement on future agenda.

This agenda shall be made available upon request in alternative formats to persons with a disability, as required by the Americans with Disabilities Act of 1990 (42U.S.C.Sec12132) and the Ralph M. Brown Act (Cal.Govt.Code Sec.54954.2) Persons requesting a disability-related modification or accommodation should contact Jodene Nolan, 675 Texas Street, Suite 6500, Fairfield CA 94533 (707.784.6108) during regular business hours, at least 24 hours prior to the time of the meeting.

IV. CONSENT CALENDAR

a. Approval of Minutes for March 13, 2014
Action Item (7:15 p.m.)

Chair Seifert

V. DISCUSSION CALENDAR

1. Legislative Update (Including Qualified Initiatives for the June Ballot)

Action Item (7:15 p.m. – 7:45 p.m.)

Presenters: Michelle Heppner, Legislative, Intergovernmental, and Public Affairs Officer, Solano County and Paul Yoder, Shaw, Yoder, Antwih, LLC.

2. Strategic Growth Council Climate Action Planning Update – *Action Item*
(7:45 p.m. – 8:00 p.m.)

Presenters: Robert Macaulay, Director of Planning, Solano Transportation Authority

3. Local Affordable Care Act Implementation Update
(8:00 p.m. – 8:15 p.m.)

Presenters: Ann Edwards, Director of Health and Social Services, Solano County

4. Countywide Economic Diversification Project Update
(8:15 p.m. – 8:30 p.m.)

Presenters: Steve Pierce, Senior Management Analyst, CAO, Solano County

5. Travis Community Consortium Update
(8:30 p.m. – 8:45 p.m.)

Presenters: Sandy Person, Chair, Travis Community Consortium (TCC)

VI. ANNOUNCEMENTS

VII. CCCC CLOSING COMMENTS

ADJOURNMENT: The next City-County Coordinating Council meeting is scheduled for August 14, 2014 at 7:00 p.m. at the Solano County Water Agency – Berryessa Room, 810 Vaca Valley Parkway, Suite 203, Vacaville, CA.

CITY-COUNTY COORDINATING COUNCIL
March 13, 2014 Meeting Minutes

The March 13, 2014 meeting of the Solano City-County Coordinating Council was held in the Berryessa Room at the Solano County Water Agency located at 810 Vaca Valley Parkway, Ste 303, Vacaville, CA 95688.

I. Roll and Call to Order

Members Present

Jack Batchelor, Chair	Mayor, City of Dixon
Linda Seifert, Vice Chair	Solano County Board of Supervisors (District 2)
Harry Price	Mayor, City of Fairfield
Steve Hardy,	Mayor, City of Vacaville
Norm Richardson	Mayor, City of Rio Vista
Pete Sanchez	Mayor, City of Suisun City
Osby Davis	Mayor, City of Vallejo
Erin Hannigan	Solano County Board of Supervisors (District 1)
John Vasquez	Solano County Board of Supervisors (District 4)
Skip Thomson	Solano County Board of Supervisors (District 5)

Members Absent

Elizabeth Patterson	Mayor, City of Benicia
Jim Spering	Solano County Board of Supervisors (District 3)

Staff to the City-County Coordinating Council Present:

Birgitta Corsello	County Administrator, Solano County
Nancy Huston	Assistant County Administrator, Solano County
Sean Quinn	City Manager, City of Fairfield
Daryl Halls	Executive Director, Solano Transportation Authority

Other Staff Present

David Okita	General Manager, Solano County Water Agency
Bill Emlen	Director, Department of Resource management, Solano County
Chuck Lomeli	Treasurer / Tax Collector / Co Clerk, Solano County
Narcisa Untal	Senior Planner, Department of Resource Management, Solano County

Guest Speakers Present

Paul Yoder	Legislative Advocate, Shaw/Yoder/Antwih Inc.
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I. Meeting Called to Order

The meeting of the City-County Coordinating Council called to order at 7:05 pm.

II. Approval of Agenda

A motion to approve the Agenda was made by Mayor Batchelor and seconded by Mayor Hardy. Agenda approved by 10-0 vote.

III. Confirmation of the Vice Chair for 2014

A motion to approve the confirmation of Mayor Patterson as Vice Chair for the CCCC for 2014 and Mayor Richardson as the alternative Vice Chair was made by Mayor Batchelor and seconded by Mayor Richardson. Approved by 10-0 vote.

IV. Opportunity for Public Comment

No public comments were received.

V. Consent Calendar

a. Approval of minutes for March 13, 2014

Motion to approve the January 9, 2014 minutes was made by Supervisor Vasquez and seconded by Mayor Price. Minutes approved by 10-0 vote.

VI. Discussion Calendar

1. Approve the Amended 2014 CCCC State and Federal Legislative Platform.

Nancy Huston, Assistant County Administrator for Solano County noted the redlined amendments to the CCCC 2014 State and Federal legislative Platform and requested final approval. Supervisor Hannigan requested a minor change related to the wording on the "alternate intake to the North Bay Aqueduct" under the Agriculture, Natural Resources, and Water section of the document. Supervisor Hannigan also requested the bullets be turned into numbers for easy reference. A suggestion was made by Mayor Batchelor to use the same language that was included in the Solano County's white paper that went to Senator Wolk. Supervisor Hannigan agreed that the language in the white paper would address her concern.

Mayor Batchelor made a motion to approve the CCCC 2014 State and Federal legislative Platform with the proposed amendments. A motion was seconded by Supervisor Hannigan. Approved by 10-0 vote

2. Legislative Update.

Paul Yoder of Shaw, Yoder, and Antwih, Inc. provided a legislative update. Mr. Yoder announced that the State's finances are at least \$2 billion above current projections. Essentially allowing for up to \$4 billion in excess in the new fiscal year which Mr. Yoder noted is how the Legislature will view it when deciding on spending levels for the FY2014-15 State budget.

With regards to the water bond proposals, Mr. Yoder also noted the difference in vote requirements to move the existing water bond to a future statewide ballot versus putting an entirely new water bond on the ballot. The former taking a simple majority vote on both floors of the legislature and the latter necessitating a two-thirds vote (27 votes in the Senate and 54 votes in the Assembly). Mr. Yoder noted the legislative impacts of no longer having a democratic supermajority in the Senate due to the recent legal issues surrounding three democratic legislators would require a Republican to vote in favor of a water bond measure. Mr. Yoder noted that for any water bond to be successful would need to include a water storage option and that Assemblymember Rendon recently increased his water bond proposal (AB 1331) by \$2.5 billion to include water storage.

Mr. Yoder also discussed the two proposed ballot measures slated for the June statewide primary ballot, as well as the measures already on the November statewide general election ballot. He noted that several dozen measures were still in the signature gathering phase in an attempt to qualify for the November ballot.

Supervisor Thomson mentioned that the County supports SB 1410, a bill authored by Senator Wolk regarding Payment In Lieu of Taxes (PILT) and inquired whether counties might see it funded in the FY 2014-15 State Budget. He noted that Solano County had not been paid in twelve years and that the State owes the County close to \$600,000. Mr. Yoder acknowledged that Senator Wolk was pursuing her SB 1410 and also banding together with other legislators to get funding in the state budget, but that the matter had been complicated due to pending litigation brought about by Glenn County on the issue.

Mr. Yoder mentioned that the Williamson Act was a priority for other counties and that it was slated to be heard in committee later in March.

3. State Cap & Trade Revenues.

Daryl Halls, Executive Director for Solano Transportation Authority (STA) introduced the item and provided a printed presentation to the CCCC. Presentation slides attached. Mr. Halls noted that Cap & Trade revenues stem from the AB 32 – California Global Warming Solutions Act in 2006 and SB 375 Sustainable Communities and Climate Protection Act in 2008 which also enabled the California Air Resources Board (CARB) to set targets for 2020 and 20135 based on the two pieces of legislation. This in turn caused Regional Transportation Boards to include them in their regional transportation plans. In Solano County, that is Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG).

Mr. Halls stated that the reason this issue was coming forward now was based on CARB's statewide auctions to collect revenues from Cap & Trade. He noted that in January 2014 the Governor proposed to expend \$850 million in Cap & Trade funds on various state agency activities and does not include any revenues going to regional or local agencies. \$600 million of the \$850 million (70 percent) would be allocated to sustainable communities and clean transportation with half of the funding going to high speed rail (\$300 million with \$50 million to intercity or urban rail), CARB (\$200 million), and the Strategic Growth Council ((\$100 million). Mr. Halls noted that the Governor's proposal does not guarantee that any of the Cap & Trade funds will go to local agencies to implement AB 32 and SB 375.

Mr. Halls noted that in anticipation of the statewide auctions, in December MTC put forward a framework of how Cap and Trade funds should be allocated. MTC's framework consists of five categories. Mr. Halls noted that the STA Board supports MTC's framework for \$500 million be dedicated to regional and local agencies to implement these two climate change initiatives. The STA Board supports \$500 million for intercity rail systems such as the Capitol Corridor. The STA Board supports MTC's

Mr. Halls requested the CCCC:

1. Support requesting Solano County State Legislators support \$500 of Cap and Trade revenues for Sustainable Communities and Clean Transportation be allocated to the regions for implementation of SB 375 at the regional/local level
2. Support requesting Solano County State Legislators support increasing the amount of Cap and Trade Rail Modernization funds dedicated for intercity and urban rail systems from \$50 million to at least \$500m and be allocated to each intercity and urban rail operator via formula by the CTC

A motion to approve the amended recommendations to include \$500 million in each category was made by Mayor Hardy and seconded by Mayor Davis. Approved by a 10-0 vote.

3. Solano County PACE Program Update

Chuck Lomeli, Treasurer, Tax Collector, and Co Clerk for Solano County made a presentation on the status of property assessed clean energy (PACE) program in Solano County. The County currently has two providers, California First and the HERO program sponsored by the Western Riverside Council of Governments (WRCOG) to provide PACE services for commercial and residential customers. The cities of Benicia, Suisun, Vallejo, Fairfield, and Dixon are also members of the California First program. The city of Vacaville has joined the HERO program. The next step in bringing these programs to fruition in the county is to get all the cities to join one or both programs so the providers can service residential and commercial properties in their jurisdictions.

John Law, a representative of the Hero program was present and gave an update on the HERO program statewide, and in the county.

H. Simon Bryce, a representative of the California First program was present to give an update on the California First program statewide and in the county. Mr. Brice also indicated that 5 applications have been submitted for projects in the county representing over \$2 Million in energy improvements.

4. Single Use Plastic Bags Discussion

Narcisa Untal, Senior Planner with Solano County's Resource Management Department made a presentation on single use plastic bags including model ordinances where other counties have adopted to prohibit single use plastic bags. Ms. Untal also discussed SB 270. Presentation slides attached.

Supervisor Hannigan stated it was her passion to eliminate the use of single-use plastic bags from Solano County for a variety of reasons including Mayor Batchelor's point on recycling, knowing these bags are not recyclable and those that do equate to less than five percent. Supervisor Hannigan stated her desire is to stop the use of single-use plastic bags at the point-of-sale. She noted that by doing so would largely reduce them from ending up in our communities, storm drains, and the landfills. Supervisor Hannigan also noted that with Solano County

being surrounded by the bay, it contributes significantly to the over one million plastic bags that end up in the bay. Supervisor Hannigan further noted that several efforts had been made by the State Legislature in past years to address this issue however none have come to fruition. She stated that Solano County could not wait until a State solution is found, rather her goal (and ask of the CCCC) was to get support from the CCCC to work together with the seven cities staff and the County to collaborate on an ordinance that best fits every organization's needs.

A lively discussion pursued with several CCCC members providing comments on the benefits a ban might have on the environment and the community, how the proposed ten cents per plastic bag should be utilized/distributed, concerns over business impacts, educating the public, and incentive programs for using reusable grocery bags.

Following the discussion and comments from the public, Chair Seifert noted that there appeared to be a consensus to have staff work on a joint city-county ordinance and bring it back to the CCCC in 90 days.

A motion was made to have County staff develop a joint ordinance with the cities through the Local Task Force for Integrated Waste Management and return to the CCCC in 90 days by Mayor Price and seconded by Supervisor Hannigan. Approved by 10-0 vote.

VI. ANNOUNCEMENTS:

No announcements.

VII. ADJOURNMENT: The meeting was adjourned at 8:45 p.m. The next meeting will be May 8, 2014 in the Berryessa Room at the Solano County Water Agency located at 810 Vaca Valley Parkway, Ste 303, Vacaville, CA 95688.

**SOLANO
City County Coordinating Council
Staff Report**

Meeting of. May 8, 2014

**Agency/Staff: Michelle Heppner,
Solano County Administrator's
Office, and Paul Yoder, Shaw,
Yoder, Antwih Inc.**

Agenda Item No: V.1

Title /Subject: Legislative Update

Background:

At each CCCC meeting, staff provides a legislative update to keep members informed of activities at the State and Federal level.

Discussion:

CCCC staff and the County's legislative advocate, Paul Yoder from Shaw, Yoder, Antwih, Inc. will provide an oral update on legislative issues of concern to the County and the cities.

Of particular interest is House Resolution 29 relative to outsourcing public services which was requested to be included in the legislative update during the CCCC Joint Steering Committee's meeting to discuss the CCCC agenda. Text for HR 29 is contained in Attachment 1.

The following two measures have qualified for the June 3rd ballot.

1. The Veterans Housing and Homeless Prevention Bond Act of 2014

According to the authors, California is home to almost two million veterans, more than any other state in the nation, and with the winding down of the wars in Iraq and Afghanistan, an unprecedented number of California veterans will return to our communities, many in need of housing, employment, mental health and drug treatment, and physical rehabilitation.

2. Public Records. Open Meetings. State Reimbursement to Local Agencies

A Legislative Constitutional Amendment proposed by Senate Constitutional Amendment 3 of the 2013–2014 Regular Session (Resolution Chapter 123, Statutes of 2013) expressly amends the California Constitution by amending sections thereof; therefore, new provisions proposed to be added are provided beginning on page 42 of Attachment 2 and printed in *italic type* to indicate that they are new.

Recommendation: Receive a report on legislative matters of concern.

Attachments:

1. California State Assembly House Resolution H.R. 29 Text, Analysis, and Position List
2. Text of proposed laws - Propositions 41 and 42.

AMENDED IN ASSEMBLY APRIL 3, 2014

AMENDED IN ASSEMBLY MARCH 13, 2014

CALIFORNIA LEGISLATURE—2013–14 REGULAR SESSION

House Resolution

No. 29

Introduced by Assembly Member Gomez

(Coauthors: Assembly Members Alejo, Ammiano, Atkins, Bloom, Bocanegra, Bonilla, Bonta, Bradford, Buchanan, Campos, Chau, Chesbro, Dababneh, Dickinson, Fong, Frazier, Gatto, Gonzalez, Hall, Roger Hernández, Holden, Jones-Sawyer, Lowenthal, Nazarian, Pan, John A. Pérez, Quirk, Rendon, Ridley-Thomas, Rodriguez, Skinner, Stone, Ting, Weber, Wieckowski, Williams, and Yamada)

February 4, 2014

House Resolution No. 29—Relative to outsourcing public services.

1 WHEREAS, Public services and assets are the fabric that binds
2 our communities together. They are also a ladder to the middle
3 class; and

4 WHEREAS, Faced with severe budget problems in the wake
5 of the Great Recession, state and local governments across America
6 are handing over control of public services and assets to
7 corporations that promise to operate them better, faster, and
8 cheaper; and

9 WHEREAS, Outsourcing these services and assets often fails
10 to keep these promises, and too often it undermines transparency,
11 accountability, and shared prosperity and competition - the
12 underpinnings of democracy itself; and

13 WHEREAS, Outsourcing means that taxpayers have less say
14 over how future tax dollars are spent and have no ability to vote

1 out executives who make decisions that could harm the public
2 interest; and

3 WHEREAS, Outsourcing means taxpayers are often
4 contractually limited to a single for-profit corporation; and

5 WHEREAS, Outsourcing frequently means that wages and
6 benefits for public service workers fall and the local economy
7 suffers while corporate profits rise. The Center for American
8 Progress Action Fund has found that of the 5.4 million people
9 working for federal service contractors in 2008, an estimated 80
10 percent earned below the living wage for their city or region.
11 For-profit corporations are three times more likely than the public
12 sector to employ workers at poverty-threshold wages; and two
13 million private sector employees working for federal contractors
14 earn less than \$12 an hour - too little to support a family. That is
15 more low wage workers than are employed by McDonald's and
16 WalMart combined; and

17 WHEREAS, Outsourcing means that taxpayers often no longer
18 know how their tax dollars are being spent. Meetings and records
19 that used to be open to the public can become proprietary
20 information when corporations take over; and

21 WHEREAS, The Taxpayer Empowerment Agenda is one model
22 that may help ensure transparency, accountability, shared
23 prosperity, and competition in the operation of public services and
24 assets; and

25 WHEREAS, Planks in the Taxpayer Empowerment Agenda
26 would require governments to post information about their
27 contracts online and require contractors to open their books to the
28 public, ensure that governments have the capacity to adequately
29 oversee contracts, to cancel contracts that fail to deliver on their
30 promises, prohibit law breaking companies from getting
31 government contracts, require contractors to pay their employees
32 living wages and benefits, require competitive bidding on contracts
33 that guarantee company profits at the expense of taxpayers; and

34 WHEREAS, Recent polling shows that taxpayers oppose the
35 outsourcing of public services and assets to for-profit companies
36 and support these common sense controls to ensure that their
37 interests are protected; now, therefore, be it

38 *Resolved by the Assembly of the State of California, That the*
39 *Assembly opposes outsourcing of public services and assets, which*
40 *harms transparency, accountability, shared prosperity, and*

1 competition, and supports processes that give public service
2 workers the opportunity to develop their own plan on how to
3 deliver cost-effective, high-quality services; and be it further

4 *Resolved*, That the Assembly urges local officials to become
5 familiar with the provisions of the Taxpayer Empowerment
6 Agenda; and be it further

7 *Resolved*, That the Assembly intends to introduce and advocate
8 for responsible outsourcing legislation; and be it further

9 *Resolved*, That the Chief Clerk of the Assembly transmit copies
10 of this resolution to the author for appropriate distribution.

O

Date of Hearing: April 2, 2014

ASSEMBLY COMMITTEE ON PUBLIC EMPLOYEES, RETIREMENT AND SOCIAL
SECURITY

Rob Bonta, Chair

HR 29 (Gomez) – As Amended: March 13, 2014

SUBJECT: Relative to outsourcing public services.

SUMMARY: Resolves that the California State Assembly opposes outsourcing of public services and assets, urges local officials to become familiar with the provisions of the Taxpayer Empowerment Agenda, and intends to introduce and advocate for responsible outsourcing legislation. Specifically, this bill:

- 1) Makes a number of findings about the problems associated with outsourcing public services and assets, including that taxpayers often no longer know how their tax dollars are being spent, and the Taxpayer Empowerment Agenda which could be one model that may help ensure transparency, accountability, shared prosperity, and competition in the operation of public services and assets.
- 2) Resolves that the California State Assembly opposes outsourcing of public services and assets, which harms transparency, accountability, shared prosperity, and competition, and supports processes that give public service workers the opportunity to develop their own plan on how to deliver cost-effective, high-quality service; urges local officials to become familiar with the provisions of the Taxpayer Empowerment Agenda; and, intends to introduce and advocate for responsible outsourcing legislation.

FISCAL EFFECT: Unknown.

COMMENTS: According to the author, "HR 29 would simply seek to affirm the Assembly's opposition to the outsourcing of public services and assets. HR 29 would also provide support for plans that reduce outsourcing, restore transparency and accountability to the provision of state services, and empower public sector workers to deliver cost-effective, high-quality services for our state's taxpayers."

In July of 2013, In the Public Interest (ITPI) released the Taxpayer Empowerment Agenda intended to reign in predatory contracting and help local governments reclaim control of their public services and assets. The Taxpayer Empowerment Agenda is built on four principles: transparency, accountability, shared prosperity and competition. The agenda consists of 11 legislative proposals that are intended to "give taxpayers a say on how their public dollars are spent, allow for scrutiny of how those dollars are spent, and prevents taxpayers from being stuck with a monopoly run by a single corporation for decades."

Supporters state, "Since the start of the Great Recession, many states have turned over critical public services to corporations with promises to save money, only to discover that contracts have lacked transparency and basic accountability for taxpayers, that workers are receiving lower wages and fewer benefit when they need them most, and that the quality of work is often much lower than promised, resulting in further costs. The Taxpayer Empowerment Agenda is a series of specific recommendations, including that information about state contracts are publically available, that companies that avoid paying taxes or break the law cannot receive contracts, that

contracting companies pay a living wage, and that savings for taxpayers, rather than corporate profits, are guaranteed. The Agenda is a win-win-win for California, for taxpayers and for workers, both public and private."

Opponents state that they have "...grave concerns about this resolution which would have legislators take a form of pledge that would potentially restrict their votes on future legislation consistent with the political agenda of an outside national organization. Such efforts undermine the democratic process and representative government and do constituents a disservice by preempting legislators' ability to make an informed decision about the specific impacts of legislation. Local governments have a long history of addressing service delivery challenges with creativity, self-reliance, and innovation. Local elected officials are held accountable for these carefully thought out financial decisions."

Opponents conclude, "The Great Recession has placed great strain on municipalities and their ability to provide a full range of services for their residents. This has been compounded by recent state take-aways including the loss of redevelopment and expanding pension and retiree health care obligations. Further limiting the ability to consider alternative methods of providing services after objective review would do a grave disservice to our communities."

REGISTERED SUPPORT / OPPOSITION:

Support

American Federation of State, County and Municipal Employees (Sponsor)
Association for Los Angeles Deputy Sheriffs
California Association of Professional Employees
California Professional Firefighters
Glendale city Employees Association
In the Public Interest
Los Angeles Alliance for a New Economy
Los Angeles Deputy Probation Officers Union
Los Angeles Police Protective League
Organization of SMUD Employees
Professional Engineers in California Government
Riverside Sheriffs' Association
San Bernardino Public Employees Association
San Luis Obispo County Employees Association
Working Partnerships USA

Opposition

California Bus Association
California Chamber of Commerce
California Contract Cities Association
California Refuse Recycling Council
California Special Districts Association
Charles Abbott Association, Inc.
City of Artesia
City of Brentwood
City of Burbank

City of Claremont
City of Concord
City of Daly City
City of Diamond Bar
City of Downey
City of Fort Bragg
City of Indian Wells
City of La Canada Flintridge
City of La Mirada
City of La Verne
City of Lakeport
City of Lakewood
City of Lathrop
City of Livermore
City of Merced
City of Morgan Hill
City of Monterey
City of Napa
City of Norwalk
City of Oroville
City of Pomona
City of Rancho Cordova
City of Redding
City of Riverside
City of Rosemead
City of Sacramento
City of Salinas
City of San Carlos
City of San Mateo
City of San Rafael
City of Scotts Valley
City of Signal Hill
City of Soledad
City of Tulare
City of Vacaville
City of Walnut
City of West Covina
City of Whittier
El Monte/South El Monte Chamber of Commerce
Greater Merced Chamber of Commerce
League of California Cities
Los Angeles County Business Federation
Los Angeles County Division of the League of California Cities
Marin County Council of Mayors and Council Members
Marin Sanitary Service
Southwest California Legislative Council
Town of Danville
Town of Ross
Zanker Road Resource Management

Analysis Prepared by: Karon Green / P.E., R. & S.S. / (916) 319-3957

House Resolution 29 – Support and Oppose List

4/1/2014 - ASSEMBLY PUBLIC EMPLOYEES, RETIREMENT AND SOCIAL SECURITY (Based on text dated 3/13/2014)

SUPPORT

- Association for Los Angeles Deputy Sheriffs
- California Professional Firefighters
- Glendale City Employees Association (GCEA)
- Riverside Sheriffs' Association
- San Bernardino Public Employees Association (SBPEA)
- San Luis Obispo County Employees Association (SLOCEA)
- Los Angeles Police Protective League
- Organization of SMUD Employees (OSE)
- American Federation of State, County, and Municipal Employees (Sponsor)
- Professional Engineers in California Government
- California Association of Professional Employees
- Working Partnerships USA
- Los Angeles Alliance for New Economy (LAANE)
- In the Public Interest
- Los Angeles Deputy Probation Officers Union

OPPOSE

- California Chamber of Commerce
- City of Lakewood
- League of California Cities
- California Special Districts Association
- Marin Sanitary Service
- City of Sacramento
- City of La Canada Flintridge
- City of Rosemead
- California Contract Cities Association
- California Refuse Recycling Council
- City of Lathrop
- City of Soledad
- City of Napa
- City of Concord
- City of Oroville
- Los Angeles County Business Federation
- City of Downey
- City of Burbank

- City of Indian Wells
- OPPOSE Continued**
- Riverside
- City of Salinas
- City of San Rafael
- California Bus Association
- El Monte/South El Monte Chamber of Commerce
- Southwest California Legislative Council
- City of West Covina
- City of Livermore
- City of Claremont
- City of Vacaville
- City of Norwalk
- City of Signal Hill
- City of Whittier
- City of Monterey
- City of Redding
- City of Merced
- City of Rancho Cordova
- Marin County Council of Mayors and Councilmembers
- Town of Danville
- City of Diamond Bar
- City of La Mirada
- Pomona
- Walnut
- City of Daly City
- Greater Merced Chamber of Commerce
- City of Scotts Valley
- City of Tulare
- City of San Mateo
- Town of Ross
- City of San Carlos
- City of Morgan Hill
- League of California Cities, Los Angeles Division
- City of Brentwood, California
- City of La Verne
- Charles Abbott Association, Inc.
- City of Artesia
- City of Fort Bragg
- City of Lakeport
- Zanker Road Resource Management

PROPOSITION 41

This law proposed by Assembly Bill 639 of the 2013–2014 Regular Session (Chapter 727, Statutes of 2013) is submitted to the people in accordance with the provisions of Article XVI of the California Constitution.

This proposed law adds sections to the Military and Veterans Code; therefore, new provisions proposed to be added are printed in *italic type* to indicate that they are new.

PROPOSED LAW

SECTION 1. Article 5y (commencing with Section 998.540) is added to Chapter 6 of Division 4 of the Military and Veterans Code, to read:

Article 5y. The Veterans Housing and Homeless Prevention Bond Act of 2014

998.540. *This article shall be known and may be cited as the Veterans Housing and Homeless Prevention Bond Act of 2014.*

998.541. (a) *California is home to almost two million veterans, more than any other state in the nation, and with the winding down of the wars in Iraq and Afghanistan, an unprecedented number of California veterans will return to our communities, many in need of housing, employment, mental health and drug treatment, and physical rehabilitation.*

(b) *Unfortunately, California also leads the nation in the number of homeless veterans, roughly 25 percent of the nation's homeless veterans live in California, approximately 19,000 veterans. According to the California Research Bureau, Los Angeles is number one in terms of the number of homeless veterans followed by the San Diego region at number three, and the San Francisco Bay Area at number nine.*

(c) *Moreover, the face of the nation's homeless veterans' population is changing as more OIF/OEF veterans find themselves in a downward spiral towards homelessness and, increasingly, female veterans and their children comprise more and more of the homeless veteran demographic.*

(d) *With their higher rates of post-traumatic stress disorder, substance abuse, and unemployment, as well as the higher incidence of sexual trauma experienced by our female veterans, current homeless veterans, all too often, cycle in and out of our jails, hospitals, and treatment programs, disproportionately drawing down services without receiving the proper services to stabilize their lives.*

(e) *The Legislature must advance a comprehensive, coordinated, and cost-effective approach to respond to the housing needs of our veterans. Such an approach should leverage public and private resources as well as*

align housing and services.

(f) *Five years ago, Californians overwhelmingly affirmed their gratitude to our veterans by approving Proposition 12, a nine hundred million dollars (\$900,000,000) general obligation bond intended to help veterans specifically purchase single family homes, farms, and mobilehomes through the CalVet Home Loan Program.*

(g) *As a result of the nation's economic crisis and state's housing downturn coupled with the changing demographics of our veterans, the Farm and Home Loan Program, as approved by Proposition 12, has been significantly undersubscribed. Five years since its passage, the full nine hundred million dollars (\$900,000,000) remains unspent as does a portion of the five hundred million dollars (\$500,000,000) from Proposition 32, which was approved by the voters in 2000.*

(h) *Meanwhile, the need of veterans for multifamily housing that is affordable, supportive, and transitional remains unmet and public and private resources available for these purposes remain underutilized.*

(i) *California voters should be granted the opportunity to restructure the Proposition 12 veterans' bond program to better respond to the housing needs as well as the changing demographics of the current veteran population.*

(j) *The Veterans Housing and Homeless Prevention Bond Act of 2014 will restructure six hundred million dollars (\$600,000,000) of the existing Proposition 12 bond moneys to allow for the construction and rehabilitation of multifamily housing for veterans and prioritize projects that align housing with services. Even with this restructuring of bond moneys, the act still preserves over half a billion dollars for the existing CalVet Farm and Home Loan Program.*

(k) *The Veterans Housing and Homeless Prevention Bond Act of 2014 will expand housing and service options for veterans, cost-effectively leverage public dollars, reduce the number of homeless veterans and its attendant public costs, and place California at the forefront of our nation's efforts to end veterans' homelessness by 2015.*

998.542. (a) *The State General Obligation Bond Law (Chapter 4 (commencing with Section 16720) of Part 3 of Division 4 of Title 2 of the Government Code), as amended from time to time, except as otherwise provided herein, is adopted for the purpose of the issuance, sale, and repayment of, and otherwise providing with respect to, the bonds authorized to be issued by this article, and the provisions of that law are included in this article as though set out in full in this article. All references in this article to "herein" refer both to this article and that law.*

(b) For purposes of the State General Obligation Bond Law, the Department of Veterans Affairs is designated the board. The Department of Veterans Affairs shall carry out the board duties in consultation with the California Housing Finance Agency and the Department of Housing and Community Development.

998.543. As used herein, the following terms have the following meanings:

(a) “Board” means the Department of Veterans Affairs.

(b) “Bond” means a veterans’ bond, a state general obligation bond, issued pursuant to this article adopting the provisions of the State General Obligation Bond Law.

(c) “Bond act” means this article authorizing the issuance of state general obligation bonds and adopting the State General Obligation Bond Law by reference.

(d) “Committee” means the Housing for Veterans Finance Committee, established pursuant to Section 998.547.

(e) “Fund” means the Housing for Veterans Fund, established pursuant to Section 998.544.

998.544. (a) Bonds in the total amount of six hundred million dollars (\$600,000,000), or so much thereof as is necessary, not including the amount of any refunding bonds, or so much thereof as is necessary, may be issued and sold to provide a fund to be used for carrying out the purposes expressed in subdivision (b) and to reimburse the General Obligation Bond Expense Revolving Fund pursuant to Section 16724.5 of the Government Code. The bonds, when sold, shall be and constitute a valid and binding obligation of the State of California, and the full faith and credit of the State of California is hereby pledged for the punctual payment of both principal of, and interest on, the bonds as the principal and interest become due and payable.

(b) The proceeds of bonds issued and sold pursuant to this section shall be made available to the board for the purposes of creating a fund to provide multifamily housing to veterans and their families pursuant to the Veterans Housing and Homeless Prevention Act of 2014 (Article 3.2 (commencing with Section 987.001)), and any subsequent statutory enactment that amends that act or enacts or amends any successor act for the purpose of providing housing to veterans and their families.

(c) The Legislature may, from time to time, by majority vote, amend the provisions of this act for the purpose of improving program efficiency, effectiveness, and accountability, or for the purpose of furthering overall program goals.

(d) The proceeds of bonds issued and sold pursuant to this article shall be deposited in the Housing for Veterans Fund, which is hereby created.

998.546. The bonds authorized by this article shall be prepared, executed, issued, sold, paid, and redeemed as provided in the State General Obligation Bond Law (Chapter 4 (commencing with Section 16720) of Part 3 of Division 4 of Title 2 of the Government Code), and all of the provisions of that law, except subdivisions (a) and (b) of Section 16727 of the Government Code, shall apply to the bonds and to this article and are hereby incorporated in this article as though set forth in full in this article.

998.547. Solely for the purpose of authorizing the issuance and sale pursuant to the State General Obligation Bond Law of the bonds authorized by this article, the Housing for Veterans Finance Committee is hereby created. For purposes of this article, the Housing for Veterans Finance Committee is “the committee” as that term is used in the State General Obligation Bond Law. The committee consists of the Controller, Treasurer, Director of Finance, Secretary of Business, Consumer Services, and Housing, and Secretary of Veterans Affairs, or their designated representatives. The Treasurer shall serve as chairperson of the committee. A majority of the committee may act for the committee.

998.548. The committee shall determine whether or not it is necessary or desirable to issue bonds authorized pursuant to this article in order to carry out the actions specified in Section 998.544 and, if so, the amount of bonds to be issued and sold. Successive issues of bonds may be authorized and sold to carry out those actions progressively, and it is not necessary that all of the bonds authorized to be issued be sold at any one time.

998.549. There shall be collected each year and in the same manner and at the same time as other state revenue is collected, in addition to the ordinary revenues of the state, a sum in an amount required to pay the principal of, and interest on, the bonds each year. It is the duty of all officers charged by law with any duty in regard to the collection of the revenue to do and perform each and every act that is necessary to collect that additional sum.

998.550. Notwithstanding Section 13340 of the Government Code, there is hereby appropriated from the General Fund in the State Treasury, for the purposes of this article, an amount that will equal the total of the following:

(a) The sum annually necessary to pay the principal of, and interest on, bonds issued and sold pursuant to this article, as the principal and interest become due and payable.

(b) The sum necessary to carry out Section 998.551, appropriated without regard to fiscal years.

998.551. For the purposes of carrying out this article, the Director of Finance may authorize the

41 withdrawal from the General Fund of an amount not to exceed the amount of the unsold bonds that have been authorized by the committee to be sold for the purpose of carrying out this article. Any amounts withdrawn shall be deposited in the fund. Any money made available under this section shall be returned to the General Fund

42 from proceeds received from the sale of bonds for the purpose of carrying out this article.

998.552. All money deposited in the fund that is derived from premium and accrued interest on bonds sold, in excess of any amount of premium used to pay costs of issuing the bonds, shall be reserved in the fund and shall be available for transfer to the General Fund as a credit to expenditures for bond interest.

998.553. Pursuant to Chapter 4 (commencing with Section 16720) of Part 3 of Division 4 of Title 2 of the Government Code, all or a portion of the cost of bond issuance may be paid out of the bond proceeds, including any premium derived from the sale of the bonds. These costs shall be shared proportionally by each program funded through this bond act.

998.554. The board may request the Pooled Money Investment Board to make a loan from the Pooled Money Investment Account, including other authorized forms of interim financing that include, but are not limited to, commercial paper, in accordance with Section 16312 of the Government Code, for purposes of carrying out this article. The amount of the request shall not exceed the amount of the unsold bonds that the committee, by resolution, has authorized to be sold for the purpose of carrying out this article. The board shall execute any documents required by the Pooled Money Investment Board to obtain and repay the loan. Any amounts loaned shall be deposited in the fund to be allocated by the board in accordance with this article.

998.555. The bonds may be refunded in accordance with Article 6 (commencing with Section 16780) of Chapter 4 of Part 3 of Division 4 of Title 2 of the Government Code, which is a part of the State General Obligation Bond Law. Approval by the voters of the state for the issuance of the bonds described in this article includes the approval of the issuance of any bonds issued to refund any bonds originally issued under this article or any previously issued refunding bonds.

998.556. Notwithstanding any other provision of this article, or of the State General Obligation Bond Law, the Treasurer may maintain separate accounts for the investment of bond proceeds and for the investment of earnings on those proceeds. The Treasurer may use or direct the use of those proceeds or earnings to pay any rebate, penalty, or other payment required under federal law or take any other action with respect to the investment and use of those bond proceeds required or

desirable under federal tax law or to obtain any other advantage under federal law on behalf of the funds of this state.

998.557. The Legislature hereby finds and declares that, inasmuch as the proceeds from the sale of bonds authorized by this article are not “proceeds of taxes” as that term is used in Article XIII B of the California Constitution, the disbursement of these proceeds is not subject to the limitations imposed by that article.

PROPOSITION 42

This amendment proposed by Senate Constitutional Amendment 3 of the 2013–2014 Regular Session (Resolution Chapter 123, Statutes of 2013) expressly amends the California Constitution by amending sections thereof; therefore, new provisions proposed to be added are printed in *italic type* to indicate that they are new.

PROPOSED AMENDMENTS TO SECTION 3 OF ARTICLE I AND SECTION 6 OF ARTICLE XIII B

First—That Section 3 of Article I thereof is amended to read:

SEC. 3. (a) The people have the right to instruct their representatives, petition government for redress of grievances, and assemble freely to consult for the common good.

(b) (1) The people have the right of access to information concerning the conduct of the people’s business, and, therefore, the meetings of public bodies and the writings of public officials and agencies shall be open to public scrutiny.

(2) A statute, court rule, or other authority, including those in effect on the effective date of this subdivision, shall be broadly construed if it furthers the people’s right of access, and narrowly construed if it limits the right of access. A statute, court rule, or other authority adopted after the effective date of this subdivision that limits the right of access shall be adopted with findings demonstrating the interest protected by the limitation and the need for protecting that interest.

(3) Nothing in this subdivision supersedes or modifies the right of privacy guaranteed by Section 1 or affects the construction of any statute, court rule, or other authority to the extent that it protects that right to privacy, including any statutory procedures governing discovery or disclosure of information concerning the official performance or professional qualifications of a peace officer.

(4) Nothing in this subdivision supersedes or modifies any provision of this Constitution, including the guarantees that a person may not be deprived of life, liberty, or property without due process of law, or denied equal protection of the laws, as provided in Section 7.

(5) This subdivision does not repeal or nullify, expressly or by implication, any constitutional or statutory exception to the right of access to public records or meetings of public bodies that is in effect on the effective date of this subdivision, including, but not limited to, any statute protecting the confidentiality of law enforcement and prosecution records.

(6) Nothing in this subdivision repeals, nullifies, supersedes, or modifies protections for the confidentiality of proceedings and records of the Legislature, the Members of the Legislature, and its employees, committees, and caucuses provided by Section 7 of Article IV, state law, or legislative rules adopted in furtherance of those provisions; nor does it affect the scope of permitted discovery in judicial or administrative proceedings regarding deliberations of the Legislature, the Members of the Legislature, and its employees, committees, and caucuses.

(7) *In order to ensure public access to the meetings of public bodies and the writings of public officials and agencies, as specified in paragraph (1), each local agency is hereby required to comply with the California Public Records Act (Chapter 3.5 (commencing with Section 6250) of Division 7 of Title 1 of the Government Code) and the Ralph M. Brown Act (Chapter 9 (commencing with Section 54950) of Part 1 of Division 2 of Title 5 of the Government Code), and with any subsequent statutory enactment amending either act, enacting a successor act, or amending any successor act that contains findings demonstrating that the statutory enactment furthers the purposes of this section.*

Second—That Section 6 of Article XIII B thereof is amended to read:

SEC. 6. (a) Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the State shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service, except that the Legislature may, but need not, provide a subvention of funds for the following mandates:

(1) Legislative mandates requested by the local agency affected.

(2) Legislation defining a new crime or changing an existing definition of a crime.

(3) Legislative mandates enacted prior to January 1, 1975, or executive orders or regulations initially implementing legislation enacted prior to January 1, 1975.

(4) *Legislative mandates contained in statutes within the scope of paragraph (7) of subdivision (b) of Section 3 of Article I.*

(b) (1) Except as provided in paragraph (2), for the 2005–06 fiscal year and every subsequent fiscal year, for a mandate for which the costs of a local government claimant have been determined in a preceding fiscal year to be payable by the State pursuant to law, the Legislature shall either appropriate, in the annual Budget Act, the full payable amount that has not been previously paid, or suspend the operation of the mandate for the fiscal year for which the annual Budget Act is applicable in a manner prescribed by law.

(2) Payable claims for costs incurred prior to the 2004–05 fiscal year that have not been paid prior to the 2005–06 fiscal year may be paid over a term of years, as prescribed by law.

(3) Ad valorem property tax revenues shall not be used to reimburse a local government for the costs of a new program or higher level of service.

(4) This subdivision applies to a mandate only as it affects a city, county, city and county, or special district.

(5) This subdivision shall not apply to a requirement to provide or recognize any procedural or substantive protection, right, benefit, or employment status of any local government employee or retiree, or of any local government employee organization, that arises from, affects, or directly relates to future, current, or past local government employment and that constitutes a mandate subject to this section.

(c) A mandated new program or higher level of service includes a transfer by the Legislature from the State to cities, counties, cities and counties, or special districts of complete or partial financial responsibility for a required program for which the State previously had complete or partial financial responsibility.

**SOLANO
City County Coordinating Council
Staff Report**

**Meeting of. May 8, 2014
Agenda Item No: V.2.**

Agency/Staff: Robert Macaulay, STA

Title /Subject: Draft Climate Action Plan Public Release

Review the Draft Climate Action Plans for the cities of Dixon, Fairfield, Rio Vista and Suisun City, and release them to the cities for review and action.

Background:

The cities of Benicia and Vallejo and the County of Solano have all independently developed inventories of Greenhouse Gas (GHG) emissions and Climate Action Plans (CAPs). The Solano Transportation Authority (STA)'s Board of Directors and the City-County Coordinating Council (4Cs) authorized the STA to work with the cities of Dixon, Fairfield, Rio Vista, Suisun City and Vacaville to develop their GHG inventories. These were completed in late 2011.

In the fall of 2011, the Pacific Gas and Electric Company (PG&E) notified STA that PG&E funds were available to assist in the development of a CAP focused on energy production and use, known as Energy Efficiency Climate Action Plan (EECAP). After discussions with the county Planning Directors and the 4Cs, STA applied for and received funding from PG&E for the development of the EECAPs.

In the spring of 2012, the STA received a grant from the California Strategic Growth Council (SGC) to prepare CAP materials for the non-energy sectors. The complete CAPs would be a combination of the PG&E and SGC supported documents. Final action on these documents would be the responsibility of each city.

In December of 2012, the EECAPs were provided to the cities of Dixon, Fairfield, Rio Vista and Suisun City. Each City Planning Commission considered the information in the draft ECCAP and sent it to the City Council, but recommended no action be taken until the complete document was prepared. The City of Vacaville was not included in the ECCAP or SGC process because they were preparing a comprehensive General Plan update that would include climate action planning.

Discussion:

STA's CAP consultant, AECOM, has completed the work of drafting the SGC-funded portion of the CAPs, and have provided them to staff for the four cities to review. Those documents have been finalized, and are ready for public release.

The CAPs recommend GHG reduction targets for each city, based upon the targets established by the state and the amount of emission reductions anticipated from state and regional efforts (such as low-carbon fuel standards), and then examine local actions that could be taken to reach those

goals. The draft emissions reduction measures were developed collaboratively among the participating cities to identify opportunities that appear to be consistent with existing local policies and that provide for regional implementation.

While the CAPs do define local actions that can be taken to achieve long-term emissions reduction goals, statewide actions provide the majority of reductions needed to achieve the near-term 2020 targets. This has allowed development of primarily voluntary local actions in the CAPs to demonstrate 2020 target achievement. The most important local actions with regards to achieving near-term targets include:

- Promotion of energy-efficiency retrofits through existing and new programs (e.g. Energy Upgrade California, Bay Area Renewable Energy Network, Solano Ygrene PACE program),
- Promotion of renewable energy development through existing and new programs (e.g., PG&E rebates, California Solar Initiative, Solano Ygrene PACE program) ,
- Infrastructure support for communitywide transition to alternative fuel vehicles (e.g., Compressed Natural Gas refueling station, pre-wiring for at-home electrical vehicle charging stations, communitywide recharging infrastructure), and
- Transportation Demand Management program per SB 1339 requirements.

Numerous other local actions play a supporting role in target achievement. Beyond the 2020 time horizon there may be a need for stronger local action to achieve the 2035 target. To that effect, longer-term strategies were also preliminarily analyzed to demonstrate a pathway towards future reduction targets (such as the CAPs' 2035 targets and the statewide 2050 target). These strategies focus on efforts that:

- Clean electricity sources used in Solano County (through statewide or local action),
- Support a fuller communitywide transition to alternative fuel vehicles, and
- Improve management of landfill methane emissions.

The STA and cities have sponsored several public workshops during the development of the CAPs. During these workshops, several points have been emphasized by staff:

- Adoption of CAPs at this time is voluntary. However, when a city updates its General Plan (as Vacaville has recently done), the environmental analysis must include GHG emissions, and reduction measures must be incorporated into the Plan.
- Many of the activities identified in the CAPs reduce GHG emissions and also save residents and businesses money by way of reduced energy consumption.
- All seven cities and the county can work together after the CAPs are adopted to implement the steps, thereby increasing efficiency and saving money.

The draft CAPs neither recommend nor require any specific projects be built. As a result, they can be adopted with a California Environmental Quality Act (CEQA) action of either a Categorical Exemption or a Negative Declaration. A Negative Declaration requires more analytical work to be done at this time, but allows future projects to reference that work. Future projects can reference compliance with the CAP and CAP measures to avoid project-specific CEQA analysis of GHG impacts. Each city will need to make its own decision regarding what sort of CEQA analysis to perform at this time.

Once released to the cities, each City must determine how to proceed with their draft CAPs. Since the City of Suisun City is preparing to update its General Plan, it is expected that the data and


recommendations from the draft CAP will be incorporated into their new General Plan, rather than being adopted separately. The other cities will determine the proper timing and format for consideration and, if desired, adoption of their CAP.

Recommendation:

Authorize the transmittal of the attached Draft Climate Action Plans to the cities of Dixon, Fairfield, Rio Vista and Suisun City for their subsequent review and action.

Attachments:

- A - City of Dixon Draft CAP
- B - City of Fairfield Draft CAP
- C - City of Rio Vista Draft CAP
- D - City of Suisun City Draft CAP



City of Dixon Climate Action Plan

Public Review Draft
April 2014



City of Dixon **Climate Action Plan**

Public Review Draft
April 2014

Prepared for:

City of Dixon

Consultant to the City:



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CHAPTER I

INTRODUCTION: PLANNING FOR CLIMATE CHANGE



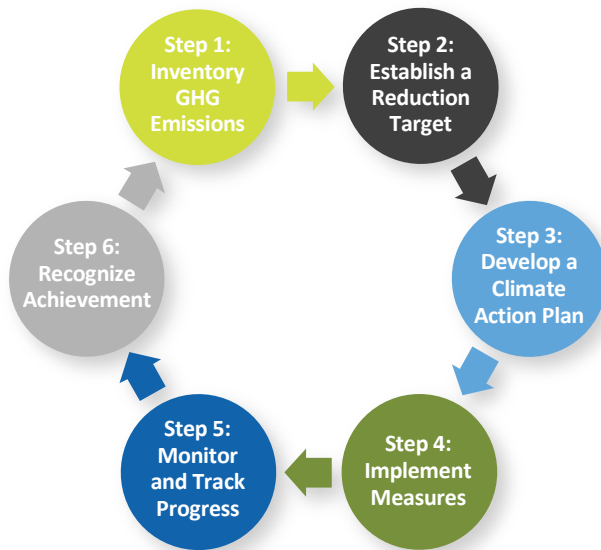
The State of California considers increasing greenhouse gas (GHG) emissions and resulting climate change impacts a major global challenge for the 21st century. According to most climatologists, the planet is starting to experience shifts in climate patterns and increased frequency of extreme weather events at both the global and local levels. At a statewide level, these impacts include reduced snow pack in the Sierra Nevada affecting California water supplies; rising sea levels threatening cities along the coast, San Francisco Bay, and Sacramento River; decreasing air quality affecting public health, particularly in the Central Valley; and, rising temperatures impacting the state's agricultural industry, including Solano County farmers and agricultural businesses.

This plan seeks to address these impacts by increasing local energy independence, improving building energy and water efficiency, supporting alternative transportation options, improving solid waste management, and establishing a regional framework for collaboration. This framework will build from the working relationships established during plan preparation to realize efficiencies in measure implementation among the various jurisdictions within Solano County.

What is a CAP?

A CAP (Climate Action Plan) is a tool that many cities in California are using to quantify their share of statewide GHG emissions and establish action steps toward achieving a local emissions reduction target. A CAP provides a set of strategies intended to guide community efforts to reduce GHG emissions, often through a combination of statewide and local actions. Figure 1.1 shows the typical steps included in the CAP development process.

Figure 1.1 – Steps in the CAP Development Process



A CAP contains community-specific GHG emission inventories and forecasts to establish a starting point and probable future emissions levels if no action is taken (Step 1). A reduction target is then defined to provide an aspirational goal for improvement (Step 2). Emission reduction measures and implementation programs are written to help the city meet its goal by achieving the reduction target (Step 3). Upon adoption of the CAP, the jurisdiction takes action to implement the reduction measures (Step 4), monitor their progress towards achievement of the reduction target (Step 5), then evaluate effectiveness, celebrate their successes, and use the monitoring results to make adjustments to CAP measures to improve performance (Step 6). This CAP represents the city’s progress on Steps 1-3, which are described in more detail below.

Purpose

The climate action planning process seeks to identify measures which are informed by the goals, values, and priorities of the community, while also contributing to the state’s climate protection efforts and complying with any applicable Air Quality District standards for GHG emissions. In addition, the CAP measures are intended to increase community resilience and efficiency of human / economic activities that consume resources which, in turn, lead to greenhouse gas emission (e.g., increasing local energy

independence, reducing transportation-related emissions, improving building energy and water efficiency, and extending the life of area landfills). The CAP can also support regional collaborations among local jurisdictions on climate change issues. There are also California Environmental Quality Act (CEQA) review streamlining benefits for development projects occurring within a jurisdiction that has an adopted CAP.

Context

Many local governments in California are using CAPs to quantify their share of statewide GHG emissions and establish action steps toward achieving a local emissions reduction target. Jurisdictions within Solano County already have a history of taking a leadership role in this area. The cities of Benicia and Vallejo and the County of Solano have already adopted climate action plans. In addition, the City of Vacaville released its Public Review Draft CAP in late 2013 for public review and comment. The City of Dixon's (city) efforts are complimentary to those already taken by its neighbors and are part of a regional effort described below.

CAPs typically address emissions targets through reduced dependency on fossil fuels and nonrenewable energy sources, increased energy and water efficiency, land use and technological changes that reduce transportation emissions, and improved waste management strategies. CAPs also provide a way to connect climate change mitigation (GHG reduction) to climate adaptation, community resilience, and broader community goals.

In Dixon, GHG emissions come from energy used in buildings, gasoline burned in motor vehicles and power equipment, water and wastewater treatment and conveyance, and solid waste disposal. Dixon's CAP examines the communitywide activities that result in GHG emissions and establishes strategies to help reduce those emissions in existing and future development through both voluntary and mandatory actions. The CAP also considers the local impact of federal and statewide actions to reduce GHG emissions.

In addition to reducing greenhouse gases, many of the strategies included in this plan will also help make Dixon a more attractive place to live – lowering energy and water bills through conservation, improving circulation through bike and pedestrian facility enhancements, improving air quality, and reducing waste generation to extend the lifetime of local landfills.

Process

This CAP was prepared as part of a Solano County regional-effort, involving the cities of Dixon, Fairfield, Rio Vista, and Suisun City (the participating cities). The intent of preparing this CAP through a regional collaborative process was to establish a common list of reduction measures so that no one jurisdiction would become economically (dis)advantaged through its CAP actions, and to find collaborative opportunities for plan implementation. To that end, the reduction measures contained within Chapter 3 were developed through a collaborative and simultaneous process among the participating cities. The previously adopted CAPs within the county were also reviewed during the measure development process to ensure countywide consistency to the extent possible.

FUNDING

PG&E GREEN COMMUNITIES PROGRAM

The four participating cities, along with the City of Vacaville, received funding through the Pacific Gas & Electric Company's (PG&E's) Green Communities Program to prepare energy efficiency climate action plans. These plans included many components of a full CAP, including evaluation of baseline emissions, future energy use forecasts, target setting, and the development of energy efficiency measures. These draft energy plans were presented to the Planning Commissions of each participating jurisdiction for their review and comment. The resulting information prepared during that effort has been incorporated throughout this full CAP.

STRATEGIC GROWTH COUNCIL PLANNING GRANT

The participating cities also received funding from the Strategic Growth Council (SGC) to develop the remaining non energy-related components of their CAP. This included preparing emissions forecasts for the transportation, solid waste, wastewater, and water sectors, as well as development of reduction measures targeting these sectors. This work was combined with the PG&E-funded draft energy plans to create a comprehensive CAP for each city.

Though similar in many ways, the participating cities each developed a customized CAP, relevant to their community's specific context.

PUBLIC STAKEHOLDER ENGAGEMENT

The project team kept the public, city staff, and elected officials informed and involved during the CAP development process. Stakeholder input was solicited at project milestones through a Regional Technical Advisory Committee (RTAC), at Solano City County Coordinating Council (4C's) meetings, community workshops, and Planning Commission presentations. See Table 1.1 for a list of the public stakeholder engagement activities.

RTAC

The Regional Technical Advisory Committee was formed during the project kick-off phase in June 2012 under the direction of the Solano Transportation Authority. City staff, local business community representatives, and regional agency staff were invited to participate in order to:

- + help gauge project feasibility and success
- + provide feedback on interim documents
- + help make project meaningful and beneficial for all communities
- + review, comment on, and discuss measures and implementation framework
- + support public outreach and future implementation efforts

The RTAC met nine times between June 2012 and October 2013. The first five meetings were committed to development of the PG&E-funded Energy Efficiency CAPs (EECAPs). The last four meetings focused on the SGC-funded portions of the CAPs, as well as

identification of regional implementation opportunities. Table 1.2 lists RTAC members who participated at various points of the CAP development process.

Table 1.1 Public Stakeholder Engagement Overview				
Meeting	Date	Location	Topic/Task	Stakeholders
STA/PGE EECAP Project Kickoff Workshop	June 13-14, 2012	STA Offices	Project kick off and policy gap analysis	City planners, Planning Commissions, City Councils
Community Workshop #1	July 12, 2012	Administration Center	Project kick-off; energy efficiency in participating cities	All
RTAC Meeting #1	July 24, 2012	STA Offices	RTAC kick-off; discuss policy gap analysis	RTAC members
4C's Meeting #1	August 9, 2012	Solano County Water Agency	Overview of project process	4C's Mayors and Supervisors
RTAC Meeting #2	August 28, 2012	STA Offices	Draft actions and measures (Energy)	RTAC members
RTAC Meeting #3	September 25, 2012	STA Offices	Administrative Draft Energy Efficiency CAPs	RTAC members
RTAC Meeting #4	October 23, 2012	STA Offices	Public Review Draft comments	RTAC members
RTAC Meeting #5	November 27, 2012	STA Offices	Planning Commission presentation preparation	RTAC members
Planning Commission Presentations – Energy Efficiency CAPs	November/ December 2012	Dixon, Fairfield, Rio Vista, and Suisun City	Present Draft Energy Efficiency CAPs; discuss next steps	City Planners, Planning Commissions, City Councils, Business Alliance
RTAC Meeting #6	April 16, 2013	STA Offices	Project kick-off for SGC-funded portion of CAPs; overview and schedule	RTAC members
4C's Meeting #2	May 9, 2013	Solano County Water Agency	Target setting and reduction gaps to be addressed by non-energy measures	4C's Mayors and Supervisors
RTAC Meeting #7	May 30, 2013	STA Offices	Preliminary measures list (non-energy), full emissions forecasts, targets and remaining reduction gaps	RTAC members
RTAC Meeting #8	June 18, 2013	STA Offices	Community workshop overview; regional implementation opportunities	RTAC members
Community Workshop #2	June 27, 2013	Solano County Events Center	Presentation of preliminary measures; participation activity to rank CAP measure options; community questionnaire	All
RTAC Meeting #9	October 22, 2013	STA Offices	Review draft measures and actions; discuss gap-filling measures to achieve targets	RTAC members
4C's Meeting #3	November 14, 2013	Solano County Water Agency	Progress report	4C's Mayors and Supervisors
4C's Meeting #4	March 13, 2014	Solano County Water Agency	Presentation of Public Review Draft CAPs	4C's Mayors and Supervisors

**Table 1.2
RTAC Members**

Name	Organization
Michael Neward	Bay Area Air Quality Management District
Alex Porteshawver	City of Benicia
Dave Dowswell	City of Dixon
Erin Beavers / David Feinstein / Brian Miller	City of Fairfield
Dave Melilli / John Degele	City of Rio Vista
John Kearns	City of Suisun City
Tyra Hays	City of Vacaville
Michelle Hightower	City of Vallejo
Dave Hunt	Gymboree
Chuck Rieger	Solano Center for Business Innovation
Matt Walsh	Solano County
Sandy Person	Solano Economic Development Corporation
Chris Lee / Any Floreno / David Okita	Solano County Water Agency
Mona Babauta	Soltrans Ride
Mathew Ehrhardt	Yolo Solano Area Air Quality Management District

4Cs

The Solano County Board of Supervisors and the mayors of the seven Solano County cities comprise the Solano City County Coordinating Council (CCCC) or “4Cs”, whose purpose is to improve countywide communication and coordination on issues of regional importance. The project team attended four meetings with the 4Cs to give CAP status updates and receive input to define the project’s regional approach.

PUBLIC WORKSHOPS

Two public workshops were held to gather community input on the initial list of CAP reduction measures. The workshops were open to all county residents and broadly advertised in local media, on STA’s website, and through email announcements distributed through local email lists from participating city staff. Flyers were also posted at the Solano County Administrative Center, where the workshops were held, and in downtown Fairfield. The first workshop in July 2012 focused on the energy efficiency plans, while the second in June 2013 included discussion of all emissions sectors. At both workshops, the public was encouraged to fill out a survey and talk to city staff representatives about the CAP specifics of each city. Even though some community members questioned the need to reduce GHGs, overall feedback for the effort to increase efficiencies was positive and the survey responses showed that many community members are already actively supporting resource conservation by composting and making efforts to conserve energy. PG&E staff attended the workshops to provide information on available energy efficiency programs and resources. The project team also presented an overview of the CAP planning process and facilitated a question and answer session. Community members were given another chance to comment at the Planning Commission and City Council meetings where the Draft Energy Efficiency CAPs (in 2012) and the Public Review Draft CAPs (in 2014) were presented.

Scope and Content of the Climate Action Plan

The CAP consists of four chapters: 1) Introduction: Planning for Climate Change; 2) Baseline Emissions Inventory, Forecasts, and Targets; 3) Emissions Reduction Measures; and 4) Benchmarks and Implementation. Appendices A through D provide additional detail on topics covered within the plan. The contents of each chapter and appendix are briefly described below.

- + **Chapter 1, Introduction: Planning for Climate Change**, describes the city's rationale for preparing a CAP, as well as the goals of the CAP to comply with local Air Quality Management District guidelines, as applicable. This chapter provides an overview of the topics covered in the CAP, presents conventional climate change science findings, and describes statewide actions to address climate change. This chapter also introduces the CAP's relationship to General Plan Environmental Impact Reports (EIRs), and its ability to enable a CEQA tool known as "tiering" to allow consistent future discretionary development projects to skip certain steps in the traditional CEQA process.
- + **Chapter 2, Baseline Emissions Inventory, Forecasts + Targets**, outlines key steps taken to develop the CAP, including preparing the 2005 baseline GHG inventory, forecasting future emissions for 2020 and 2035, and setting a near-term communitywide GHG reduction target for 2020 and a long-term target for 2035. This chapter also describes the emissions gap between the reduction targets and estimated statewide reductions.
- + **Chapter 3, Emissions Reduction Measures**, presents local measures developed for the five main reduction strategy areas: energy, transportation and land use, solid waste, water, and green infrastructure. This chapter provides a description of the reduction measure development process. Each local measure also includes a description of existing related programs and accomplishments, measure implementation actions, performance metrics against which to measure success, and estimated GHG reductions in 2020 and 2035.
- + **Chapter 4, Benchmarks and Implementation**, describes the process to monitor progress towards achieving the city's GHG reduction targets. This chapter identifies monitoring procedures, plan update processes, and other steps to ensure successful implementation.
- + **Appendix A – Emissions Inventory Methodology** provides a technical description of the methodology used to prepare for the 2005 emission inventory and 2020 and 2035 emissions forecasts.
- + **Appendix B – Target Setting Rationale** provides background information describing how the 2020 and 2035 reduction targets were selected.
- + **Appendix C – Emissions Reduction Quantification Methodology** provides assumptions used to determine the GHG emission reductions associated with statewide and local actions.
- + **Appendix D – Economic Analysis** presents documentation to support the measure implementation cost ranges included in Chapter 3.

Climate Change Science

According to the US Environmental Protection Agency, global warming refers to the recent and ongoing rise in global average temperature near Earth's surface, and is caused primarily by increasing concentrations of greenhouse gases in the atmosphere. Global warming is causing climate patterns to change. However, global warming itself represents only one aspect of climate change.

Climate change refers to any significant change in the measure of climate lasting for an extended period of time, including major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer.ⁱ

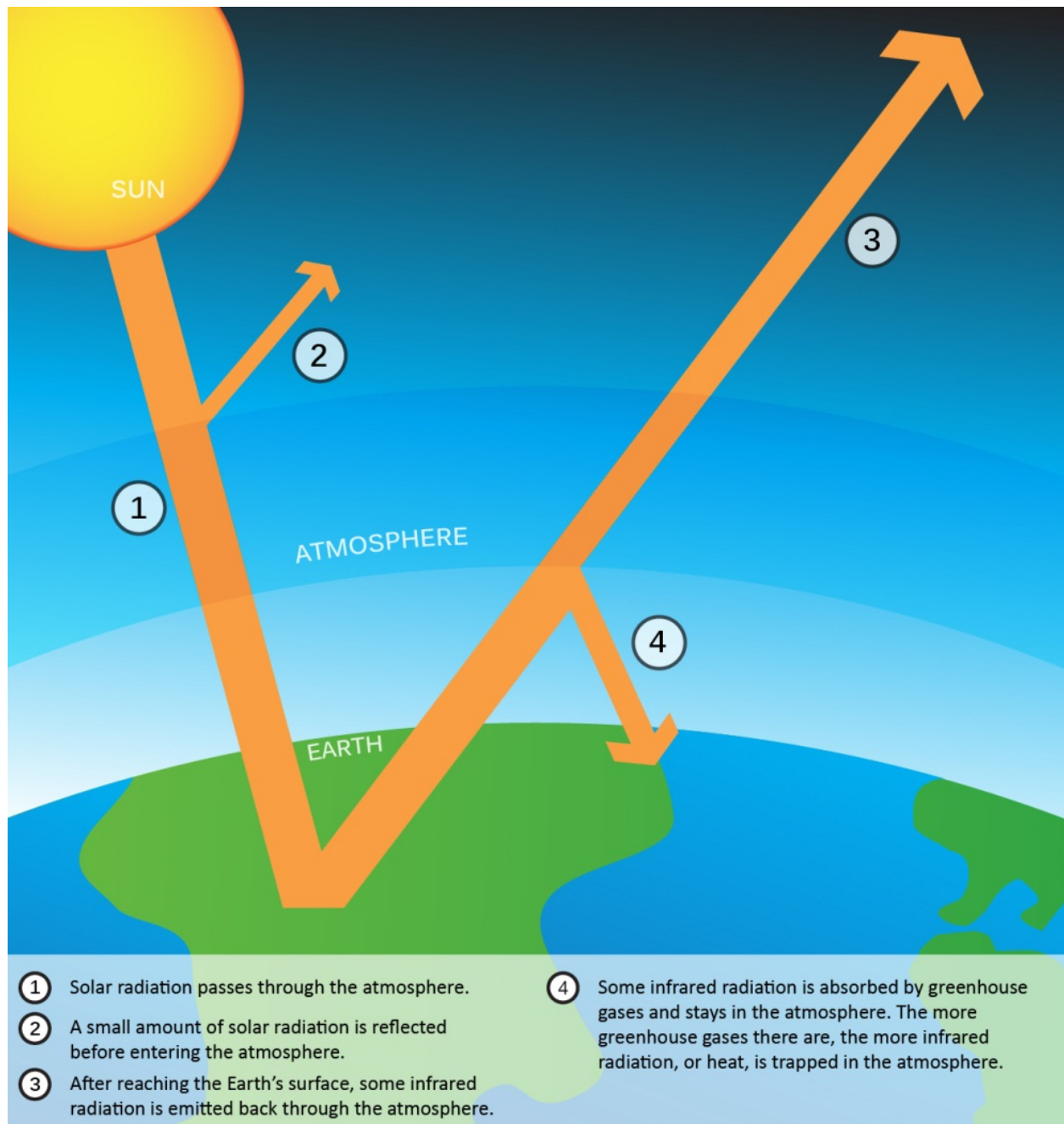
Over the past century, human activities have released large amounts of carbon dioxide (CO₂) and other greenhouse gases into the atmosphere. Greenhouse gases act like a blanket around Earth, trapping energy in the atmosphere and causing it to warm. This phenomenon is called the greenhouse effect and is natural and necessary to support life on Earth. However, the buildup of greenhouse gases can change Earth's climate and result in dangerous effects to human health and welfare and to ecosystems.ⁱⁱ Figure 1.2 provides a simple illustration of the greenhouse effect.

In the United States, 83.6% of GHG emissions are from CO₂, with 94.4% of CO₂ emissions coming from the burning of fossil fuels.ⁱⁱⁱ Trend projections indicate that atmospheric concentrations of GHG emissions will continue to increase throughout this century. If these projections become reality, climate change will threaten our economic well-being, public health, and environment.

California has an advantage in its scientific understanding of climate change and its local effects. A solid body of vital data is available to assist state and local leaders to better understand how climate change is affecting us now, what is in store ahead, and what we can do about it. State-sponsored research has played a major role in recent advances in our understanding of the potential impacts of climate change on California. A first assessment, published in 2006, made clear that the level of impact is a function of global greenhouse gas emissions and that lower emissions can significantly reduce those impacts.^{iv} The third and most recent publication, *The 2012 Vulnerability and Adaptation Study*, explores local and statewide vulnerabilities to climate change, highlighting opportunities for taking concrete actions to reduce climate-change impacts.^v

The California legislature passed legislation (addressed below) based upon the findings of the most comprehensive, advanced, and thoroughly reviewed documents on the science of climate change. The development of CAPs in California, including those in Solano County, is based upon the actions of the California legislature and its reliance on these findings. For further information on Climate Science, please visit the California Climate Change Portal at <http://www.climatechange.ca.gov/>.

Figure 1.2 – Greenhouse Effect



BENEFITS OF ADDRESSING GHG EMISSIONS

Planning efforts intended to reduce GHG emissions through resource efficiency and conservation measures often have multiple co-benefits as well that will improve the local quality of life. While some co-benefits are qualitative, others are quantifiable improvements over current conditions.

This plan references a list of co-benefits to illustrate the overlapping benefits of various CAP measures, though the list used is in no way exhaustive. Overall, these co-benefits:

- + Strengthen local economic development (e.g., CEQA streamlining/tiering, transparent development requirements)
- + Demonstrate regional sustainability leadership
- + Improve neighborhood experiences
- + Support climate change adaptation strategies and community resilience

The following co-benefits are identified in Chapter 3 next to the applicable local reduction measures:

- + Improves air quality
- + Reduced energy use
- + Promotes regional smart growth
- + Reduces traffic congestion
- + Reduces water use; extends community water supply
- + Improves water quality; reduces stormwater run-off
- + Improves local energy independence
- + Increases natural habitat
- + Reduces heat island effect
- + Improves public health
- + Creates local jobs
- + Reduces waste; extends landfill lifespan
- + Provides long-term savings to residents, businesses, and local governments
- + Raises community awareness

California Climate Change Actions

Dixon's strategy for climate protection, as one of eight local plans in the Solano County regional climate action planning effort, must be set within the context of the Bay Area and the State, where much of the momentum for local action in the United States originates.

California has long been a sustainability leader, as illustrated by Governor Schwarzenegger signing Executive Order (EO) S-3-05 in 2005. EO S-3-05 recognizes California's vulnerability to a reduced snowpack, exacerbation of air quality problems, and potential sea-level rise due to a changing climate. To address these concerns, the governor established targets to reduce statewide GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050.

In 2006, California became the first state in the country to adopt a statewide GHG reduction target, through the adoption of Assembly Bill 32 (AB 32). This law codifies the EO S-3-05 requirement to reduce statewide emissions to 1990 levels by 2020. AB 32 resulted in the California Air Resources Board (ARB) adoption of a *Climate Change Scoping Plan* (Scoping Plan) in 2008. The Scoping Plan outlines the state's plan to achieve emission reductions through a mix of direct regulations; alternative compliance mechanisms; and different types of incentives, voluntary actions, market based mechanisms, and funding. The Scoping Plan addresses similar areas to those contained in this CAP, including building energy efficiency, transportation, waste reduction, water conservation, and green infrastructure.

AB 32 engendered several companion laws that can assist Dixon in reducing communitywide GHG emissions to achieve its local target. These legislative actions and regulations are referred to as statewide actions throughout this plan, and represent a significant source of estimated GHG reductions. The CAP estimated GHG emission reductions associated with:

- + Renewable Portfolio Standard (RPS),
- + AB 1109 Lighting Efficiency
- + California 2013 Building Energy Efficiency Standards,
- + AB 1493 Pavley I and II
- + EO-S-1-07 Low Carbon Fuel Standard, and
- + Vehicle Efficiency Regulations.

As the regulatory framework surrounding AB 32 grows, it may be possible to evaluate a wider range of statewide reductions.

RENEWABLE PORTFOLIO STANDARD

Senate Bill (SB) 1078, SB 107, EO-S-14-08, and SB X1-2 have established increasingly stringent Renewable Portfolio Standard (RPS) requirements for California utilities. RPS-eligible energy sources include wind, solar, geothermal, biomass, and small-scale hydro.

- + **SB 1078** required investor-owned utilities to provide at least 20% of their electricity from renewable resources by 2020.
- + **SB 107** accelerated the SB 1078 timeframe to take effect in 2010.
- + **EO-S-14-08** increased the RPS further to 33% by 2020. PG&E, Dixon's electricity provider, delivered 12.1% of its electricity from RPS-eligible renewable sources in 2005 and 19% in 2011.
- + **SB X1-2** codified the 33% RPS by 2020 requirement established by EO-S-14-08.

AB 1109 – LIGHTING EFFICIENCY

AB 1109 was signed into law in 2007. The California Lighting Efficiency and Toxics Reduction Act requires the California Energy Commission to adopt energy efficiency standards for all general purpose lights, reducing lighting energy usage in indoor residences and state facilities by no less than 50%, by 2018, as well as require a 25% reduction in commercial facilities by that same date. To achieve these efficiency levels, the California Energy Commission applied its existing appliance efficiency standards to include lighting products, as well as required minimum lumen/watt standards for different categories of lighting products. In addition, the bill prohibits the manufacturing for sale or the sale of certain general purpose lights that contain hazardous substances.

2013 BUILDING ENERGY EFFICIENCY STANDARDS

California's Building Standards Code (California Code of Regulations Title 24) dictates how new buildings and major remodels are constructed in California. The Building Energy Efficiency Standards (Title 24, Part 6), are a subset of the state building code, which detail energy efficiency standards for residential and non-residential development. The standards are updated on an approximately three-year cycle. The state has further increased building energy conservation requirements through adoption of the 2013 standards, which go into effect July, 1 2014. It is estimated that these revisions to the current 2008 Building Energy Efficiency Standards will result in energy consumption reductions of 25% over the current standards.

The California Green Building Standards Code (California Code of Regulations Title 24, Part 11) includes additional requirements for new construction and renovation projects that may also result in emissions reductions. This plan does not include these reductions as a separate measure. However, the impact of these requirements may be accounted for in other statewide or local reduction measures (e.g., construction and demolition waste diversion requirements).

NET ZERO ENERGY NEW BUILDINGS

In the *2007 Integrated Energy Policy Report*, the CEC adopted a goal to achieve net zero energy buildings in new residential construction by 2020 and non-residential construction by 2030. A net zero energy building consumes only as much energy on an annual basis as can be generated with an on-site renewable energy system (e.g., solar, wind, geothermal). While the pathway to realize this goal has not yet been defined, this plan considers the future impact of this measure as part of an illustration to show what it will take to achieve the city's longer-term emissions reduction target (see Chapter 3 for further description).

AB 1493 – PAVLEY I AND II

AB 1493, California's mobile-source GHG emissions regulations for passenger vehicles, or California Clean Car Standards, was signed into law in 2002. AB 1493 requires ARB to develop and adopt regulations that reduce GHG emissions from passenger vehicles, light-duty trucks, and other non-commercial vehicles for personal transportation. In 2004, ARB approved amendments to the California Code of Regulations adding GHG emissions standards to California's existing standards for motor vehicle emissions.

EO-S-1-07 – THE LOW CARBON FUEL STANDARD

EO-S-01-07 reduces the carbon intensity of California's transportation fuels by at least 10% by 2020. The Low Carbon Fuel Standard (LCFS) is a performance standard with flexible compliance mechanisms that incentivizes the development of a diverse set of clean, low-carbon transportation fuel options to reduce GHG emissions.

VEHICLE EFFICIENCY REGULATIONS

ARB has adopted several regulations to reduce emissions through improved vehicle efficiency that will have local GHG emission reduction benefits in Dixon. The following two regulations were quantified and included as part of this CAP.

TIRE INFLATION REGULATION

On September 1, 2010, ARB's Tire Pressure Regulation took effect. The purpose of this regulation is to reduce GHG emissions from vehicles operating with under-inflated tires by inflating them to the recommended tire pressure rating. The regulation applies to vehicles with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. Under this regulation, automotive service providers must meet the following requirements:

- + Check and inflate each vehicle's tires to the recommended tire pressure rating, with air or nitrogen, as appropriate, at the time of performing any automotive maintenance or repair service.
- + Indicate on the vehicle service invoice that a tire inflation service was completed and the tire pressure measurements after the service were performed.
- + Perform the tire pressure service using a tire pressure gauge with a total permissible error no greater than + two (2) pounds per square inch (psi).
- + Have access to a tire inflation reference that is current within three years of publication.
- + Keep a copy of the service invoice for a minimum of three years, and make the vehicle service invoice available to the ARB, or its authorized representative upon request.

HEAVY-DUTY VEHICLE GHG EMISSION REDUCTION (AERODYNAMIC EFFICIENCY)

This regulation requires existing trucks/trailers to be retrofitted with the best available technology and/or ARB-approved technology to increase vehicle aerodynamics and fuel efficiency that will result in GHG reductions. This measure has been identified as a Discrete Early Action in the Scoping Plan, which means it must be enforceable beginning in 2010. Technologies that reduce GHG emissions and improve the fuel efficiency of trucks may include devices that reduce aerodynamic drag and rolling resistance. These requirements apply to both California-registered trucks and out-of-state registered trucks that travel to California.

SB 375

The Sustainable Communities and Climate Protection Act of 2008 (SB 375) was adopted to support statewide GHG reduction efforts through coordinated transportation and land use planning. SB 375 seeks to:

- + Use the regional transportation planning process to help achieve AB 32 goals.
- + Use CEQA streamlining as an incentive to encourage transit-oriented residential projects that help achieve AB 32 goals.
- + Coordinate the regional housing needs allocation process with the regional transportation planning process, providing monetary incentives for sustainable development.

Under SB 375, ARB set regional targets for GHG emissions reductions from passenger vehicle use. In 2010, ARB established these targets for 2020 and 2035 for each region covered by one of the State's Metropolitan Planning Organizations (MPO). Each of California's MPOs must prepare a "sustainable communities strategy" (SCS) as an integral part of its regional transportation plan. The SCS contains land use, housing, and transportation strategies that, if implemented, would allow the region to meet its GHG emission reduction targets. The Metropolitan Transportation Commission (MTC) is the MPO for nine Bay Area counties, including Solano County. As such, MTC developed *Plan Bay Area* as its long-range integrated land use and housing strategy, and includes the region's SCS and RTP.

This CAP was developed using household and employment projections from *Plan Bay Area* as well as future travel demand for 2020 and 2035 from MTC's transportation model to provide consistency between the CAP and the SCS. While there are no discrete SB 375 emissions reductions included in the CAP, the transportation emission forecasts were developed using modeled travel data from the SCS, thereby incorporating compliance with SB 375 into the CAP.

Relationship to the General Plan

Whether by local desire, guidance from the State of California, or both, cities and counties are increasingly addressing climate change in their General Plans through the inclusion of policies and programs that have a co-benefit of reducing GHG emissions. The city's policy commitment includes encouraging higher density, mixed-use and infill development in appropriate locations, energy efficiency, and renewable energy development that contribute to GHG reduction strategies contained in the CAP. Since GHG emissions are a cross-cutting issue addressed by many General Plan elements, the CAP as a whole is generally considered an implementation measure for the General Plan. This structure allows the city to update the CAP on an ongoing, as-needed basis to ensure that their climate protection efforts reflect both current legislation and emerging best practices.

In addition, several state agencies have provided guidance and case studies for local governments to address climate change in their General Plans. For example:

- + Since 2008, the California Attorney General's office has provided guidance to local governments on addressing climate change and greenhouse gas reduction through General Plan policies.
- + The California Office of Planning and Research (OPR) is preparing an update to the state's *General Plan Guidelines* that will include guidance for GHG emissions reduction and climate adaptation.
- + The California Natural Resources Agency has released a Climate Adaptation Policy Guide for local governments.
- + The California Department of Housing and Community Development has released a guidance document on General Plan housing element policies and programs addressing climate change with case study examples.
- + The Office of Planning and Research prepared a guidance document for addressing complete streets in General Plans as required by AB 1358.

Relationship to the California Environmental Quality Act

Local governments may prepare a Plan for Reduction of Greenhouse Gases that is consistent with AB 32 goals. By preparing such a plan, the city can streamline CEQA review of subsequent plans and projects consistent with the GHG reduction strategies and target in the plan. To meet the standards of a qualified GHG reduction plan, Dixon's CAP must achieve the following criteria (which elaborate upon criteria established in State CEQA Guidelines Section 15183.5[b][1]):

- + Complete a baseline emissions inventory and project future emissions
- + Identify a community-wide reduction target
- + Prepare a CAP to identify strategies and measures to meet the reduction target
- + Monitor effectiveness of reduction measures and adapt the plan to changing conditions
- + Adopt the CAP in a public process following environmental review

This approach allows jurisdictions to analyze and mitigate the significant effects of GHGs at a programmatic level, by adopting a plan for the reduction of GHG emissions. Later, as individual projects are proposed, project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review in their cumulative impacts analysis. Project-specific environmental documents prepared for projects consistent with the CAP may rely on the programmatic analysis of GHGs contained in the CAP's corresponding CEQA document. Chapter 4 provides a discussion

of the criteria and process the city will use to determine if a future project is consistent with the CAP.

A project-specific environmental document that relies on this CAP for its cumulative impacts analysis must identify specific CAP measures applicable to the project, and how the project incorporates the measures. If the measures are not otherwise binding and enforceable, they must be incorporated as mitigation measures applicable to the project. If substantial evidence indicates that the GHG emissions of a proposed project may be cumulatively considerable, notwithstanding the project's compliance with specific measures in this CAP, an EIR must be prepared for the project.

Notes

ⁱ US Environmental Protection Agency. Climate Change Basics. Accessed December 4, 2012. Available at: <http://www.epa.gov/climatechange/basics/>.

ⁱⁱ Ibid.

ⁱⁱⁱ US Environmental Protection Agency. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010. April 15, 2012. Accessed December 4, 2012. Available at: <http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html>.

^{iv} California Climate Change Center. Our Changing Climate – Assessing the Risks to California: A Summary Report from the California Climate Change Center. August 2006. Accessed December 4, 2012. Available at: <http://www.energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2006-077>.

^v California Climate Change Center. Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California. July 2012. Accessed December 4, 2012. Available at: <http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf>.

CHAPTER 2

EMISSIONS INVENTORY, FORECASTS + TARGETS

2

This chapter examines Dixon's current and future communitywide greenhouse gas (GHG) emissions. It outlines the first few steps of the CAP development process, including preparing the 2005 baseline GHG inventory, forecasting future emissions for 2020 and 2035, and setting communitywide GHG reduction targets. These first steps are the foundation upon which locally appropriate reduction measures were later developed. This chapter also presents estimated reductions resulting from statewide actions, and compares their impact to Dixon's emissions reduction targets. This comparison frames the reductions gap, which is then addressed through local CAP measures described in Chapter 3.

Baseline Inventory (2005)

The purpose of a baseline inventory is to provide a snapshot of communitywide GHG emissions in a given year. A baseline inventory allows the city to identify major sources of emissions within the community, and then develop meaningful reduction measures that address the major emissions contributors. The city developed its baseline emissions inventory for the 2005 operational year as part of a countywide climate action planning effort in 2011. Although Dixon is located within the Yolo Solano Air Quality Management District's (YSAQMD) jurisdictional boundary, at the time of this analysis, YSAQMD had not developed specific GHG inventory guidance. As a result, the City of Dixon's inventory was calculated to be consistent with the Bay Area Air Quality Management District's (BAAQMD) GHG Plan Level Quantification Guidance. This approach allowed all of the jointly-prepared GHG inventories and CAPs (i.e., Dixon, Fairfield, Rio Vista, and Suisun City) to be developed in a consistent manner. See Appendix A for the emissions inventory methodology.

EMISSIONS SECTORS

The baseline inventory organizes emissions into categories, or sectors, based on the emissions sources. Dixon's inventory includes emissions from the following sectors:

- + Energy (electricity and natural gas)
- + Transportation
- + Solid Waste
- + Off-Road Equipment
- + Potable Water
- + Wastewater

Energy

In general, energy emissions are generated through the combustion of fossil fuels to generate electricity or directly provide power (e.g., natural gas combustion for water heating). The energy sector includes the use of electricity and natural gas in residential, commercial, and industrial land uses within the legal boundaries of the city. Although emissions associated with electricity production are likely to occur in a different jurisdiction, the emissions are considered to be measured at the point of use and not the point of generation. Consumers are thus considered accountable for the generation of those emissions. Electricity-related GHG emissions are considered indirect emissions. Indirect emissions are those that are generated as a result of activities occurring within the jurisdiction, but occur in different geographic areas. For example, a Dixon resident may consume electricity within the city, but the electricity may be generated in a different region. Direct emissions are those where the consumption activity directly generates the emissions, such as natural gas combustion for heating or cooling.

The Pacific Gas and Electric Company (PG&E) provides electricity and natural gas to all cities within Solano County, and provided electricity and natural gas consumption data to develop the baseline inventory. PG&E provided all electricity and natural gas consumption data in the form of kilowatt-hours per year (kWh/yr) and therms per year (therms/yr), respectively. Electricity-related GHG emissions were quantified using a

PG&E-specific emission factor that accounts for PG&E's 2005 electricity production portfolio (e.g., the mix of coal, oil, wind, solar and other sources of electricity production). Natural gas GHG emissions were also quantified using a PG&E-specific natural gas emissions factor.

Transportation

Transportation emissions come from vehicle trips that begin and/or end within Dixon's boundaries. Pass through trips (for example, non-local drivers on Interstate 80) are not included within Dixon's emissions inventory because the CAP measures would not affect those emissions. This sector includes GHG exhaust emissions from both private vehicles and city-owned vehicles. Unlike most of the other emissions sectors where activity data is available to more precisely calculate actual resource consumption (e.g., electricity used, wastewater generated, solid waste disposed), the transportation sector relies upon travel models to estimate vehicle use within a community. Travel models estimate the total vehicle miles traveled (VMT) within a community, which can then be combined with vehicle fuel emissions factors to estimate transportation-related emissions.

For this CAP, VMT data were acquired from the new Metropolitan Transportation Commission (MTC) activity-based travel model. This model provides VMT data separated by trip origin and destination. The VMT associated with vehicle trips that would originate or terminate within the city were attributed to the city's transportation sector. The MTC model also provides commercial vehicle VMT within a jurisdiction, though calculated differently than the passenger vehicle trips.

Emission factors for the transportation sector were obtained from the California Air Resources Board's (ARB) vehicle emissions model, EMFAC2007. EMFAC2007 is a mobile source emission model for California that provides vehicle emission factors by both county and vehicle class. Solano County-specific emission factors were used in this emissions inventory.

Solid Waste

The solid waste sector includes emissions associated with solid waste disposal. During the solid waste decomposition process, only organic materials release GHGs. Carbon dioxide emissions are generated under aerobic conditions (i.e., in the presence of oxygen), such as when composting. Methane (CH₄) and CO₂ emissions are generated under anaerobic conditions (i.e., in the absence of oxygen), as in many landfill environments. Waste collection and hauling activities also generate GHG exhaust emissions. However, hauling-related emissions are assumed to be included within the MTC commercial vehicle model and represented within the transportation sector.

Solid waste generated within the city is primarily sent to the Hay Road landfill. Annual tons of solid waste generated by land uses and waste categorization data were provided by city staff and CalRecycle. The first-order-decay method was used to estimate methane landfill emissions to incorporate the time factor of the solid waste degradation process, which can take decades to occur.

Off Road Equipment

Off-road equipment emissions can come from local construction and mining activities, operation of lawn and garden equipment (e.g., lawn mowers, leaf blowers), and use of light commercial/industrial equipment (e.g., backhoes, forklifts).

Data for construction, mining, light commercial, industrial, and lawn and gardening equipment were obtained from ARB's OFFROAD2007 model, which provides county-level emissions factors for off-road equipment. OFFROAD2007 provides total off-road equipment emissions by county, so applicable indicators specific to Dixon were used to allocate the city's share of total county-wide emissions (e.g., building permits, households, retail jobs). Similar to the transportation sector, these emissions are modeled and not based on specific activity data.

Potable Water

The potable water sector includes energy emissions associated with water treatment, distribution, and conveyance. Water consumption data was provided by city staff. The California Energy Commission's water-energy intensity studies were used to calculate the amount of electricity required to provide potable water. GHG emissions associated with potable water supply were then calculated using statewide electricity intensity factors.

Wastewater

The wastewater sector includes emissions resulting from wastewater treatment processes and from energy used to power wastewater treatment plants. City staff provided the total amount of wastewater sent to the Dixon Wastewater Treatment Plant from land uses within the city, as well as specific wastewater treatment factors, such as nitrogen content of effluent.

The 2006 International Panel on Climate Change (IPCC) *Guidelines for National Greenhouse Gas Inventories* was used to quantify CH₄ and nitrous oxide (N₂O) emissions resulting from wastewater treatment processes. Generation of both types of emissions depend on the amount of annual throughput (i.e., volume of wastewater), as well as characteristics of the wastewater itself and treatment plant management processes. Energy-related GHG emissions associated with wastewater treatment facility operation were removed from this sector to avoid double counting with the energy sector.

UNITS OF MEASUREMENT

Emissions inventories are commonly expressed in metric tons (or tonnes) of carbon dioxide equivalent per year (MT CO₂e/yr) to provide a standard measurement that incorporates the varying global warming potentials (GWP) of different greenhouse gases. GWP describes how much heat a greenhouse gas can trap in the atmosphere relative to carbon dioxide, which has a GWP of 1. For example, methane has a GWP of 25, which means that 1 metric ton of methane will trap 25 times more heat than 1 metric ton of carbon dioxide, making it a more potent greenhouse gas. Some gases used in industrial applications can have a GWP thousands of times larger than that of CO₂. See Table 2.1 for a sample of common greenhouse gases and their global warming potential.

**Table 2.1
Greenhouse Gases and Global Warming Potential**

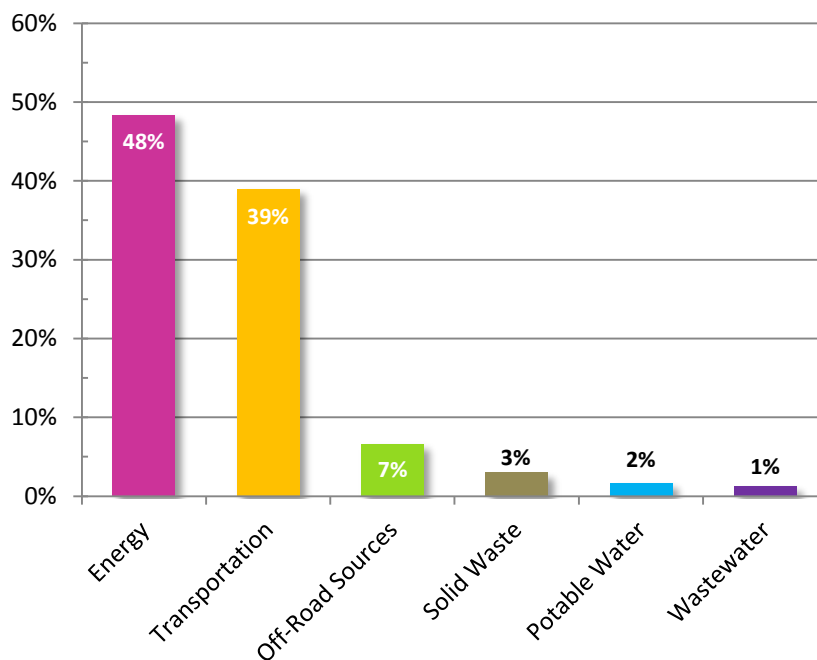
Common Name	Chemical Formula	Global Warming Potential (100-yr)
Carbon Dioxide	CO ₂	1
Methane	CH ₄	25
Nitrous Oxide	N ₂ O	298
Tetrafluoromethane (PFC-14)	CF ₄	7,390
Fluoroform (HFC-23)	CHF ₃	14,800
Sulfur Hexafluoride	SF ₆	22,800

Source: IPCC Fourth Assessment Report, Climate Change 2007¹

BASELINE INVENTORY

Dixon’s baseline emissions inventory totals 98,501 MT CO₂e/yr in 2005. As shown in Figure 2.1, energy use is the largest contributor of GHG emissions in the city (48%), with transportation emissions contributing the majority of the remainder (39%). The energy and transportation sectors account for approximately 87% of total emissions, suggesting that local reduction efforts should focus on these areas. Off-road sources provide 7% of the inventory, and solid waste emissions provide another 3%. Potable water use and wastewater treatment are both small contributors by comparison, making up the remaining 3% of the inventory. See Table 2.2 for the total emissions from each sector.

Figure 2.1 – 2005 Baseline Emissions by Sector



**Table 2.2
2005 Communitywide Emissions**

Emission Sector	Subsector	Emissions (MT CO₂e/year)	Communitywide Total (%)
Energy		47,660	48.4%
<i>Electricity Subtotal</i>		<i>23,180</i>	<i>23.5%</i>
	Residential	10,374	10.5%
	Commercial	12,806	13.0%
<i>Natural Gas Subtotal</i>		<i>24,480</i>	<i>24.9%</i>
	Residential	12,441	12.6%
	Commercial	12,039	12.2%
Transportation		38,443	39.0%
	Passenger Vehicles	31,088	31.6%
	Commercial Vehicles	7,354	7.5%
Off-Road Sources		6,475	6.2%
Solid Waste		3,000	3.0%
Potable Water	Water Demand	1,680	1.7%
Wastewater	Wastewater Treatment	1,243	1.3%
Total		98,501	100.0%

Source: AECOM 2013

Note: Columns may not total 100% due to rounding

EMISSIONS FORECASTS – 2020 AND 2035

The baseline inventory was used to project the future communitywide GHG emissions under a business-as-usual (BAU) scenario. Dixon’s GHG emissions were forecast for the years 2020 and 2035, assuming that historic trends describing energy and water consumption, travel, and solid waste generation will remain the same in the future. Therefore, emissions forecasts demonstrate what emissions levels are likely to be under a scenario in which no statewide or local actions are taken to curtail emissions growth.

BAU emission forecasts provide insight regarding the scale of reductions necessary to achieve an emissions target before considering reductions likely to result from federal and statewide actions (e.g., vehicle efficiency standards), inherent technological advancements (e.g., energy-efficient appliances, lighting technology), or new voluntary or mandatory conservation efforts (e.g., landscape irrigation restrictions). The BAU emission forecasts also do not anticipate new sources of emissions or increased consumption rates in existing sectors. For example, as use of personal electronics, such as smartphones and tablets, increases emissions from electricity plug-load may also increase. Therefore, the only variable influencing the BAU forecasts is projected population and employment growth within the city.

The BAU forecasts use population and employment growth assumptions established by ABAG in support of Plan Bay Area. For the transportation sector, MTC provided future VMT activity levels using assumptions consistent with the VMT obtained for the baseline year. The 2020 forecast year aligns with the AB 32 target year, while the 2035 forecast year aligns with the SB 375 planning horizon. These forecasts have been developed for

planning purposes, and due to the complexity of each emissions sector and the uncertainty of future population and employment growth within the city, are subject to change. Therefore, as the 2020 and 2035 horizon years approach, the city will reevaluate its emissions projections to incorporate additional data points from periodic emissions inventories and revised city growth estimates. Regular emissions inventory updates will also help to assess progress towards the reduction targets, allowing the city to make revisions to CAP measures as necessary.

Table 2.3 shows Dixon’s communitywide emission forecasts by sector for 2020 and 2035. Communitywide emissions are forecast to increase by approximately 7,565 MT CO₂e/yr (7.7%) between 2005 and 2020, and by approximately 15,175 MT CO₂e/yr (15.4%) between 2005 and 2035. See Appendix A for details regarding the emissions forecast methodology.

Table 2.3 Communitywide Emissions 2005-2035					
Emission Sector	2005 Emissions (MT CO ₂ e/yr)	2020 Emissions (MT CO ₂ e/yr)	Increase from 2005 (%)	2035 Emissions (MT CO ₂ e/yr)	Increase from 2005 (%)
Energy	47,660	49,905	4.7%	52,151	9.4%
<i>Electricity Subtotal</i>	<i>23,180</i>	<i>24,272</i>	<i>4.7%</i>	<i>25,364</i>	<i>9.4%</i>
Residential	10,374	10,862	4.7%	11,351	9.4%
Commercial	12,806	13,410	4.7%	14,013	9.4%
<i>Natural Gas Subtotal</i>	<i>24,480</i>	<i>25,633</i>	<i>4.7%</i>	<i>26,787</i>	<i>9.4%</i>
Residential	12,441	13,027	4.7%	13,613	9.4%
Commercial	12,039	12,606	4.7%	13,174	9.4%
Transportation	38,443	42,535	10.6%	46,914	22.0%
Passenger Vehicles	31,088	34,007	9.4%	37,419	20.4%
Commercial Vehicles	7,354	8,528	16.0%	9,495	29.1%
Off-Road Sources	6,475	6,780	4.7%	7,085	9.4%
Solid Waste	3,000	3,784	26.1%	4,327	44.2%
Potable Water	1,680	1,759	4.7%	1,839	9.4%
Wastewater	1,243	1,302	4.7%	1,360	9.4%
Total	98,501	106,066	7.7%	113,676	15.4%

Source: AECOM 2013

Note: Columns may not total 100% due to rounding

Impact of Statewide Actions

Most of Dixon’s anticipated emission reductions will come from statewide actions intended to help the state achieve its long-term emissions reduction goals. These actions are being applied throughout California, such as the state’s building energy efficiency standards, and their local impact can be quantified to estimate Dixon’s share of these reductions. This CAP assumes that local emissions within the energy and transportation sectors will be reduced through the statewide efforts described in Chapter 1. This includes regulations addressing the use of renewable energy sources, energy efficiency, and GHG emissions from passenger cars and trucks. When the impact of these statewide actions is applied to Dixon’s BAU emission forecast, the resulting adjusted business-as-usual (ABAU) emissions levels begin to show progress towards future reduction targets.

This CAP also considers PG&E’s future mix of electricity generation sources as planned through 2020, though this is not specifically a statewide action. In addition to its compliance with the state’s Renewable Portfolio Standard (RPS), PG&E also anticipates that the non-RPS compliant portion of its portfolio will become cleaner as their use of natural gas increases and that of coal decreases. Natural gas releases less CO₂ than coal when burned, which will result in a de-carbonization of PG&E’s electricity generation portfolio as this shift is implemented.

As part of future CAP updates, the city will monitor the effectiveness of state legislation to ensure that the anticipated level of reductions is achieved locally, and to ensure that all applicable statewide reductions are included.

The CAP includes locally-realized emissions reductions from:

- + SB 1078 (Renewable Portfolio Standard) + PG&E’s de-carbonization estimates
- + AB 1109 (Lighting Efficiency)
- + California Title-24 Building Energy Efficiency Standards
- + AB 1493 (Pavley I and II)
- + EO-S-1-07 (Low Carbon Fuel Standard)
- + Vehicle Efficiency Regulations

Including only these statewide initiatives towards the GHG reduction targets is considered a conservative approach because ARB’s Scoping Plan describes numerous other actions that will result in statewide emissions reductions. The actions included herein represent those for which a methodology is available to calculate Dixon’s likely share of these reductions. Other actions will provide statewide benefits, but cannot be accurately attributed to Dixon at this time, and have therefore been omitted from the CAP’s calculation of statewide actions.

Table 2.4 summarizes the anticipated reductions associated with these statewide actions in years 2020 and 2035. Figure 2.2 shows the trajectory of the BAU and ABAU emissions forecasts from baseline year 2005.

Table 2.4
2020 and 2035 Emission Reductions from Statewide Actions

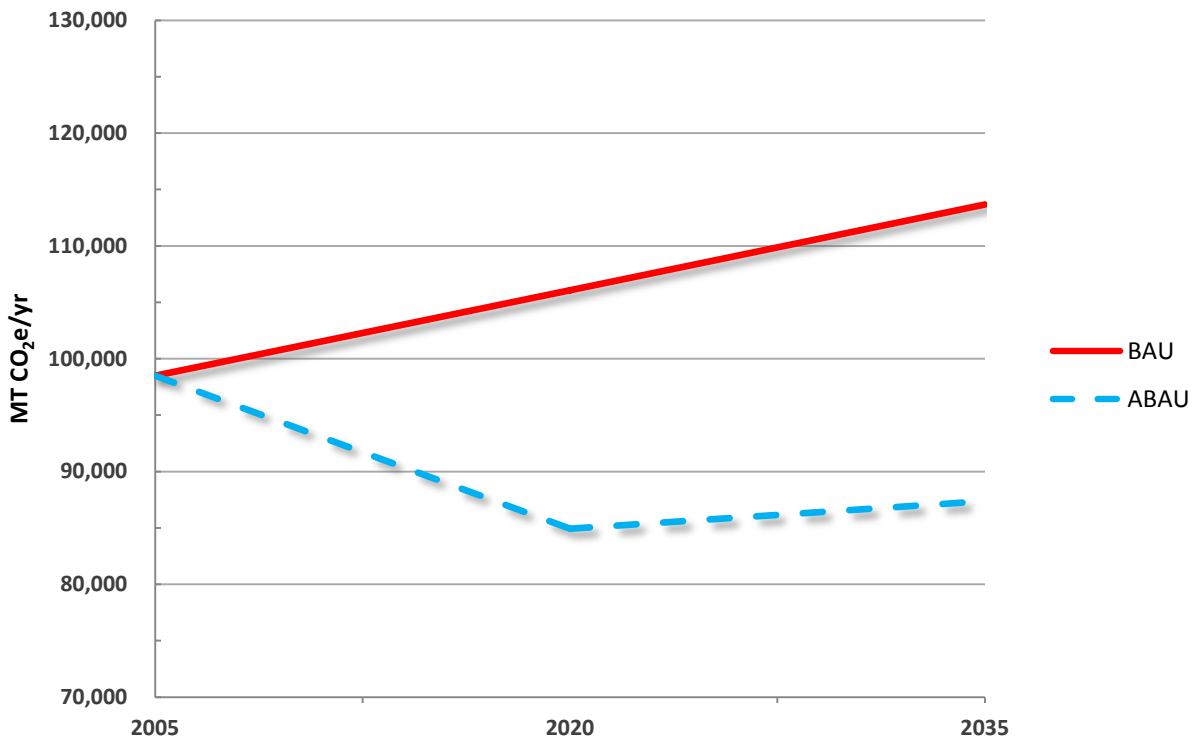
State or Federal Action	2020 Reduction (MT CO ₂ e/year)	2035 Reduction (MT CO ₂ e/year)
Renewable Portfolio Standard (33% by 2020) + PG&E De-carbonization	9,966	10,415
AB 1109 Lighting Efficiency	1,048	1,048
2013 California Building Energy Efficiency Standards	126	-1
Zero Net Energy Buildings Goal	-2	506
Pavley I and II	7,108	11,548
Low Carbon Fuel Standard	2,712	2,603
Vehicle Efficiency Regulations	167	184
Total	21,127	26,304

Source: AECOM 2013

¹ Reductions from 2013 Building Energy Efficiency Standards are replaced in 2035 with the CEC's Zero Net Energy Buildings Goal to avoid double counting emissions reductions with overlapping statewide actions;

² The CEC's Zero Net Energy Buildings Goal is intended to take effect beginning in 2020 for residential buildings and 2030 for nonresidential buildings.

Figure 2.2 – Business as Usual (BAU) and Adjusted Business as Usual (ABAU) Emissions



Emission Reduction Targets

The purpose of a reduction target is to enable the city to achieve future GHG emissions reductions in a manner that supports statewide efforts, and complies with recent revisions to the California Environmental Quality Act (CEQA) guidelines to allow CEQA streamlining benefits. See Appendix B for a further description of the target setting rationale presented here.

MASS EMISSIONS AND EFFICIENCY THRESHOLDS

Targets can be expressed as either mass emissions reductions or efficiency thresholds. Mass emissions targets establish an absolute emissions level to be achieved by a target year, such as 100,000 MT CO₂e/yr by 2020. Typically, mass emissions targets are expressed as a percent below the emissions level of some baseline year, such as 15% below 2005 by 2020. Alternatively, efficiency thresholds set a target level of emissions per population or per service population (i.e., population plus local jobs), such as 6.6 MT CO₂e/SP/yr. Efficiency thresholds demonstrate a city's ability to grow population and employment, while emissions shrink on a per unit basis; in effect, a city could be growing more efficiently from an emissions standpoint. In this case, total emissions within a city may increase while still achieving an efficiency target, as long as service population is growing faster than emissions. Both types of targets are useful to consider when selecting an appropriate emissions reduction target for a community.

It is anticipated that the Governor's Office of Planning and Research will provide future guidance regarding preparation of plans for the reduction of GHG emissions. This guidance may identify mass emissions reduction targets as preferable to the use of efficiency metrics at the communitywide planning level, in order to ensure that each jurisdiction in California makes progress towards actual mass emissions reductions. However, at the time of this CAP's preparation there was no state-level guidance requiring local governments to adopt specific reduction targets.

TARGET SETTING CONSIDERATIONS

The city considered a range of GHG emission reduction targets during plan preparation. In making its target selection, the city weighed numerous factors, such as:

- + existing California climate change legislation, direction from ARB, and guidance from California air districts;
- + general understanding of the probable range of GHG reduction opportunities from various types of local and statewide measures;
- + the range of targets and goals set by other Solano County jurisdictions who have completed CAPs; and
- + the feasibility of achieving different GHG targets.

State Legislation and Guidance

The underlying purpose of AB 32 is to take state action that will result in an **absolute reduction** in the atmospheric level of carbon dioxide and other greenhouse gases, which contribute to the impacts commonly associated with climate change. Therefore, the state has set mass emissions reduction targets at the statewide level.

In 2005, Executive Order S-3-05 identified California's vulnerability to the impacts of GHG emissions. The Executive Order established a long-range GHG reduction target of 80% below 1990 levels by 2050. Subsequently, AB 32, the California Global Warming Solutions Act of 2006 was signed, requiring California to reduce *statewide* GHG emissions to 1990 levels by 2020.

AB 32 also directed ARB to develop and implement regulations that reduce statewide GHG emissions. ARB approved *The Climate Change Scoping Plan* (Scoping Plan) in December 2008, which outlines the state's plan to achieve the GHG reductions required in AB 32. The Scoping Plan does not define the specific role local governments, like the City of Dixon, will play in meeting the state's GHG reduction goals, but does identify cities and counties as "essential partners" within the overall statewide effort.

However, many local governments do not have sufficient historical data available to prepare a 1990 baseline emissions inventory, which would allow local governments to establish reduction targets that exactly mimic the state's own targets. In the 2008 Scoping Plan, ARB "encourages local governments to adopt a reduction goal for municipal operations emissions and move toward establishing similar goals for community emissions that parallel the state commitment to reduce greenhouse gas emissions by approximately 15 percent from current levels by 2020."ⁱⁱ

Based on this language, many communitywide CAPs select a reduction target of 15% below baseline levels by 2020 to parallel the state's target. Some CAPs also establish a longer-term target to show the city's trajectory towards the state's 2050 goal of 80% below 1990 levels.

California Environmental Quality Act

The City of Dixon intends to proactively use the tiering benefits provided under CEQA for communities that have adopted a "... local plan for the reduction or mitigation of GHG emissions" pursuant to SB 97 and State CEQA Guidelines Section 15183.5. If the CAP is prepared in a manner that meets the framework set forth in the CEQA Guidelines, the city can tier from the CAP's CEQA document for the cumulative GHG emissions analysis of future development projects that are consistent with the CAP, eliminating the need for project-specific GHG analysis and mitigation measures.

State CEQA Guidelines Section 15183.5 establishes criteria that a GHG reduction plan, such as Dixon's CAP, should meet in order to provide for streamlining of future development projects consistent with the plan. In general, such plans should:

- + Quantify GHG emissions within a defined area,
- + Establish a level where GHG emissions are not cumulatively considerable,
- + Identify emissions from activities covered by the plan,
- + Specify measures to achieve the emissions reduction goal,
- + Monitor progress and amend if necessary, and
- + Be adopted in a public process following environmental review.

Section 15183.5(b)(1)(B) specifically requires that a GHG reduction target must "Establish a level, below which the contribution to [GHG] emissions from activities covered by the plan would not be cumulatively considerable." To comply with this provision within the guidelines, a reduction target must be based on substantial evidence.

Air Quality Management District Guidance

The Yolo-Solano Air Quality Management District (YSAQMD), under whose jurisdiction Dixon falls, has not established thresholds of significance for GHG emissions. Several air districts and state agencies (including the Bay Area Air Quality Management District (BAAQMD) and ARB) have established substantial evidence associated with recommended communitywide emissions reduction targets. Since two of the participating cities in this CAP effort are within the BAAQMD jurisdiction, and because YSAQMD has not established its own thresholds of significance for GHG emissions, the participating cities decided to consider BAAQMD's guidance when selecting their reduction targets.

As previously mentioned, the 2008 Scoping Plan presents substantial evidence recommending local agencies seek to reduce communitywide emissions by 15% below current emission levels by 2020. In 2010, BAAQMD also adopted CEQA Air Quality Guidelines that presented substantial evidence for three communitywide emissions reduction targets: 1) 1990 levels by 2020, 2) 15% below current (2008 or earlier) levels by 2020, or 3) use of an efficiency threshold of 6.6 MT CO₂e/yr per service population (i.e., residents plus employees) by 2020. This efficiency threshold is intended to be used only in the context of general or communitywide plans, not individual development projects.

However, BAAQMD's June 2010 adopted thresholds of significance were challenged in a lawsuit, and the Alameda County Superior Court issued a judgment finding in 2012 that the Air District had failed to comply with CEQA when it adopted the thresholds. The court found that the adoption of the thresholds was a project under CEQA and ordered the Air District to examine whether the thresholds would have a significant impact on the environment under CEQA before recommending their use. The court issued a writ of mandate ordering the Air District to set aside the thresholds and cease dissemination of them until the Air District had complied with CEQA. In view of the trial court's order, which remains in place pending final resolution of the case, the Air District is no longer recommending that the thresholds be used as a generally applicable measure of a project's significant air quality impacts.

However, the court did not determine whether the thresholds are or are not based on substantial evidence and thus valid on the merits. Therefore, cities could continue to rely on the substantial evidence based on statewide data and analysis relative to AB 32 that underlies the June 2010 BAAQMD thresholds when making an independent determination of significance of plan-level GHG impacts pursuant to State CEQA Guidelines Section 15064.7(c).

The logic behind BAAQMD's efficiency target is that if all California communities achieved the same level of efficiency on a "fair-share" per service population basis, then the state would achieve its AB 32 GHG reduction goal for 2020. The target metric was calculated by dividing total statewide land use-generated emissions in 2020 by the total population and jobs projected in the state in 2020, as shown in Table 2.5.

Building upon this logic, the project team further refined the efficiency threshold targets, and projected them towards the state's 2050 reduction target at ten-year intervals (with a 2035 target included for consistency with the SB 375 horizon year). Table 2.6 demonstrates the calculation of efficiency level thresholds that were considered as possible targets by the participating cities in development of their CAPs.

**Table 2.5
Statewide Efficiency Level Threshold - 2020**

	2020 Horizon Year
Population ¹	40,643,643
Employment ²	18,994,360
Service Population (SP)	59,638,003
Emissions Level Target ³	395,830,000 MT CO ₂ e/yr
Emissions per SP	6.6 MT CO ₂ e/SP/yr

Source: Adapted by AECOM, 2013

¹ Population from California Department of Finance 2013 Forecasts

² Employment is from EDD, extrapolated from 2018 estimates to 2020

³ Represents the 2020 horizon year target, which is a return to 1990 emission levels, as represented in the ARB California Greenhouse Gas Inventory for 1990. Includes only the Energy and Waste sectors from the 1990 inventory. The Industrial Processes and Product Use sector and Agriculture, Forestry, and Other Land Use sector were omitted because their emissions are not derived from urban development activities (e.g., residential construction, commercial development).

**Table 2.6
Efficiency Threshold Targets through 2050**

	2020	2030	2035	2040	2050
Population ¹	40,643,643	44,279,354	46,083,482	47,690,186	50,365,074
Total Employment ²	18,994,360	20,693,470	21,536,609	22,287,484	23,537,564
Total Employment minus Farm, Mining, Logging, Manufacturing ²	17,314,380	18,863,210	19,631,777	20,316,240	21,455,755
Total Service Population	59,638,003	64,972,824	67,620,091	69,977,670	73,902,638
Total Service Population minus Farm, Mining, Logging, Manufacturing	57,958,023	63,142,564	65,715,259	68,006,426	71,820,829
Emissions Level Target ³ (MT CO ₂ e/yr)	264,100,000	193,673,333	158,460,000	123,246,667	52,820,000
Emissions per Service Population (MT CO ₂ e/SP/yr)	4.6	3.1	2.4	1.8	0.7

Source: AECOM, 2013

¹ Population from California Department of Finance 2013 Forecasts

² Employment is from EDD, extrapolated from 2018 estimates to 2020. Then, extrapolated to 2035 based on population to land-use-related job ratio in 2020. Non-farm, mining, logging, manufacturing estimate for 2030 and beyond is based on 2020 ratio between total employment and non-land use employment.

³ Further revisions were made to emissions in the Energy and Waste sectors that were included in Table 2.5. In general, revisions were made to exclude industrial emissions across all sectors, national security emissions, and certain transportation-related emissions, such as aviation and water borne transportation. See Appendix B for further detail on the calculation of this revised 2020 emissions levels. The revised 2020 emissions level then represents a 1990 baseline, which is used to calculate the 2050 emissions level target (i.e., 80% below the 2020 level shown here). Emissions level targets for intermediary years were projected using linear growth calculations.

Local Government Targets in Solano County

The participating cities also considered the GHG emission reduction targets established in adopted or proposed CAPs prepared by other jurisdictions in Solano County, which include:

- + City of Benicia CAP – 10% below 2000 levels by 2020
- + City of Vacaville Draft CAP – 21.7% below 2020 BAU levels by 2020
- + City of Vallejo CAP – 15% below 2008 levels by 2020
- + Solano County CAP – 20% below 2005 levels by 2020

Although different targets and baseline years (or horizon year in the case of Vacaville) are used by each jurisdiction, each of these targets aims to be consistent with the statewide goals of AB 32, and with either the Scoping Plan or more recent ARB statewide projections consistent with the Scoping Plan. In other words, they all meet or exceed AB 32 requirements for 2020. Additionally, none of these jurisdictions have established targets for the 2035 timeframe.

TARGET OPTIONS CONSIDERED

As part of their collaborative CAP development effort, Dixon and the other participating cities have chosen to establish 2020 and 2035 targets that meet the following criteria:

- + Are realistic and achievable
- + Consider impacts of statewide and local actions
- + Parallel statewide emissions reduction targets
- + Are based on substantial evidence to allow CEQA streamlining benefits

While adherence to these criteria has resulted in the selection of different targets among the participating cities, mass emissions targets were selected when feasible to demonstrate consistency with the state's absolute emissions reduction efforts (in contrast to an efficiency target as described above). Ultimately, targets were chosen to respond to the unique characteristics of each community while still demonstrating a local contribution to the state's emissions reduction goals.

Mass Emissions Target Option

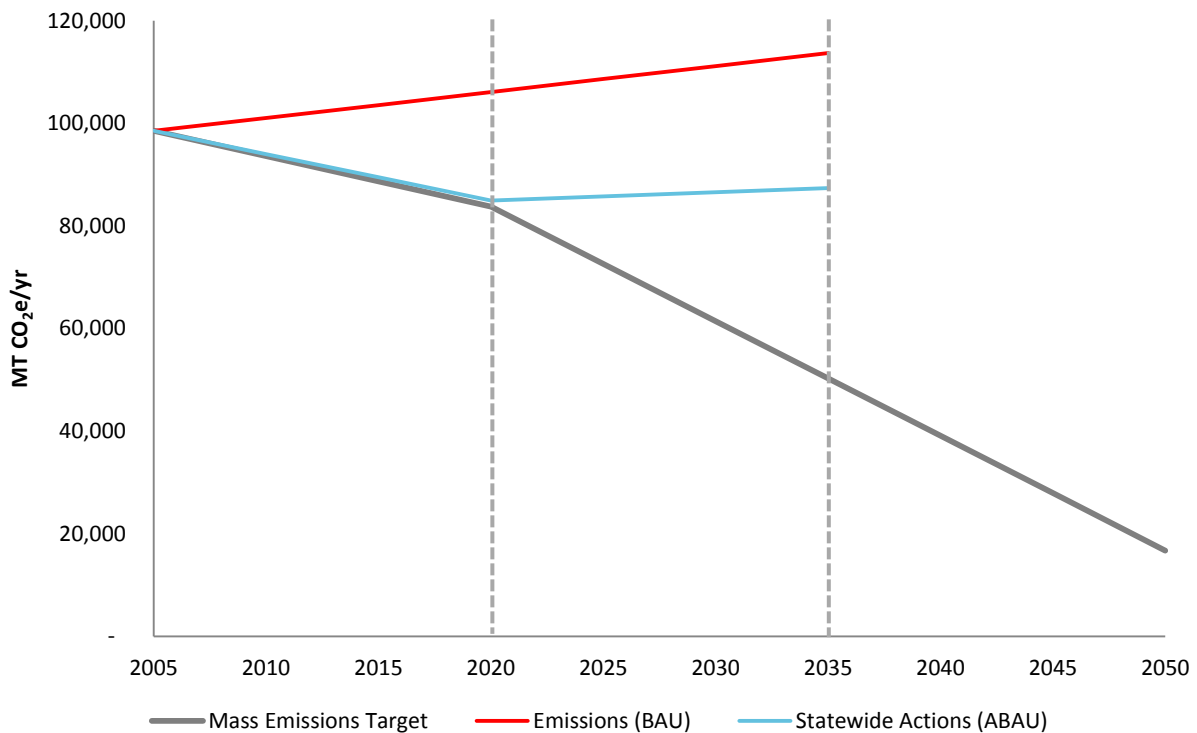
Table 2.7 shows the reductions that would be required in Dixon under a mass emissions target for 2020 and 2035. Table 2.7 also shows the reductions contributions attributable to statewide actions, and the remaining emissions reduction gap to be addressed by the local actions presented in Chapter 3. Figure 2.2 illustrates the same information with a red line showing the city's emissions trajectory towards 2035 and a blue line representing ABAU emissions to show the impact of statewide actions. The gray line shows the necessary emissions trajectory to achieve a near-term 2020 target and a longer-term 2050 target, with a dashed line marking an interim 2035 target. The table and figure both show that under a mass emissions reduction scenario, statewide actions would nearly achieve the reduction target in 2020, leaving little work for local CAP actions to do in order to close the gap.

**Table 2.7
Mass Emissions Reduction Targets**

	2005 (MT CO₂e/yr)	2020 (MT CO₂e/yr)	2035 (MT CO₂e/yr)
Inventory and BAU Projections	98,501	106,066	113,676
Reduction Target (2020 and 2035)		83,726	50,236
Reductions Needed to Achieve Target		22,340	63,440
Assumed Statewide Reductions		21,127	26,304
Local Action Reductions Needed to Achieve Targets		1,213	37,136

Source: AECOM 2013

Figure 2.3 – Mass Emissions Reduction Target Option



Efficiency Threshold Target Option

Table 2.8 uses the statewide efficiency targets shown in Table 2.6 as the local emissions targets by applying Dixon’s projected service population. As previously described, this type of target could allow mass emissions to increase, while reducing per capita GHG emissions. Table 2.8 shows that under an efficiency threshold approach, the city’s 2020 target would be 4.6 MT CO₂e/SP/yr, and BAU emissions forecasts are equivalent to 4.3 MT CO₂e/SP/yr. Statewide actions would reduce the emissions forecasts even further, indicating that no local actions would be required to achieve the 2020 target. However, as noted above, the participating cities decided to select mass emissions

targets when feasible to demonstrate consistency with the state’s absolute emissions reduction efforts.

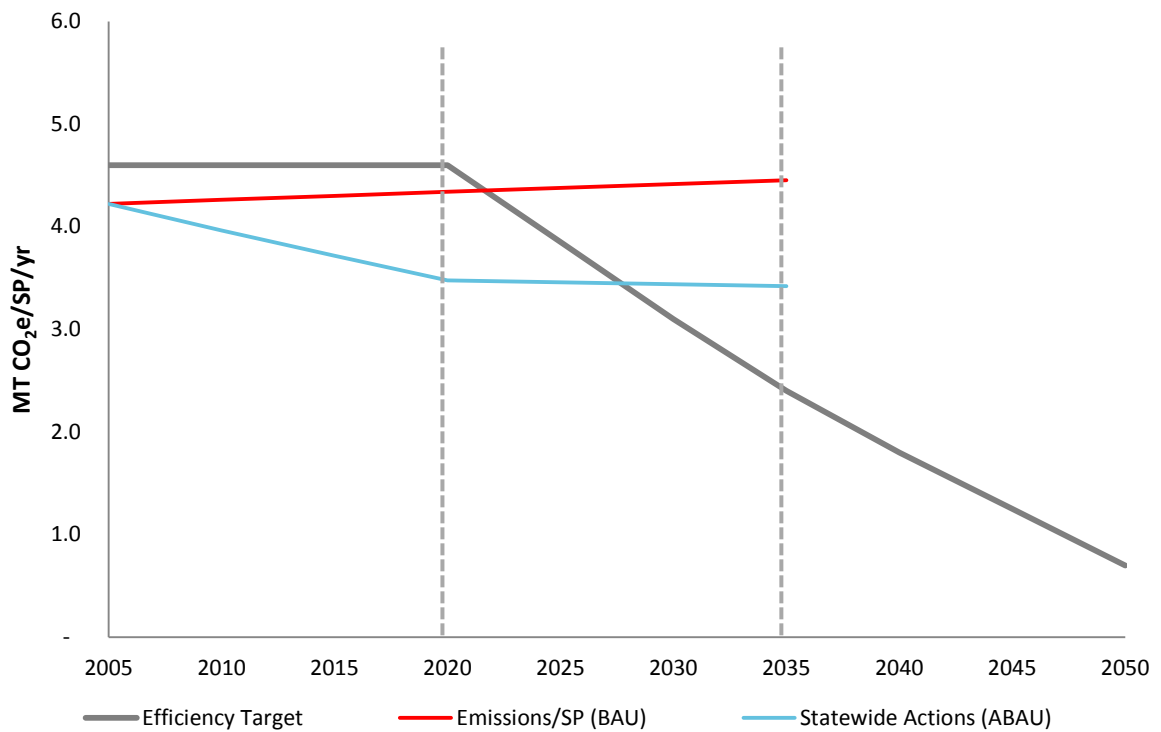
Table 2.8 Efficiency Threshold Reduction Targets			
	2005	2020	2035
Service Population (population + employment)	23,340	24,440	25,539
Inventory and BAU Projections (MT CO ₂ e/yr)	98,501	106,066	113,676
BAU Efficiency Level (MT CO ₂ e/SP/yr)	4.2	4.3	4.5
Efficiency Level Target (MT CO ₂ e/SP/yr)	-	4.6	2.4
Efficiency Level Target (MT CO ₂ e/yr)		112,424	61,294
Reductions Needed to Achieve Target ² (MT CO ₂ e/yr)		0	52,382
Assumed Statewide Reductions (MT CO ₂ e/yr)		21,127	26,304
Local Action Reductions Needed to Achieve Targets		0	26,078

Source: AECOM 2013

¹ Per Table 2.6

² 2020 efficiency level target is greater than 2020 forecast emissions, which means the city would achieve its 2020 target without statewide or local actions

Figure 2.4 – Efficiency Target Option



DIXON'S EMISSIONS REDUCTION TARGETS

Based on the estimated growth projected in the city through 2035 and each of the target setting considerations described above, Dixon has selected the following mass emissions reduction targets for 2020 and 2035:

- + **2020:** 15% below 2005 emissions levels
- + **2035:** 49% below 2005 emissions levels

These targets will allow the city to demonstrate contributions toward statewide absolute emissions reductions, and will provide opportunities for future CEQA streamlining benefits based on the substantial evidence supporting these metrics found in the Scoping Plan and BAAQMD's June 2010 thresholds of significance. These targets are also consistent with those selected by the other participating cities, which further supports the regional collaboration established during plan development. The 2020 target is directly related to the previously described guidance from ARB and BAAQMD, whereas the 2035 target represents consistency with a linear trajectory towards the state's long-term target of 80% below 1990 levels by 2050.

2020 Emissions Reduction Target

Based on the 2005 emissions inventory and 2020 forecasts presented in this chapter, the 2020 communitywide emissions reduction target is 83,726 MT CO₂e/yr (i.e., 15% below 2005 emissions levels). Reductions totaling 22,340 MT CO₂e/yr in 2020 are required to achieve this target. The 2020 statewide reductions identified in Table 2.4 would contribute emissions reductions of 21,127 MT CO₂e/yr. The remaining gap of 1,213 MT CO₂e/yr will be addressed through local actions described in Chapter 3.

2035 Emissions Reduction Target

Achieving the 2035 communitywide emissions reduction target of 50,236 MT CO₂e/yr (i.e., 49% below 2005 emissions levels) would require reductions totaling 63,440 MT CO₂e/yr. Statewide reductions identified in Table 2.4 would contribute 26,304 MT CO₂e/yr, leaving a reductions gap of 37,136 MT CO₂e/yr to be addressed through local actions and additional or enhanced statewide actions.

Notes

ⁱ International Panel on Climate Change. *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007*. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.). [Cambridge University Press](#), Cambridge, United Kingdom and New York, NY, USA. Available at: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html.

ⁱⁱ California Air Resources Board. *Climate Change Scoping Plan: a Framework for Change*. December 2008. Available at: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf.

CHAPTER 3

EMISSIONS REDUCTION MEASURES

3

This chapter describes measures and actions that would be needed to reduce communitywide greenhouse gas (GHG) emissions, and achieve the city's 2020 and 2035 reduction targets. Most measures are designed to achieve quantifiable GHG reductions, while others are listed as supporting measures because they cannot be accurately quantified. To ensure proper implementation, each measure is accompanied by a description providing policy background and implementation details that articulate necessary actions; city departments with primary action responsibility; and progress indicator timelines to track implementation. The city will evaluate effectiveness of CAP measures and actions every three to five years and propose program modifications if necessary to achieve reduction targets.

Summary of Reductions

Table 3.1 summarizes GHG emission reductions anticipated from implementation of the measures and actions presented in this chapter and the statewide reductions described in Chapter 2. These measures, as well as unquantified supporting measures, are described in detail throughout this chapter to describe how each contributes to emissions reductions and how they will be implemented in Dixon. A target achievement discussion is presented at the end of this chapter to show how the city can achieve its 2020 reduction target, and what steps should be taken to put the city on a path towards achievement of longer-term emissions reduction targets.

Table 3.1 Measures and Quantified Reductions			
ENERGY STRATEGY		2020 (MT CO₂e/yr)	2035 (MT CO₂e/yr)
E-1. Existing Buildings			
E-1.1	Energy Efficiency Retrofit Outreach	213	598
E-1.3	Commercial Energy Conservation Ordinance	17	62
E-2. New Construction			
E-2.1	New Construction Energy Efficiency	20	- ¹
E-4. Building Appliances			
E-4.1	ENERGY STAR Appliances	33	68
E-4.2	Smart Grid	216	426
E-5. Building Cooling			
E-5.1	Building Shade Trees	29	43
E-5.2	Cool Roofs	38	- ¹
E-7. Renewable Energy			
E-7.1	Solar Photovoltaic Systems	1,447	2,687
E-7.2	Solar Water Heaters	49	255
E-7.3	Residential Renewable Energy Requirements	754	1,633
E-7.5	Community Choice Aggregation	0	- ²
E-8. Street and Area Lighting			
E-8.1	Street Light Upgrade	58	58
E-8.2	Traffic Light Upgrade	1	1
E-8.3	Parking Lot Lighting Upgrade	13	33
E-9. Municipal Actions			
E-9.1	Municipal Renewable Energy Development	86	86
E-9.2	Municipal Building Energy Efficiency	45	53
E-9.3	Wastewater Treatment Plant Process Energy Optimization	170	170
Subtotal Energy		3,189	6,173

TRANSPORTATION AND LAND USE STRATEGY		2020	2035
		(MT CO₂e/yr)	(MT CO₂e/yr)
T-4.1	Alternative Fuel Vehicles	553	- ²
T-5.1	Transportation Demand Management	110	177
Subtotal Transportation and Land Use		663	177
WATER STRATEGY		2020	2035
		(MT CO₂e/yr)	(MT CO₂e/yr)
W-1.1	SB X7-7	394	474
Subtotal Water		394	474
SOLID WASTE STRATEGY		2020	2035
		(MT CO₂e/yr)	(MT CO₂e/yr)
SW-2.1	Residential Food Scrap Diversion	7	227
SW-2.2	Commercial Food Scrap Collection	13	122
SW-2.3	Yard Waste Diversion	49	154
SW-2.4	Construction and Demolition Waste	67	318
Subtotal Solid Waste		136	821
GREEN INFRASTRUCTURE STRATEGY		2020	2035
		(MT CO₂e/yr)	(MT CO₂e/yr)
GI-1.1	Urban Forest Program	219	333
Subtotal Green Infrastructure		219	333
SUBTOTAL CAP MEASURES		4,601	7,978
STATEWIDE REDUCTIONS			
Renewable Portfolio Standard + PG&E De-Carbonization		9,966	10,415
AB 1109 – Lighting Efficiency Program		1,048	1,048
2013 California Building Energy Efficiency Standards		126	- ³
Zero Net Energy Buildings Goal		- ⁴	506
Pavley I and II		7,108	11,548
Low Carbon Fuel Standard		2,712	2,603
Vehicle Efficiency Regulations		167	184
Subtotal		21,127	26,304
TOTAL REDUCTIONS		25,728	34,282

Note: Subtotals and totals may not appear to add correctly due to rounding.

¹ Included in 2035 statewide calculation for zero net energy building goal;

² See *Progress toward 2035 Target* discussion at end of chapter for additional detail;

³ Reductions from 2013 Building Energy Efficiency Standards are replaced in 2035 with the CEC's Zero Net Energy Buildings Goal to avoid double counting emissions reductions with overlapping statewide actions;

⁴ The CEC's Zero Net Energy Buildings Goal is intended to take effect beginning in 2020 for residential buildings and 2030 for nonresidential buildings.

Measure Structure

This chapter is organized according to six strategy areas: cross-cutting strategies, energy, transportation, water, solid waste, and green infrastructure. These strategies represent the primary avenues by which to reduce communitywide GHG emissions in Dixon. Each strategy area section begins with an introduction to the overarching concepts that tie that particular strategy to GHG emission generation and potential reductions. The strategy overview is followed by the specific measures and actions that translate the city's vision into on-the-ground implementation.

REDUCTION MEASURES

Measures define the programs, policies, and projects that the city will undertake to accomplish its GHG emission reduction goals. Each measure includes information related to GHG reduction potential, opportunities for regional implementation, sustainability co-benefits, and relative magnitude of cost.

REDUCTION POTENTIAL

The estimated annual emissions reduction potential of each quantifiable measure is provided for 2020 and 2035 in MT CO₂e/yr. Some measures have the same reduction potential for both horizon years because the underlying participation assumptions are held constant. Measures identified as "Supporting Measures" contribute to GHG reductions and are an important component of this CAP, but currently lack a methodology to quantify their emissions reduction potential. For example, the proposed sustainability coordinator position described in Measure CC-1.1 is critical to the full implementation of other CAP measures, but it is not possible to accurately calculate the emissions reductions specifically related to that new staff position. Appendix B describes the methodology used to quantify emissions reductions.

ICONS

Graphic icons are used in this chapter to indicate measures that have regional implementation opportunities, sustainability co-benefits associated with the measures, and simple cost estimates for mandatory components of measures. Figure 3.1 presents the icons found throughout this measure.

Regional Efforts

Measures that would benefit from a regional implementation strategy are denoted as Regional Efforts. The four participating cities (i.e., Dixon, Fairfield, Rio Vista, and Suisun City) could collaborate on implementing these measures to reduce overhead costs associated with new program development, or could partner with other regional agencies to create a sustainability coordinator position to oversee CAP implementation.

Co-Benefits

As described in Chapter 1, implementation of these measures will provide additional community benefits beyond their GHG reductions. The icons listed with each measure represent only a sample of the numerous co-benefits related to individual measures.

Cost Analysis

Some CAP measures require residents and local businesses to take action or direct the city government to develop and implement additional programs. Simple cost estimates (i.e., Very Low, Low, Medium, High) for these mandatory actions are provided for informational purposes only to help weigh the potential costs and benefits of certain measures. Cost estimates shown in this chapter reflect average annual costs to the city to implement the measures as described. Cost analysis was not performed for measures that describe current and on-going city programs and actions, or voluntary measures that rely on residents and businesses to make personal decisions regarding the importance and value of certain actions. Appendix C provides assumptions used to calculate these simple cost estimates.

Figure 3.1 – CAP Measure Co-Benefits



MEASURE BACKGROUND

The measure background section provides information about the specifics of a measure, including descriptions of various technologies or financing mechanisms. This section also provides information on currently available rebates and other financial incentives related to the measure, and describes any actions the city has taken to date towards implementation of that measure. Additionally, some descriptions provide guidance that will be used in program implementation, such as components of the outreach plan and which segments of the community should be targeted for inclusion.

ACTIONS AND PROGRESS INDICATORS

Action steps and progress indicators are provided in a table following each measure description. Actions identify specific steps that the city will take to implement the measure. The table also identifies responsible departments or agencies that would be best positioned to lead or provide input for implementation of certain tasks. Measures that could be implemented by a regional Sustainability Coordinator, as described in Measure CC-1.1, are identified should the participating cities secure funding for such a position. In most cases, an alternative responsible department is also listed in the event that a sustainability coordinator position cannot be established.

Progress indicators describe the specific action that is being quantified to estimate the reduction potential. These indicators enable city staff, the City Council, and the public to track implementation and monitor overall CAP progress. Progress indicators are provided for both 2020 and 2035, where applicable, and are specifically described when possible with quantified metrics, such as square feet (sq ft) renovated, number of solar hot water heaters installed, or number of employees participating in commute reduction programs. Progress indicators are not provided for supporting measures, which do not have quantifiable emissions reductions.

Reduction Strategies

The strategies identified in this chapter affect issues within the city's direct influence. Each strategy is subdivided into various sub-strategy headings to help organize the reduction measures. Measures were developed by (a) evaluating existing community conditions, (b) identifying emission reduction opportunities within the community, (c) reviewing best practices from other jurisdictions and organizations, and (d) incorporating state and regional laws, guidelines, and recommendations. Dixon's measures were also developed as part of a regional conversation between the cities of Fairfield, Rio Vista, and Suisun City to provide as much consistency between the four cities CAPs as possible. The adopted CAPs for Solano County and the Cities of Benicia and Vallejo were also reviewed as part of the measure development process to lay the foundation for regional implementation efforts.

The emission reduction strategies are as follows:

- + **Cross-Cutting:** The Cross-Cutting Strategy describes overarching opportunities for regional implementation, but does not include estimates for direct emissions reductions.

- + **Energy:** The Energy Strategy recommends ways to increase energy efficiency in existing buildings, enhance energy performance for new construction, and increase use of renewable energy.
- + **Transportation:** The Transportation Strategy encourages transit, carpooling, walking, and bicycling as viable transportation modes to decrease the need to drive.
- + **Water:** The Water Strategy promotes the efficient use and conservation of water in buildings and landscapes.
- + **Waste:** The Waste Strategy increases waste diversion and recycling, reducing consumption of materials that otherwise end up in landfills.
- + **Green Infrastructure:** The Green Infrastructure strategy suggests ways to enhance the existing urban forest.

Cross-Cutting Strategies

During CAP development, the participating cities identified a need for regional support in the CAP implementation process. Numerous measures were designed to be implemented through collaboration to leverage limited resources and convey a consistent message throughout the county. The following two measures represent this overarching strategy of regional collaboration.

Measure CC-1.1: Sustainability Coordinator

Supporting Measure – Not Quantified

Establish a full-time regional sustainability coordinator to monitor CAP implementation and promote regional sustainability efforts. Explore opportunities to partner with other Solano County governments on this effort (e.g., City of Benicia, Solano County).



Measure Background

Implementation of the following measures described in this CAP will likely require an effort that surpasses the available capacity of existing city staff. Further, numerous measures are identified as “Regional Opportunities” that would benefit from collaboration among the different Solano County governments. Therefore, the participating cities recommended the creation of a regional sustainability coordinator position, which could oversee implementation of CAP measures that rely on regional collaboration.

The sustainability coordinator would act as a liaison between local governments, residents, and businesses in Solano County to implement and track progress of CAP measures and actions. A regional approach would provide implementation efficiencies

on certain measures, and would also help to disseminate best practices information to the local governments regarding other measures. The sustainability coordinator could also act as the point of contact for various regional agencies, including STA, PG&E, the Solano EDC, and the Solano Center for Business Innovation. This would allow one person to gain experience in facilitating implementation of the various programs described throughout this CAP, as opposed to multiple employees of each local government having to coordinate their efforts.

In recent years, several city and county governments have been able to sponsor a full-time sustainability coordinator position through American Reinvestment and Recovery Act (ARRA) grant funding or similar programs. The city will collaborate with other local governments to identify and pursue grant funding to establish a regional sustainability coordinator position.

Action	Responsibility
A Secure funding for regional Sustainability Coordinator position.	Community Development; Solano EDC
B Coordinate with other Solano cities and the County to prioritize regional sustainability issues and programs for joint implementation.	Community Development; Solano EDC

Measure CC-1.2: Public Outreach

Supporting Measure – Not Quantified

Develop coordinated outreach campaign to fulfill the public outreach components recommended throughout this CAP.



Measure Background

Community engagement and effective participation are essential to the successful implementation of this CAP. During the CAP implementation period, the city will conduct outreach programs that involve residents and businesses in various activities, assessments, and actions.

Effective public participation will increase the likelihood that the measures recommended in this plan achieve estimated participation rates. Furthermore, Dixon will see higher participation rates if outreach and education programs are adapted over time to meet the changing needs of the community. Increased participation rates will result in increased emissions reductions.

At the start of each fiscal year, the city will work with local stakeholders to determine the outreach priorities of the community, which could be a certain segment of the community (e.g., a group of neighborhoods, the agricultural community, the retail sector) or a specific action (e.g., carpooling, biking, lighting). Outreach priorities should be related to measures described in the CAP. The city will strive to designate at least one outreach event per quarter to address the chosen priority areas. The city could also

designate one week per year to conduct a high-profile outreach campaign targeting a specific measure or strategy area. The campaign week could also be used to recognize community members or businesses that have implemented major improvements.

Numerous measures described in this chapter would benefit from a website that could serve as a central source of information on resource conservation strategies, technical assistance for a variety of topics, and a clearinghouse for rebates and other financial incentives to help implement CAP strategies. The city will work with the Sustainability Coordinator and other local governments to develop a Solano County Sustainability Website that will be a resource for all residents and businesses in the county.

Action	Responsibility
A Work with local stakeholders to determine the CAP outreach priorities for the year.	Community Development
B Designate at least one outreach event per quarter to address the priority areas.	Community Development
C Conduct a high-profile energy efficiency outreach campaign; recognize community members that have implemented major improvements.	Sustainability Coordinator
D Partner with other Solano County governments to develop a county sustainability website.	Sustainability Coordinator

Energy Strategy

The consumption of electricity for appliances, lighting, and cooling, and combustion of natural gas for heating, cooking, and other processes within residential, commercial, and industrial buildings generated nearly one half of Dixon's communitywide GHG emissions in 2005. These emissions can be reduced by improving energy efficiency in new and existing buildings and increasing the amount of electricity and heat generated from renewable energy sources.

In Dixon, approximately 44%ⁱ of the housing stock was built before California's energy code, Title 24 Part 6, was first adopted in 1978. Consequently, the building stock offers considerable opportunity for cost-effective energy efficiency retrofits to decrease the use of both electricity and natural gas. The city plans to achieve building energy efficiency improvements in both existing and new buildings through a combination of community outreach and education, incentives, and regulations.

Pacific Gas and Electric Company (PG&E) is Dixon's energy utility, providing both natural gas and electricity for residential, commercial, industrial, and municipal uses. PG&E provides electricity generated at hydroelectric, nuclear, renewable, natural gas, and coal facilities. As of 2011, natural gas facilities provided 25% of the total electricity supply; nuclear plants provided 22%; renewable energy facilities including solar, geothermal, and biomass provided 19%; large hydroelectric operations provided 18%; and unspecified sources provided the remainder.ⁱⁱ Under the provisions of SB 107 (2006), investor-owned utilities were required to generate 20% of their retail electricity using qualified renewable energy technologies by the end of 2010. In compliance with this mandate, PG&E will expand its renewable generation portfolio, making additional GHG-free electricity available to customers in Dixon. In 2011, PG&E delivered 19% of total electricity from eligible renewable sources.

The city will encourage communitywide installation of rooftop solar photovoltaic (PV) and solar hot water systems to increase the portion of Dixon's energy portfolio provided from renewable sources. The city has already installed approximately 380 kW of solar PV capacity on municipal buildings to increase the generation of solar energy in the community.

The total GHG emission reduction potential of the Energy Strategy is 3,189 MT CO₂e/yr in 2020. This represents about 12% of total 2020 reductions.

E-1: Existing Buildings

Measure E-1.1: Energy Efficiency Retrofit Outreach

2020 GHG Reduction Potential: **213 MT CO₂e/yr**

2035 GHG Reduction Potential: **598 MT CO₂e/yr**

Encourage voluntary energy efficiency retrofits in residential and nonresidential buildings through promotion of local efforts.



Measure Background

Energy efficiency improvements to residential and nonresidential structures can reduce both energy bills and GHG emissions. Many residences (approximately 63 percentⁱⁱⁱ) in Dixon are owner-occupied, and thus the financial savings of home energy efficiency retrofits are in the long term economic interest of the homeowner. As such, the city will emphasize voluntary participation in energy efficiency retrofit programs, in lieu of mandatory programs. As part of the outreach program, the city will enhance its website by linking to information on existing energy efficiency rebates and other financial incentives, including PG&E incentives to businesses for energy efficiency improvements. The website could also contain local case studies of businesses that have completed cost effective energy efficiency improvements.

To encourage participation from residential homeowners, the city will partner with the Solano Center for Business Innovation to leverage Energy Upgrade California's educational materials and online platform that provides access to incentives, technical assistance, and qualified contractors. Typical rebates and incentives available to Solano County residents through Energy Upgrade California include PG&E's Basic and Advanced Retrofit Packages, pool pumps and motor rebates, efficient water heaters/blankets, HVAC upgrades, furnace upgrades, and wall insulation installation. The city will also promote resources such as California Flex Alert, the Department of Energy's (DOE) Weatherization Assistance Program for low-income households, and PG&E's SmartEnergy Analyzer™ program, all of which link residential property owners to educational and financial resources. In addition, PG&E is working to fulfill Goal 2.2 of the CPUC *Long-Term Energy Efficiency Strategic Plan*, which states, "By 2020, 100 percent of eligible and willing customers will have received all cost-effective Low Income Energy Efficiency measures."

Financing is critical to the success of the energy efficiency retrofit program. The city will continue to support the development of a Property Assessed Clean Energy program (see Measure E-3.2) to further promote energy efficiency retrofits. The city will also partner with local real estate professionals to inform homebuyers about the benefits of home energy audits and the availability of energy efficiency mortgages to finance installation of retrofit packages.

Action	Responsibility
A Develop and maintain a Solano County Sustainability Website with information about current energy efficiency rebates and incentives (including links to PG&E and Energy Upgrade California rebate pages) and local energy efficiency improvement case studies. Leverage Energy Upgrade California outreach and educational materials.	Sustainability Coordinator
B Provide training to Building Division counter staff regarding available sources of rebates/incentives and printed pamphlets or FAQ sheets.	Building Division; Sustainability Coordinator
C Provide targeted outreach to low-income and elderly households with information about the federal weatherization program and statewide Energy Savings Assistance Program, and how improvements can increase occupant comfort levels and reduce utility bills.	Community Development; Sustainability Coordinator

Progress Indicators	Year
175 single-family houses install a comprehensive retrofit package; 500 single-family houses install a basic retrofit package; 25 multi-family units are upgraded with comprehensive retrofit; 60 multi-family units are upgraded with basic retrofit package; 165,000 sq ft of nonresidential area installs a comprehensive retrofit package; 470,000 sq ft of nonresidential area installs a basic retrofit package	2020
500 single-family houses install a comprehensive retrofit package; 1,500 single-family houses install a basic retrofit package; 75 multi-family units are upgraded with comprehensive retrofit; 200 multi-family units are upgraded with basic retrofit package; 470,000 sq ft of nonresidential area installs a comprehensive retrofit package; 1.4 million sq ft of nonresidential area installs a basic retrofit package	2035

Measure E-1.2: Energy Efficiency Audits

Supporting Measure – Not Quantified

Encourage voluntary energy audits for residential and nonresidential buildings to identify cost-effective improvements.



Measure Background

Approximately 44%^{iv} of houses in Dixon were built before 1980, and therefore prior to or about the time of first adoption of California’s Title 24 energy efficiency requirements. These homes are excellent candidates for energy-saving retrofits, which could be identified through energy audits.

Building energy audits can help identify and prioritize energy efficiency improvements by providing a building-specific list of retrofit options and their cost-effectiveness.

Additionally, the California Energy Commission (CEC) developed the Statewide Home Energy Rating System (HERS) program to allow comparisons of the efficiency levels between California homes. A home’s HERS rating is calculated as part of an energy audit, and informs homeowners and renters about energy efficiency much like the MPG metric allows comparisons of vehicles. This type of rating assists in estimating the relative utility costs associated with a home so that renters and buyers can factor those costs into their decision.

The city will partner with the Solano Center for Business Innovation to develop a comprehensive outreach campaign that describes the benefit of energy audits and available rebates, incentives, and financing options, such as PG&E’s no- or low-cost energy audit programs for nonresidential customers and residential energy audit rebates available through Energy Upgrade California. Residential audits should be performed per the Whole House Energy Rating required by Energy Upgrade California. To help residents finance home energy audits, the city should pursue grant funding to provide a partial rebate for residents that voluntarily perform energy audits. Previous sources of funding have included Energy Efficiency Conservation Block Grants (EECBG) and the CEC.

As part of this outreach campaign, the city will identify neighborhoods with concentrations of older homes to help focus the outreach toward buildings that will receive the greatest energy savings. The city will also work with PG&E to identify large-energy users that would benefit from energy audits and could be eligible for PG&E’s on-bill financing to install retrofit packages identified in the audit. For these larger energy customers, PG&E offers low- or no-cost energy audit services that include on-site analysis of energy consuming systems and customized calculations to help create a strategic plan for implementing projects. The city should also partner with local real estate professionals to help educate home buyers about the value of energy audits at the point of sale. Realtors should also be encouraged to include a home’s HERS rating in the MLS listing.

Action	Responsibility
A Develop a comprehensive outreach campaign that describes the benefit of energy audits and available rebates, incentives, and financing options.	Solano Center for Business Innovation; Sustainability Coordinator
B Pursue grant funding to provide a partial rebate for residents and businesses that voluntarily perform energy audits.	Solano Center for Business Innovation; Sustainability Coordinator
C Identify neighborhoods with concentrations of older building stock to focus outreach campaign.	Community Development; Sustainability Coordinator
D Work with PG&E to identify large-energy users that would benefit from energy audits. Leverage PG&E’s on-bill financing option for nonresidential and municipal customers.	Community Development; Sustainability Coordinator
E Partner with real estate professional groups to help educate home buyers and business owners about the benefits of energy audits at the point of sale.	Solano Center for Business Innovation; Sustainability Coordinator
F Provide links on the city website to PG&E’s do-it-yourself online energy audit program. (This information could be placed on a new Solano County Sustainability Webpage to leverage regional efforts.)	Community Development; Sustainability Coordinator

Measure E-1.3: Commercial Energy Conservation Ordinance

2020 GHG Reduction Potential: **17 MT CO₂e/yr**

2035 GHG Reduction Potential: **62 MT CO₂e/yr**

Adopt a Commercial Energy Conservation Ordinance (CECO) requiring energy audits and retrofits for nonresidential buildings of more than 25,000 sq ft to achieve an established building efficiency threshold at point-of-sale or major renovation. The ordinance would not apply to recently constructed or renovated buildings.



Measure Background

A CECO requires commercial property owners to install energy conservation measures in their buildings upon transfer of property ownership or when additions or renovations are made. CECO measures often save building owners money on monthly electricity and natural gas costs. The city will adopt a CECO for commercial properties of 25,000 sq ft or larger and either establish a building efficiency threshold which must be met through installation of building improvements chosen by the building owner or develop a checklist of mandatory installations. As described in Measure E-1.2, a building energy audit would help to identify the most cost-effective improvements to make if the city adopts an efficiency threshold and lets building owners decide how best to achieve it. Alternatively, the city could develop a CECO checklist for building inspectors that specifies what improvements will be made. For example, ceiling insulation will be installed to achieve a thermal resistance of R30, or all domestic water storage heaters will be insulated with an external insulation blanket rated at a minimum thermal resistance value of R6.

Efficiency upgrades are estimated to cost between \$1.00 and \$3.00 per square foot. The city will establish a cost ceiling relative to the sales price, over which additional improvements would not be required. Exemptions should be provided for newer construction or upgraded buildings, as these buildings likely already have higher energy efficiency than older buildings, as well as for properties that have already been upgraded and are resold within 5 years.

The expense of required improvements is expected to be absorbed into the building's purchase price and the mortgage, and is typically an acceptable expense for the purchaser considering the long-term savings. Financing options described in Measures E-1.1, E-3.1, and E-3.2 would reduce up-front costs to building owners.

This would be a self-enforcing program. Minimal city resources would be dedicated to inspection or verification. The city would implement the CECO in phases. Phase 1 would consist of a mandatory audit (carried out by private-sector auditors, as described in Measure E-1.2) and voluntary improvements, extending for a period of five years. The city will provide information on available rebates and financing options to encourage improvements identified in audits during Phase 1. Improvements identified in audits would become mandatory in Phase 2.

Action	Responsibility
A Adopt a Commercial Energy Conservation Ordinance requiring point-of-sale energy efficiency upgrades, and establish an efficiency threshold.	Building Division
B Partner with the Solano Center for Business Innovation to distribute information on available retrofit rebates and financing options to building owners subject to the CECECO.	Solano Center for Business Innovation

Progress Indicators	Year
185,000 sq ft of nonresidential area installs a comprehensive retrofit package	2020
700,000 sq ft of nonresidential area installs a comprehensive retrofit package	2035

E-2: New Construction

Measure E-2.1: New Construction Energy Efficiency

2020 GHG Reduction Potential: **20 MT CO₂e/yr**

2035 GHG Reduction Potential: *Included in Statewide Reduction Zero Net Energy Building Goal*

Encourage energy-efficient new construction through promotion of energy-efficient mortgages and technical assistance programs for developers.



Measure Background

California Building Energy Efficiency Standards (Title 24, Part 6, 2008) serve as the basis for mandatory building energy efficiency standards. The California Green Building Standards Code (CALGreen), effective in 2011, also provides the city with the option of adopting an energy efficiency standard that surpasses the State’s basic requirements. CALGreen outlines two options: Tier I requires a building’s energy performance to exceed Title 24 requirements by 15 percent, while Tier II increases this standard to 30 percent. Revisions to the Title 24 Standards will be adopted in 2013 and will go into effect in 2015.

Although a mandatory ordinance to exceed Title 24 Standards through adoption of the Tier I or II standards will not be established at this time, the city will develop a technical assistance program for local builders to provide information on green building practices, specifically those which relate to energy- and water-efficient design and construction practices. The Cities of Fairfield, Rio Vista, and Suisun City already have technical assistance programs, which could be used as models for Dixon’s efforts. PG&E also developed the Savings by Design program to encourage energy-efficient construction in

new commercial buildings. The program offers a range of services to building owners and their design teams, such as design assistance, design team incentives, owner incentives, and educational resources for customized new construction projects that exceed California's Title 24 energy efficiency standards.

To further encourage new construction to participate in this program, the city provides several green-building incentives described throughout this CAP, such as permit streamlining and reduced permit fees for installation of various technologies. The city will also consider developing a local green building recognition program to commend building owners that voluntarily exceed Title 24 Standards. The city will work with local real estate professional groups and area developers to provide information to home buyers about the benefits of energy efficiency mortgages, which allow homebuyers to finance the installation of energy efficient systems, such as solar photovoltaics or high-efficiency windows.

Action	Responsibility
A Develop a technical assistance program to serve as a resource on green construction practices for local builders. Research the programs at the Cities of Fairfield, Rio Vista, and Suisun City for local examples, as well as PG&E's Savings by Design program.	Building Division
B Partner with local developers and realtors to distribute informational brochures about energy efficient mortgages to potential new home buyers.	Building Division; Sustainability Coordinator
C Provide outreach to local developers, architects, and builders on PG&E's Savings by Design program.	Building Division
D Consider establishing a local green-building recognition award for exemplary projects.	Building Division; Sustainability Coordinator

Progress Indicators	Year
15 new single-family residential buildings exceed 2008 Title-24 by 30%	2020

Measure E-2.2: Solar Ready Construction

Supporting Measure – Not Quantified

Require pre-plumbing for solar hot water in all new residential construction.



Measure Background

Increasing the use of distributed renewable energy systems (e.g., rooftop solar photovoltaic) prevents the combustion of fossil fuels to generate electricity, thereby reducing GHG emissions. Dixon's location and geography result in a high solar insolation rating, which makes it an excellent candidate for effective adoption of solar

technologies. The city can encourage installation of solar technologies by requiring new construction to be pre-wired and pre-plumbed to support PV systems and solar hot water systems, which can reduce the cost of post-construction solar applications for homeowners. The city already requires solar pre-wiring, and will work with its Building Division to define pre-plumbing requirements that support solar hot water systems without imposing a financial barrier to new residential construction. Other California cities have adopted similar ordinances, including the Cities of Chula Vista and Rancho Palos Verdes.

Action	Responsibility
A Define requirements for solar pre-plumbing that minimize additional construction costs and are compatible with the city's existing solar pre-wiring requirements.	Building Division
B Promote the city's technical assistance program for developers to help implement this measure (see Measure E-2.1).	Building Division

E-3: Financing

Measure E-3.1: Energy Efficiency Rebate Program

Supporting Measure – Not Quantified

Consider establishing a city or county rebate program to encourage implementation of energy efficiency retrofits.



Measure Background

PG&E currently offers rebates for various home energy efficiency improvements. In addition to PG&E rebates, numerous programs funded by state agencies and local governments are available to Solano County residents through the Energy Upgrade California program. The city will partner with other Solano County governments and agencies to identify gaps in existing rebate and incentive programs and jointly pursue funding to establish a local (e.g., Solano County) rebate program.

New rebates could be structured to encourage residents to buy goods or services from local businesses. For example, the city could develop an ENERGY STAR-rated appliance rebate program to supplement those currently offered through PG&E, by providing an additional \$50 rebate for appliances purchased from local vendors. Alternatively, the new rebate program could be structured to address the building improvement needs of a specific building type, such as small commercial properties or multi-family residential buildings.

Action	Responsibility
A Identify rebate/incentive gaps in PG&E- and Energy Upgrade California-sponsored programs to identify local financing needs.	Community Development; Sustainability Coordinator
B Identify an outside funding source to finance rebate program (e.g., EECBG, ARRA).	Community Development; Sustainability Coordinator

Measure E-3.2: PACE Financing Program

Supporting Measure – Not Quantified

Partner with the County in its pursuit to establish the Clean Energy Solano PACE program that would provide financing options for residential and nonresidential energy efficiency upgrades to existing buildings. Work with other Solano County jurisdictions to jointly pursue bond funding for a commercial PACE program through California FIRST.



Measure Background

A property-assessed clean energy (PACE) finance program is enabled through the AB 811 legislation. This bill allows land-secured loans for homeowners and businesses who install energy efficiency projects and clean-energy generation systems. Senate Bill 555 reinforced implementation opportunities for PACE programs by expanding the scope of activities allowed within a community facilities district, as defined by the Mello-Roos Community Facilities Act of 1982. A PACE program permits property owners within participating districts to finance the installation of energy- and water-efficiency improvements in their home or business through a lien against their property that is repaid through their property tax bill. If the property is sold, payment responsibility transfers to the new owners, allowing building owners to avoid up-front installation costs while at the same time requiring little or no investment of local government general funds. In some instances, the new lender may require repayment of the existing lien, in which case the remaining PACE loan is repaid from the proceeds of the property sale.

Dixon is a participating member of the California FIRST program which allows PACE funding for commercial and multi-family residential projects. Dixon would also be within the boundaries of the proposed Clean Energy Solano PACE program, which would provide financing to both residential and nonresidential projects.

An initial market analysis for the proposed Clean Energy Solano program estimated 3.5% participation in the first five years from both the residential and nonresidential sectors, which would lead to local economic benefits including approximately \$19 million in state and local tax revenue, the creation of 2,700 new jobs, and the generation of 37 MW of local renewable energy. Furthermore, building owners who participate in the PACE program are not required to front the initial capital costs.

Action	Responsibility
A Opt into the County's PACE program as a participating member.	Community Development; Sustainability Coordinator; Solano EDC
B Develop an outreach program describing available PACE financing options. Work with PG&E to identify large energy users to help focus outreach efforts.	Community Development; Sustainability Coordinator
C Continue to participate in California FIRST to make PACE financing available to commercial, industrial, multi-family residential (5+ units), and nonprofit-owned buildings.	Community Development; Sustainability Coordinator

E-4: Building Appliances

Measure E-4.1: ENERGY STAR Appliances

2020 GHG Reduction Potential: 33 MT CO₂e/yr

2035 GHG Reduction Potential: 68 MT CO₂e/yr

Promote voluntary installation of ENERGY STAR and other high-efficiency appliances.



Measure Background

As Title 24 Standards require building shells and systems to become even more efficient, energy consumption from appliances and electronics will become an increasingly important source for reducing building energy use and residents' utility bills. In 2009, approximately 28% of statewide residential electricity use was dedicated to appliances. Televisions, computers, and home office equipment accounted for an additional 20% of electricity use.^v As big-screen televisions, smart phones, tablets, and other electricity-consuming devices become more commonplace in homes, their proportional share of home electricity use will likely increase as well. Installing ENERGY STAR appliances is one way to reduce energy use in this sector.

This measure is designed to encourage voluntary community participation to upgrade home appliances and lighting to ENERGY STAR or other energy efficient models. Successful implementation of this measure relies on leveraging the Energy Upgrade California program materials through a public outreach campaign to increase community awareness regarding energy efficient appliance choices. The ENERGY STAR rating is an internationally recognized standard for energy efficient consumer products. According to the EPA, devices that have an ENERGY STAR certification, such as office equipment, home appliances, and lighting products, generally use 20 to 30 percent less energy than required by federal standards. By promoting ENERGY STAR-rated home and business appliances, the city can help to reduce GHG emissions related to the use of

lighting, refrigerators, dishwashers, clothes washers, wall air conditioning units, computers, photocopiers, lights, and other appliances.

Through Energy Upgrade California, PG&E currently offers rebates to customers who purchase ENERGY STAR dishwashers, clothes washers, refrigerators/freezers, ceiling fans, pool pumps, and room air conditioners. The city will partner with PG&E, Solano County Water District, local developers, and other relevant organizations to promote existing financial incentives and rebates for energy-efficient appliance upgrades and replacements.

Action	Responsibility
A Collaborate with PG&E, Solano County Water District, and other local organizations to promote existing financial incentive programs to encourage voluntary replacement of inefficient appliances with new ENERGY STAR appliances.	Community Development; Sustainability Coordinator
B Provide outreach to local developers regarding sources of available rebates to encourage installation of ENERGY STAR-rated major appliances in new residential construction.	Building Division; Sustainability Coordinator

Progress Indicators	Year
New residential construction installs energy-efficient appliances: 200 refrigerators; 250 clothes washers; 300 dishwashers; Existing residential units replace expired appliances with energy-efficient appliances: 1,500 refrigerators; 2,700 clothes washers; 3,800 dishwashers	2020
New residential construction installs energy-efficient appliances at the following rates: 950 refrigerators; 850 clothes washers; 600 dishwashers; Existing residential units replace expired appliances with energy-efficient appliances: 2,500 refrigerators; 4,000 clothes washers; 5,000 dishwashers	2035

Measure E-4.2: Smart Grid

2020 GHG Reduction Potential: **216 MT CO₂e/yr**

2035 GHG Reduction Potential: **426 MT CO₂e/yr**

Encourage adoption of smart grid-compatible appliances and energy management systems to shift peak-load energy use.



Measure Background

The 'smart grid' is an emerging energy management system which uses information technology to significantly improve how electricity is managed and controlled. Smart meters, which use a technology that enables users to take full advantage of the smart grid, will eventually provide utility customers with access to detailed energy use and cost information, new time-of-use pricing programs based on peak-energy demand, and

the ability to program home appliances and devices to respond to energy use preferences based on cost, comfort, and convenience.

Current smart meters allow for frequent remote reading of energy usage by PG&E. However, the true value of the smart meter program will be fully realized when community residents and businesses begin making more informed energy use decisions based on the two-way communication enabled by smart meters, such as when a homeowner is able to program their washing machine to run when energy prices are lowest.

All California investor-owned utilities are rolling out time-of-use pricing, which offers lower utility rates to customers that switch discretionary energy use to off-peak times. Time-of-use pricing is mandatory for all commercial customers, and will eventually be offered to residential customers as well. PG&E currently offers the SmartRate pricing plan to residential customers, which offers lower prices per kWh to customers that agree to reduce electricity use on “SmartDays” when intense heat drives up air conditioning use and therefore, electricity prices. PG&E has also joined OPower, a social media technology provider that helps customers using smart grid technology to compare their energy use with neighbors. To support use of their various pricing programs, PG&E created the Green Button Connect program to allow customers to share their energy usage data with third-party app developers that already have products to help customers track and manage their energy use. The assumption is that customer access to their own energy use trends will support behavioral changes to energy consumption, which will lower customers’ utility bills and lower PG&E’s costs to provide energy.

When estimating the potential GHG emission reductions associated with implementation of the smart grid, the city included the energy efficiency improvements gained from integrating smart grid energy management systems for control lighting, heating, ventilation, and air conditioning and other major appliances in residential and commercial buildings. According to CISCO, a world-wide leader in network technology, full integration of the smart grid will take time to realize, but energy analysts estimate it will ultimately be capable of reducing electricity-related GHG emissions by 30 percent below current levels.

Through public outreach efforts and targeted outreach to the development community, the city will promote voluntary adoption of smart-grid technology for homes and businesses. The city will train Building Division staff on the benefits of smart-grid integration and provide informational materials on existing rebate programs.

Action	Responsibility
A Develop an outreach program that leverages existing PG&E materials, including description of the O-Power Program. Make information available at Building Division counter.	Building Division; Sustainability Coordinator
B Identify and advertise available rebates for smart-grid compatible appliances and systems on the County’s Sustainability Website.	Building Division; Sustainability Coordinator

Progress Indicators	Year
725 residential units install smart-grid compatible appliances and systems; 615,000 sq ft of commercial area installs smart-grid compatible appliances and systems	2020
1,600 residential units install smart-grid compatible appliances and systems; 1.3 million sq ft of commercial area installs smart-grid compatible appliances and systems	2035

Measure E-4.3: Permanent Load Shift

Supporting Measure – Not Quantified

Encourage participation in PG&E's Permanent Load Shift program to shift thermal cooling loads to off-peak and/or partial-peak hours.



Measure Background

PG&E's Permanent Load Shift program, often referred to as "Shift & Save," is to store thermal cooling capacity during off-peak hours and/or partial-peak hours in order to meet thermal cooling load in subsequent on-peak hours. The goal of this program is to shift 3.9 megawatts of load. The program's targeted customers are bundled service, commercial, industrial, agricultural, and large residential customers in PG&E's electric service territory. PG&E is working with Cypress Ltd. and Trane USA to implement this program.

The city will partner with PG&E to identify and provide outreach to local large-energy users that could financially benefit from participation in the program. The city will partner with the Solano Center for Business Innovation and the Solano Economic Development Corporation in its outreach activities to find regional efficiencies in program expansion and application in other Solano County cities. A statewide Permanent Load Shift technology incentive program is currently under development; the city should monitor its progress to identify opportunities for local application.

Action	Responsibility
A Work with PG&E to identify large-energy users that would benefit from peak-load shifting technologies and/or strategies. Targeted customers are bundled service, commercial, industrial, agricultural, and large residential customers.	Building Division; Sustainability Coordinator
B Monitor development of the statewide Permanent Load Shift program to identify opportunities for local application.	Building Division; Sustainability Coordinator

E-5: Building Cooling

Measure E-5.1: Building Shade Trees

2020 GHG Reduction Potential: **29 MT CO₂e/yr**

2035 GHG Reduction Potential: **43 MT CO₂e/yr**

Adopt a shade tree ordinance for new construction and develop a shade tree outreach campaign to encourage existing property owners to voluntarily plant shade trees.



Measure Background

Properly located trees can provide shading for residential and commercial buildings, and thereby reduce the need for air conditioning. The capacity of a tree to reduce GHG emissions is dependent on its age and species. As trees mature, their canopies increase in size and provide higher levels of shade and greater levels of building cooling in hot weather. Large, deciduous species are ideal for reducing building energy use as they provide shade in summer, but allow winter sunlight into buildings for passive solar gain in cooler weather. Additionally, trees gain carbon-capturing biomass in their trunks and roots as they absorb carbon from the air to grow.

The city will adopt a shade tree ordinance that requires new single-family residential units to plant two shade trees, and new multi-family residential buildings and new nonresidential buildings to plant one shade tree per 1,000 sq ft of air conditioned floor space. The ordinance will allow the installation of building-integrated vegetation in lieu of shade trees. The city will also work with local organizations to promote voluntary shade tree planting at existing buildings. To facilitate proper implementation of this measure, the city will develop a shade tree planting guide to instruct home builders, developers, landscapers, building managers, and property owners on proper shade tree selection and placement to maximize building cooling opportunities while preserving solar access on the roof. Planting guidance should describe the selection of climate-appropriate species and proper siting specifications (i.e., S, SW, or W side of buildings; no more than 20' from the building).

Action	Responsibility
A Amend the city's Development Standards per the new shade tree ordinance.	Planning Division
B Work with local environmental and conservation groups to advertise the various benefits of planting shade trees near existing buildings.	Building Division
C Develop a shade tree planting guide to facilitate proper tree selection and installation.	Building Division; Recreation & Community Services

Progress Indicators	Year
1,775 new shade trees properly installed (does not include replacement trees for existing shade trees)	2020
2,700 new shade trees properly installed (does not include replacement trees for existing shade trees)	2035

Measure E-5.2: Cool Roofs

2020 GHG Reduction Potential: **38 MT CO₂e/yr**
 2035 GHG Reduction Potential: *Included in Statewide Reduction Zero Net Energy Building Goal*

Develop a cool roofs program to encourage the installation of cool roof technology in residential buildings.



Measure Background

The urban heat island effect describes the phenomena in which urban areas are hotter than nearby rural areas. Urban heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and GHG emissions, and heat-related illness and mortality. 'Cool roofs' are made of materials with higher solar reflectivity, which mitigate the urban heat island effect and reduce cooling loads during hot days. In contrast, dark roofs absorb heat from the sun, which elevates urban temperatures and increases demand for air conditioning.

According to the EPA, the cost premium for cool roofs versus conventional roofing materials ranges from zero to 10 cents per square foot for most products, or from 10 to 20 cents per square foot for a built-up roof with a cool coating used in place of smooth asphalt or aluminum coating. According to PG&E, customers with cool roofs reduce their air conditioning usage by an average of 10 to 20 percent, which can reduce their electric bill by five to 10 percent during the warm summer months.

Per the 2005 Title 24 standards, cool roofs are already required in new nonresidential construction and retrofits with low-sloped roofs, in most cases. Cool roofs are also required for projects seeking to comply with Tier I or Tier II energy standards under CALGreen (Section A4.304.4 for residential and A5.304.4 for nonresidential).

As financing is critical to the success of the cool roof program, the city will promote the financing programs and resources described in other measures (e.g., PACE financing), and make residents aware of federal and PG&E rebate programs when they file paperwork for a reroof project or pull permits for new construction. In previous years, federal tax credits have been available for the installation of ENERGY STAR cool roof products. PG&E offers a rebate program for residential cool roof installation, which as of 2012 was set at \$0.20/square foot.

The city will also provide expedited plan check and refund 50% of roofing permit fees for residents that voluntarily install a cool roof. Given the availability of refunds and

incentives to help cover the price premium of cool roofs over conventional roofing systems, a high rate of participation is expected in this program.

Action	Responsibility
A Implement expedited plan check and roofing permit fee refunds for qualifying roof systems. Encourage active roof technologies and installation of solar panels at time of reroofing.	Building Division
B Leverage existing cool roof rebates offered by PG&E and federal tax credits for ENERGY STAR-compliant cool roof systems.	Community Development

Progress Indicators	Year
480 residential cool roofs installed	2020

E-6: Building Lighting

Measure E-6.1: Indoor Lighting Efficiency

2020 and 2035 GHG Reduction Potential: See *Statewide Reduction AB 1109*

Encourage voluntary adoption of efficient indoor and outdoor lighting technologies in residential and nonresidential buildings.



Measure Background

According to the 2009 California Residential Appliance Saturation Study, approximately 20% of residential electricity consumption is attributed to lighting.^{vi} In nonresidential buildings, conventional commercial lighting, including T12 fluorescent bulbs and old exit sign lights, consume more energy than new T8 lights and light-emitting diode (LED) technologies. Lighting upgrades typically provide a short payback period for their investment, and are a good source of GHG emissions reductions.

The city will provide outreach and technical assistance to nonresidential property owners to encourage participation in PG&E’s lighting upgrade program, which includes rebates for fixtures, lamps, accent/directional lighting, controls, and signage. The city will also provide outreach to multi-family property managers regarding lighting rebates through PG&E, including CFL replacement bulbs, activity sensors and timers, and replacing T-12 lamps with magnetic ballasts. Informational materials should demonstrate the simple-payback period associated with lighting improvements (typically 2-4 years). The city will also advertise PG&E’s CFL rebate, or other lighting rebate programs, on the new sustainability website.

Action	Responsibility
<p>A Develop lighting-efficiency informational materials that demonstrate the simple-payback period associated with lighting improvements and existing rebates. Post information on the Solano County Sustainability Webpage. Provided targeted outreach to large nonresidential building managers and multi-family property managers.</p>	<p>Building Division; Sustainability Coordinator</p>
<p>B Leverage existing energy-efficient lighting rebate programs offered through Energy Upgrade California, including fixture and lamp replacements/installation, accent and directional lighting, security lighting, lighting control systems, and PG&E's residential CFL rebate program.</p>	<p>Solano Center for Business Innovation; Sustainability Coordinator</p>
<p>C Encourage small businesses to participate in PG&E programs that provide technical assistance and access to incentives for energy efficiency upgrades (e.g., lighting).</p>	<p>Solano EDC</p>

E-7: Renewable Energy

Measure E-7.1: Solar Photovoltaic Systems

2020 GHG Reduction Potential: **1,447 MT CO₂e/yr**

2035 GHG Reduction Potential: **2,687 MT CO₂e/yr**

Facilitate the voluntary installation of solar PV systems on residential and nonresidential buildings.



Measure Background

Solar photovoltaic (PV) systems generate electrical power by converting solar radiation into direct current electricity using semiconductors. PV power generation employs solar panels composed of cells containing photovoltaic material. PV systems can be retrofitted into existing buildings, usually by mounting them on an existing roof structure or walls. Dixon's solar potential is approximately 5.1 kWh/m²/yr, which is sufficient to support a solar PV installation that would cover a large percentage of an average home's electricity demand.^{vii} In addition to residential rooftops, commercial and industrial rooftops tend to have large, flat roofs that are often well-suited for solar photovoltaic (PV). Parking lots also provide excellent opportunities for additional solar energy generation. According to PG&E data, Dixon contains nearly 100 residential solar PV systems installed since 2005, with a total capacity of approximately 550 kW. The city also contains nonresidential solar PV systems totaling an additional 1.6 MW.^{viii} However, numerous barriers may prevent widespread adoption of solar PV technology, including city regulations, up-front costs, misinformation or lack of information.

Financing is critical to the success of the solar PV program. Property owners will be able to finance their PV systems through various financing programs and rebates. As described in Measure E-3.2, the city will support the development of and participation

in two PACE programs to further promote renewable energy systems for residential and nonresidential buildings. Other financing models, such as power purchase agreements (PPAs), can be used to offset the initial capital cost of installing a solar PV system. Solar PV rebates are available through the California Solar Initiative and its related programs: New Solar Homes Partnerships, Multifamily Affordable Solar Housing Program, and Single-Family Affordable Solar Housing Program. Rebate amounts vary, and are typically based on the installed system size and expected performance. Some rebate programs have variable rebate steps, which decline as PV installed capacity increases.

The city will develop a comprehensive solar PV program that encourages homeowners to install PV systems through outreach advertising available rebate and incentive programs. Outreach efforts will aim to maximize community participation from homeowners, builders, and businesses by leveraging existing educational materials and links to technical assistance and rebates and financing programs. The city will encourage homeowners to request free solar PV audits provided by private solar financing and installation companies. The city will also review and revise its zoning and building codes and other applicable ordinances to identify and remove regulatory barriers to solar installations (i.e., PV and solar hot water) on residential and nonresidential properties. The city has already reduced permitting fees associated with rooftop solar PV installation, and will offer priority permitting for new solar PV systems to further reduce implementation barriers.

Action	Responsibility
A Review/revise all applicable building, zoning, and other codes and ordinances to identify and remove potential regulatory barriers to the installation of solar PV or solar hot water systems in residential and nonresidential construction.	Building Division
B Provide priority permitting for building-scale renewable energy projects.	Building Division; Sustainability Coordinator
C Reduce solar PV permitting fees.	Building Division; Sustainability Coordinator
D Develop a comprehensive outreach campaign to increase voluntary participation in solar PV installation programs, including a directory of existing rebates/incentive programs, explanation of simple-payback calculations for solar PV systems, and technical assistance. Leverage existing solar PV informational materials from Energy Upgrade California, the California Solar Initiative, and PG&E.	Building Division; Sustainability Coordinator
E Develop informational materials about the benefits of PPAs offered through independent solar service providers. Post on the Solano County Sustainability Website, and make printed copies available at the Planning Department and Building Division counters.	Building Division; Sustainability Coordinator

Progress Indicators	Year
525 single-family units install 4.5kW PV system 3.7 MW capacity installed on nonresidential and multi-family buildings	2020
725 single-family units install 4.5kW PV system 8.5 MW capacity installed on nonresidential and multi-family buildings	2035

Measure E-7.2: Solar Water Heaters

2020 GHG Reduction Potential: **49 MT CO₂e/yr**

2035 GHG Reduction Potential: **255 MT CO₂e/yr**

Promote voluntary installation of solar water heaters in new construction and building retrofits through outreach campaign.



Measure Background

The effectiveness of a solar installation is described, in part, by its solar savings fraction (solar fraction). This measurement describes the percentage of a building's total energy demand that can be met through installation of a solar energy system. A 0% solar fraction indicates that no solar energy utilization is possible, while 100% would indicate full utilization of solar energy to meet building energy demand. Dixon has a 65% solar fraction for low-rise buildings (i.e., 1-2 stories) and a 46% solar fraction for multistory structures (i.e., 3 or more stories), indicating good potential for solar water heater applications.^{ix}

Solar water heating systems are a simple, reliable, and cost-effective method for harnessing the sun's energy to provide for hot water needs. Solar collectors, usually placed on the roof, absorb the sun's energy to heat water that is stored in a water tank. The State of California has recognized the value of solar hot water heaters. The California Solar Water Heating and Efficiency Act of 2007 (AB 1470), created a 10-year program aimed at installing solar water heaters in homes and businesses. AB 1470 was designed to lower the initial costs of purchasing a system, which averages around \$3,000-\$6,000.

Solar hot water systems can also be a cost-effective replacement for inefficient water heaters. According to the California Solar Initiative (CSI), solar hot water systems can lower energy bills by meeting 50 to 80 percent of hot water needs over a year. Though the high capital cost of solar water heater upgrades can pose a financial burden to homeowners, there are a range of financing and rebate options to offset these initial investment costs.

There are a number of financing options that may be used to reduce upfront costs, such as the PACE programs mentioned in Measure E-3.2, federal tax incentives through the Energy Policy Act of 2005, and financial incentives through the CSI-Thermal Program. Similar to the CSI solar rebate programs, the CSI-Thermal Program provides rebates for solar water heaters that decline in value as installation increases.

The Solar Water Heating Pilot Program, operated through San Diego Gas and Electric from 2007-2010, identified numerous barriers to the widespread adoption of solar water heating systems. In particular, participating contractors named permitting and inspection costs and delays as a primary obstacle to widespread adoption for single-family residential buildings because non-material costs represented approximately 65% of total system costs. That means, only 35% of total costs were related to the actual system price. To help address this problem, the city will reduce permitting fees for solar hot water heater systems and will work to streamline the permitting process.

The city will also work with PG&E to create outreach opportunities that provide information about the financial benefits of solar hot water heaters, describe existing financing options and rebate programs, and explain the city’s efforts to encourage participation.

Action	Responsibility
A Collaborate with PG&E and the California Solar Initiative - Thermal Program to develop an outreach program to maximize installation of solar hot water systems and leverage existing funding opportunities.	Community Development; Sustainability Coordinator
B Streamline permitting process (e.g., building, electric, plumbing) for solar hot water system installation.	Building Division
C Provide priority permitting for building-scale renewable energy projects.	Building Division
D Reduce solar hot water heater permitting fees.	Building Division

Progress Indicators	Year
50 single-family residential units install solar hot water system; 10 multi-family units are served by solar hot water system	2020
275 single-family residential units install solar hot water system; 40 multi-family units are served by solar hot water system	2035

Measure E-7.3: Residential Renewable Energy Requirements

2020 GHG Reduction Potential: 754 MT CO₂e/yr

2035 GHG Reduction Potential: 1,633 MT CO₂e/yr

Require all new residential construction to include solar water heaters, to the fullest extent possible, and require all new single-family residential construction to include a 4.5 kW solar PV system.



Measure Background

Increasing the use of distributed renewable energy systems (e.g., rooftop solar photovoltaics) prevents the combustion of fossil fuels to generate electricity, thereby reducing GHG emissions. Dixon’s location and geography result in a high solar insolation rating, which makes it a good candidate for effective adoption of solar technologies.

To increase local renewable energy generation, the city will require new single-family residential homes to include a 4.5 kW solar photovoltaic system, and all new residential construction to install solar water heaters, to the fullest extent possible.

As described in Measures E-7.1 and E-7.2, numerous financing options and rebate programs are available to offset the cost of these systems. Additionally, because new

construction will be built to higher efficiency standards than existing buildings, the required PV systems will provide a greater share of total building energy demand.

Reductions associated with this measure are in addition to those shown for measures E-7.1 and E-7.2.

Action	Responsibility
A Adopt an ordinance requiring all new residential construction to include solar water heaters.	Building Division
B Adopt an ordinance requiring new single-family residential construction to include 4.5 kW solar PV systems.	Building Division
C Direct homebuilders to sources for rebates/incentives, including PG&E, the California Solar Initiative, Energy Upgrade California, and the US EPA.	Building Division; Sustainability Coordinator

Progress Indicators	Year
410 single-family units install 4.5 kW PV system 465 residential units are served by solar water heating system	2020
820 single-family units install 4.5 kW PV system 875 residential units are served by solar water heating system	2035

Measure E-7.4: District Energy Systems

Supporting Measure – Not Quantified

Encourage incorporation of district energy systems in new industrial growth areas that include on-site, or are located near, waste heat generation facilities.



Measure Background

District energy systems can provide a platform for utilizing waste heat and renewable energy sources and moving these resources around in a system to where and when they are most needed. Waste heat is generated through a variety of industrial processes, and can be captured and used as a heat source for buildings or to power other industrial processes.

District energy systems constructed to offset building heating loads require extensive infrastructure to capture heat from its waste source and deliver it to end users (e.g., residences, office buildings). In colder regions, the proportion of energy costs dedicated to space heating can be very high, which makes this type of system economically viable. Given the relatively low space heating demands in Dixon, an extensive district energy system is not financially feasible. However, the city could identify its waste heat generators and attempt to attract compatible waste heat users that would benefit from the free use of process heat.

The city will work with the Solano Economic Development Corporation (EDC) to identify the thermal capacity of waste heat generators in Dixon, and identify the types of industries that could beneficially use that type of heat in their processes. Should district energy systems prove to be a viable tool for local economic development, the city will work to remove any regulatory barriers to system installation.

Action	Responsibility
A Inventory and assess existing sources of waste heat in the city.	Solano EDC; Sustainability Coordinator
B Remove regulatory barriers to the installation/evolution of district energy networks.	Public Works; Building Division
C Prepare educational and outreach materials with which to communicate Dixon’s district energy opportunities to potential developers or other stakeholders.	Community Development; Solano EDC
D Work with Solano EDC to attract waste heat users (e.g., agricultural drying facilities) that can be co-located near waste heat generators.	Community Development; Solano EDC

Measure E-7.5: Community Choice Aggregation

2035 GHG Reduction Potential: See *Progress towards 2035 Target* discussion at end of chapter

Support the county in its efforts to develop a community choice aggregation program to provide Solano County residents with a choice in their energy provider.



Measure Background

Solano County included a measure in its CAP to investigate the potential for a countywide community choice aggregation program (CCA).

Assembly Bill 117, which was signed into law in 2002, enables California cities and counties, either individually or collectively, to supply electricity to customers within their borders through the establishment of a CCA. Unlike a municipal utility, a CCA does not own the transmission and delivery systems, but is responsible for providing electricity to its constituent residents and businesses. The CCA may own electric generating facilities, but more often, it purchases electricity from private electricity generators.

A key benefit of a CCA is that the participating jurisdictions can determine the amount of renewable energy contained within the generation portfolio. For example, a Solano County CCA could decide to provide 50% of its electricity from renewable sources, which would exceed state requirements directing California’s utilities to provide 33% of their electricity from renewable sources by 2020.

Developing a CCA will require a detailed analysis of energy demand, efficiency opportunities, and renewable generation opportunities in Solano County. Using existing models from other counties (e.g., Marin County) is likely to reduce the initial program design costs. The program would be most effective if the city partnered with other Solano County cities and the county government to jointly pursue a CCA program.

The city will work with the county and other interested participants in the preparation of feasibility studies, outreach campaigns, and other efforts to develop a countywide CCA.

Action	Responsibility
A Work with the county to prepare necessary study reports, informational materials, and any other supporting research and/or documents to help pursue a CCA program.	Sustainability Coordinator

E-8: Street and Area Lighting

Measure E-8.1: Street Light Upgrade

2020 GHG Reduction Potential: **58 MT CO₂e/yr**
 2035 GHG Reduction Potential: **58 MT CO₂e/yr**

Partner with PG&E to upgrade existing street lights to LED, induction, or other energy-efficient technology. Require new street lights to use energy-efficient technology.



Measure Background

Streetlights account for approximately 31% of the city’s municipal electricity use.^x High-pressure sodium bulbs, commonly used in streetlights, require more energy and have a shorter lifespan than new induction and/or light-emitting diode (LED) lights. The short simple-payback period associated with lighting upgrades makes this an easy measure to implement.

The city has already undertaken a pilot program to upgrade streetlights to LED, and is pursuing a grant to fund citywide upgrades. The city has also explored funding options through PG&E and the California Energy Commission. When funding is secured, the city will upgrade streetlights citywide. The city will also update its streetlight standards to require energy-efficient streetlights for new and replacement installations.

Action		Responsibility
A	Revise the city's street lights standards to include requirements for energy-efficient technology in new and replacement lamps.	Public Works
B	Develop a street light upgrade program that identifies funding sources and an implementation phasing schedule.	Public Works

Progress Indicators	Year
100% of HPS bulbs are replaced with energy-efficient technology	2020 and 2035

Measure E-8.2: Traffic Signal Upgrade

2020 GHG Reduction Potential: **1 MT CO₂e/yr**

2035 GHG Reduction Potential: **1 MT CO₂e/yr**

Reduce energy consumption in the city's traffic signals through installation of energy-efficient lighting technology.



Measure Background

The city has already begun to replace the incandescent bulbs in traffic signals with LED bulbs. The city will continue to use LED bulbs or similar technology in new and existing traffic signals.

Action		Responsibility
A	Ensure that all new and existing traffic signals are installed with energy-efficient technology. Continue to monitor advancements in traffic signal technology that could provide additional cost-effective energy savings.	Public Works

Progress Indicators	Year
100% of incandescent bulbs in traffic signals are replaced with energy-efficient technology	2020 and 2035

Measure E-8.3: Parking Lot Lighting Upgrade

2020 GHG Reduction Potential: **13 MT CO₂e/yr**

2035 GHG Reduction Potential: **33 MT CO₂e/yr**

Develop a parking lot light upgrade pilot program to test available energy-efficient lighting technologies at a municipally-owned parking lot. Upon completion of the pilot program, expand the program to all municipally-owned parking lots. Promote lighting efficiency upgrades at private parking lots.



Measure Background

High-quality parking lot lighting is necessary to provide personal safety and deter theft and vandalism. However, conventional parking lot lighting, including high-wattage metal halide and high-pressure sodium lights, consumes more energy than new light-emitting diode (LED) technologies, which provide comparable lighting quality at a fraction of the energy consumption.

The city will develop a pilot parking lot lighting upgrade program to reduce electricity use at municipal parking lots. Upon completion of the pilot testing, the city will develop an implementation plan upgrade all municipal parking lot lights to energy efficiency technology. To finance the program, the city could contract with an Energy Service Company (ESCO) to perform parking lot lighting energy audits and identify best available retrofit improvements. In most cases, the ESCO pays up-front costs associated with retrofit installation, further reducing financial risk to the city.

The city will also work with the Solano Center for Business Innovation to provide outreach to local businesses about the simple-payback period associated with parking lot lighting upgrades. Informational materials could include financial characteristics of the city's pilot program and potential resources for financing or rebates. PG&E's *Lighting Rebate Catalog* provides a comprehensive source for exterior lighting rebates, including fixtures and bulbs.

Action	Responsibility
A Identify a funding source for pilot program.	Public Works
B Identify a pilot project parking lot, and monitor before and after energy consumption levels.	Public Works
C Develop outreach materials explaining simple payback period for pilot project, and available funding sources (e.g., PG&E, energy performance contracts).	Solano Center for Business Innovation; Sustainability Coordinator
D Develop outreach campaign to encourage private parking lot owners to voluntarily upgrade their lighting technology by explaining the simple pay-back period for investments and providing a list of available rebates/incentives.	Solano Center for Business Innovation; Sustainability Coordinator

Progress Indicators	Year
10% of parking lot lights are upgraded from HPS to energy-efficient technology	2020
25% of parking lot lights are upgraded from HPS to energy-efficient technology	2035

E-9: Municipal Actions

Measure E-9.1: Municipal Renewable Energy Development

2020 GHG Reduction Potential: **86 MT CO₂e/yr**

2035 GHG Reduction Potential: **86 MT CO₂e/yr**

Continue to explore opportunities for additional future installations of renewable energy facilities on municipal properties (e.g., landfills, wastewater treatment facilities, building rooftops).



Measure Background

Transitioning to clean energy sources will allow Dixon to reduce communitywide emissions. The installation of renewable energy systems on municipal buildings will show the city's leadership in the area of renewable energy generation. To that end, the city has already taken steps towards adopting solar technology.

The City of Dixon has partnered with First Northern Bank and Belvedere Equipment Finance Corporation to install five independently interconnected solar PV systems located across four municipal properties:

- + City Hall
- + Fire Department
- + Police Department
- + Hall Park (Pat Granucci Aquatic Center/Senior Center/Irrigation Pump)

The systems total approximately 380 kW of renewable capacity.

The city will continue to monitor funding sources and financing options that would allow for additional renewable energy development on municipal properties, particularly future developments related to small-scale wind funding programs. Should funding become available, the city will identify potential locations for new renewable facilities and conduct feasibility studies.

Action		Responsibility
A	Continue to monitor availability of small-scale wind turbine funding sources to replace retired PG&E program.	Community Development; Sustainability Coordinator; Solano EDC
B	When new funding sources become available, conduct feasibility study to identify potential sites for additional renewable energy generation and associated costs.	Public Works
C	Collaborate with other Solano County jurisdictions to identify best practices for municipal renewable facilities and funding strategies.	Public Works

Progress Indicators	Year
Maintain use of existing solar PV systems (380 kW)	2020
Maintain use of existing solar PV systems (380 kW)	2035

Measure E-9.2: Municipal Building Energy Efficiency

2020 GHG Reduction Potential: **45 MT CO₂e/yr**

2035 GHG Reduction Potential: **53 MT CO₂e/yr**

Establish a goal to reduce business-as-usual electricity use in municipal buildings by 15% below baseline 2005 levels.



Measure Background

Reducing municipal energy use will reduce communitywide GHG emissions, save taxpayer dollars, and set an example for the successful implementation of energy-saving technology.

To achieve 15% reductions in energy use the city will review its existing study, which identified ways to reduce municipal energy consumption. As described throughout this chapter, numerous financing options and rebate programs are available to fund energy-efficiency improvements. The city could also explore energy saving performance contracts to finance improvements. Under this type of agreement, an Energy Services Company (ESCO) completes building energy audits to identify the most cost-effective retrofit options. The ESCO guarantees the amount of energy that will be saved under a defined retrofit package, and further guarantees that the value of energy savings would be sufficient to cover efficiency upgrade costs as long as the price of energy does not fall below a stipulated floor price. In most cases, the ESCO pays up-front costs associated with retrofit installation, further reducing financial risk to the city.

In addition to addressing building performance, the city could provide information and training to city employees on how to reduce energy consumption in the workplace. The city could conduct one campaign per year, ideally during National Energy Awareness Month in October, to educate employees about their energy consumption at work and ways to reduce consumption (e.g., turning off computers and monitors, turning off

lights, using power strips). To incentivize participation, the city could consider advertising energy consumption trends during the campaign period and provide prizes for quantifiable reductions.

Action	Responsibility
A Identify near-term actionable items for energy conservation from the city's previously prepared report.	Building Division; Public Works
B Consider using an energy performance contract to finance efficiency retrofits.	Public Works
C Conduct city employee energy use reduction campaign and incentivize participation.	Public Works; Sustainability Coordinator

Progress Indicators	Year
Municipal building energy use is reduced by 342,000 kWh/yr	2020
Municipal building energy use is reduced by 400,000 kWh/yr	2035

Measure E-9.3: Wastewater Treatment Plant Process Optimization

2020 GHG Reduction Potential: **170 MT CO₂e/yr**
 2035 GHG Reduction Potential: **170 MT CO₂e/yr**

Perform wastewater treatment plant process energy audits to identify areas for efficiency improvements in machinery and plant operation.



Measure Background

The City of Dixon can improve the efficiency of wastewater pumping and treatment facilities by identifying and implementing energy-saving retrofits at the Dixon Wastewater Treatment Plant (DWTP).

PG&E performs Integrated Energy Audits of wastewater treatment facilities to identify the most critical efficiency improvements and help sewer districts to select energy-saving projects and identify available financial incentives. PG&E helped the Fairfield Suisun Sewer District (FSSD) to save 1.3 million kWh/yr and install wind turbines with a 200 kW capacity. FSSD received \$350,000 in incentives from PG&E, contributing to a simple-payback of 2.7 years for its energy efficiency projects.^{xi}

The city should work with PG&E to complete an energy audit of the DWTP, and identify cost-saving energy efficiency upgrades and financial incentives. Upon successful completion of its first energy audit, the city should budget for regular energy audits to ensure DWTP is operating efficiently.

Action	Responsibility
A Coordinate with PG&E to perform an Integrated Energy Audit on wastewater treatment plant operations.	Public Works; DWTP
B Update the Wastewater Facilities Plan to include regular energy audits and progress monitoring for implemented improvements.	Public Works; DWTP

Progress Indicators	Year
Reduce energy use at DWTP by 1.3 million kWh/yr from 2005 business-as-usual	2020 and 2035

Transportation + Land Use Strategy

Transportation-related emissions make up approximately 40% of the communitywide 2005 emissions inventory. Vehicle fuel efficiency, fuel carbon content, and vehicle operations, all influence the amount of transportation emissions generated in a community. However, these emissions are largely generated by the number of vehicle miles traveled (VMT) by residents and employees. Long vehicle trips and high numbers of trips create higher emissions.

While state-mandated technological changes in fuel efficiency and reductions in fuel carbon content will help reduce transportation emissions, significant reductions will require local action. Eliminating or shortening vehicle trips is made possible through increasing alternative transportation options, such as transit, bicycling, or walking, and through the distribution of diverse land uses relative to transportation options.

The transportation and land use strategy includes efforts to improve pedestrian mobility to encourage walking between nearby destinations and accommodate non-automotive circulation. Enhancing the bicycling network and improving access to transit stops also support alternative transportation options.

Where people live, work, shop, and play also determines how far they have to travel daily, and whether they choose to walk, bike, use public transit, or drive. Measures that support mixed land uses and opportunities for higher-density development along existing transit routes are essential to supporting alternative transportation options.

Facilitating a transition to alternative fueled vehicles and managing daily traffic demand can also reduce emissions. This includes incorporating alternative fueled vehicles in the municipal fleet, providing charging and refueling stations for alternative fueled vehicles communitywide, and assisting local businesses with automobile travel reduction efforts.

Emissions reductions from the transportation and land use strategy total 663 MT CO₂e/yr in 2020. This represents approximately 3% of total CAP measure reductions. While local transportation reduction estimates may appear low as compared to the proportion of transportation emissions in the city's baseline inventory, it should be noted that statewide actions addressing transportation emissions account for nearly 40% of total emissions estimated in this CAP. Many of the transportation measures included here support higher quality-of-life indicators, such as walkable communities, improved local air quality, and reduced traffic congestion.

T-1: Pedestrians + Bicycles

Measure T-1.1: Pedestrian Environment Enhancements

Supporting Measure – Not Quantified

Continue to plan for safe, attractive pedestrian environments that encourage walking between nearby destinations.



Measure Background

Pedestrian enhancements encourage walking, potentially increasing foot traffic to local retail establishments and businesses, while decreasing automobile trips and emissions. Pedestrian enhancements include the provision of seating, shading, way-finding signs, safe crosswalks, and traffic calming measures. Providing connectivity and convenient, enjoyable pedestrian areas also improves residents’ quality of life.

Recent efforts by the city to increase walking and safety through new pedestrian infrastructure includes the construction of a pedestrian underpass beneath the Union Pacific Railroad tracks; installation of pedestrian islands, roundabouts, and other traffic calming measures; and improved traffic light signalization. These types of improvements act to slow drivers and increase their awareness of non-motorized roadway users, increasing safety for pedestrians and cyclists.

Moving forward, the city will continue to work with STA on updates to the Countywide Pedestrian Master Plan, including the prioritization of projects to be implemented within Dixon. The Countywide Plan provides a framework for local governments to identify important improvements that would increase pedestrian safety in their cities and throughout Solano County. The Countywide Plan was developed so that it could be adopted by individual cities to serve as their local Pedestrian Master Plan, thereby fulfilling a common criterion of pedestrian-improvement grant funding programs. Dixon will either adopt the Countywide Plan or develop its own Pedestrian Master Plan. The city should also identify funding sources to help install priority projects, particularly for instances when a local match is required to qualify for grant funds.

Action	Responsibility
A Develop Pedestrian Master Plan or adopt Solano Countywide Pedestrian Plan to serve as guidance for pedestrian improvements; update plan every 3-5 years	Engineering
B Prioritize implementation of pedestrian enhancements as identified in Pedestrian Master Plan	Engineering
C Identify funding sources to provide city's match for project planning, design, and construction	Engineering
D Implement city's complete streets policy requiring accommodations for non-automotive circulation on newly constructed roads and during major roadway improvement projects	Engineering

Measure T-1.2: Bicycle Infrastructure

Supporting Measure – Not Quantified

Continue to install bicycle paths and lanes within the community to increase bicycle ridership and safety.



Measure Background

The city updated its Bikeways Plan in 2005 to improve the local bicycle infrastructure and encourage cycling for local trips and recreation. The Bikeways Plan aims to enable safe bicycle travel as an everyday means of transportation within the city to promote active lifestyles and reduce air pollution.

Recent implementation efforts include the construction of the West B Street railroad underpass to replace the existing at-grade pedestrian/bicycle railroad crossing located between N Street and N. Jefferson Street. The construction of a grade-separated underpass will allow pedestrians and cyclists to safely cross the Union Pacific Railroad (UPRR) tracks to access other parts of the city or the proposed Intermodal Transit Facility.

As new development occurs within Dixon, the city will continue to include bicycle infrastructure accommodations as part of the Development Agreement process. The city will also continue to partner with STA to pursue opportunities for additional bicycle safety improvements, particularly those related to UPRR crossings.

Action	Responsibility
A Implement city's adopted 2005 Bikeways Plan; update plan every 3-5 years	Engineering; Community Development;
B Prioritize bikeways improvements as shown on Bikeways Plan map, balancing considerations for immediate safety concerns and long-term returns on strategic improvements	Engineering
C Identify funding sources to provide city's match for project planning, design, and construction	Engineering
D Identify and work to remove barriers that could inhibit cyclists from accessing various transit stations / stops	Engineering; Community Development

Measure T-1.3: Bicycle Outreach Program

Supporting Measure – Not Quantified

Develop a bicycle outreach program to promote communitywide "bikeability" through safety programs, bicycle tune-up clinics/training, and partnerships with bicycle advocacy groups and cycling clubs.



Measure Background

Bicycle education and outreach are important to increasing bicycle safety and ridership within the community. These programs can increase community members' comfort with cycling for exercise or running daily errands, with instruction on proper bicycle maintenance, safe cycling techniques, and an introduction to local cycling groups. STA currently provides a successful countywide Safe Routes to School program, which includes bicycle rodeos for elementary school students and a Walk N' Roll week to teach safety in walking and cycling.

The city will continue to partner with STA on implementation of the Safe Routes to School program, including efforts to evaluate efficacy of the program to determine if modifications should be made in the future. The city will also support STA in implementation of the Countywide Wayfinding Signage Program Phase II. Regional bicycle trail directional signs were installed in Phase I of this regional program. Phase II will include installation of local wayfinding signs to help riders find points of interest, such as Downtown Dixon, city parks, and the proposed Intermodal Facility. The city can also work with local cycling clubs or advocacy groups to identify dangerous conditions that should be addressed in future updates of the Bikeways Plan.

Action	Responsibility
A Work with STA to continue its bicycle safety education activities, including bicycle rodeos and Walk-and-Roll programs at local schools	STA; Engineering;
B Solicit comments from local cycling clubs/advocacy groups to identify dangerous cycling conditions within city; address problem areas through Safe Routes to School (SRTS) Program	Engineering
C Support STA in effort to evaluate efficacy of existing SRTS program to identify changes in pedestrian or bicycle accidents and modify future program as necessary	STA; Engineering
D Support STA in adoption and implementation of Countywide Wayfinding Signage Program Phase II	STA; Engineering

T-2: Public Transit

Measure T-2.1: Transit Route Stabilization

Supporting Measure – Not Quantified

Ensure maintenance of existing transit service programs before attempting to expand services.



Measure Background

Successful public transit systems shift commute trips from personal automobiles to buses, shuttles, trains, and other options. Well-designed public transit systems serve a community's major residential, employment, and cultural centers at service intervals that allow riders to easily and predictably plan trips. Viable transit systems are dependent upon a sufficient ridership base, which often requires an average minimum population or employment density around transit stops.

The diffuse, lower-density nature of Dixon's development makes the creation of a robust public transit system difficult. Rather than attempt to expand the geographic extent of the current transit system, the city will first work with STA to ensure existing levels of service continue into the future. The city will work with STA to implement its Short-Range Transit Plan, which includes near-term strategies to stabilize the existing transit system. The city will also continue to explore opportunities through the public planning process to increase densities and intensities within certain areas of the city. Measure T-3.1 and T-3.2 address land use strategies that could help to strengthen the existing transit system, and in the long-term, provide a sufficient ridership base to allow for system expansion.

Action	Responsibility
A Work with STA to implement findings of Short-Range Transit Plan to keep current transit systems viable	STA; Recreation & Community Services
B Facilitate higher density development within designated Downtown Revitalization Plan area to increase potential ridership of residents and employees along existing transit routes	Community Development
C Enhance local transit service next to high density, mixed-use development areas to take advantage of proximity to new potential transit riders	STA; Recreation & Community Services; Community Development

T-3: Land Use

Measure T-3.1: Transit-Oriented Development

Supporting Measure – Not Quantified

Create opportunities for new higher-density, mixed-use development adjacent to transit centers or major stops.



Measure Background

Transit-oriented development (TOD) places higher density and intensity development within walking distance of primary transit stops. This strategy brings residents and jobs closer to transit opportunities, providing additional ridership for the public transit system. Successful TOD can take various shapes, depending on the character of the community. TOD can focus on increasing employment near transit stops, typically within a ½-mile radius, provided adequate pedestrian connectivity is available for riders to then reach their jobs. It can also focus on increasing residential densities near transit stops, usually within a ¼-mile radius. TOD can also include a mix of uses (e.g., residential, office, retail) when the goal is to develop a more complete neighborhood center.

Community opposition to increased densities or intensities may hinder local efforts to encourage TOD. Local land use and development policies may also pose a barrier. Parking standards that ignore the potential for reduced automobile trips in TOD may inhibit development due to the high cost of providing parking.

The city will conduct a study of parking availability in Downtown Dixon as well as the potential future parking demand based on existing land use designations. This study will help to determine if future development could be allowed parking reductions or exemptions without negatively affecting the neighborhood. The city will also identify potential areas for increased development density and/or intensity, and verify that adequate infrastructure exists to support that level of development.

Action	Responsibility
A Conduct Downtown parking survey to determine if existing parking is adequate in quantity and location for future increased development densities/intensities	Community Development;
B Pending conclusions determined per Action A, reduce Downtown off-street parking requirements for transit-oriented and mixed-use developments, for developments providing shared parking, and for developments that incorporate travel demand management measures	Community Development
C Identify areas that could support net increase in population or employment through land use changes within 1/4 mile walking distance of transit stops	Community Development

D	Work with Public Works Department to evaluate capacity for higher-density/intensity development in future transit areas, and develop prioritization and funding strategies to complete necessary improvements	Public Works; Community Development;
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Measure T-3.2: Mixed-Use Development

Supporting Measure – Not Quantified

Encourage mixed-use development through land use and zoning designations to support alternative transportation options for certain daily activities.



Measure Background

The distribution of land uses and the degree of street connectivity within a city influences how people travel. Land use strategies that place daily needs near each other and near residential neighborhoods allows some trips to be made without a car. Development patterns that provide convenient pedestrian connectivity to parks, schools, retail, and jobs also supports non-automotive transportation options. Mixed-use development often creates these pedestrian-friendly environments with a variety of uses nearby that allow people to address some or all of their daily live, work, play and shop needs in one place.

Single use zoning, as the name implies, only allows one type of land use within an area, which can result in large areas dominated by a single development type, such as single-family houses or shopping. This type of development makes use of alternative transportation options difficult because densities are often too low to support public transit and the distances between different land uses are too great to encourage walking or cycling.

In conjunction with the transit-oriented development measure described above, the city will work with Dixon residents to identify opportunities for future mixed-use development through land use and zoning changes. The same parking analysis described in Measure T-3.1 can be used to determine if parking requirements for mixed-use development can be reduced based on shared parking opportunities that result from mixing land uses.

	Action	Responsibility
A	Identify opportunities to increase mixed-use development around transit centers, primary transit stops, and/or within Downtown Revitalization Plan area	Community Development
B	Conduct Downtown parking survey to determine if existing parking is adequate in quantity and location for future increased development densities/intensities [Same as T-3.1 Action A]	Community Development

C	Pending conclusions determined per Action A, reduce Downtown off-street parking requirements for transit-oriented and mixed-use developments, for developments providing shared parking, and for developments that incorporate travel demand management measures [Same as T-3.1 Action B]	Community Development
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T-4: Alternative Fuels

Measure T-4.1: Alternative Fuel Vehicles

2020 GHG Reduction Potential: **553 MT CO₂e/yr**

2035 GHG Reduction Potential: See *Progress towards 2035*

Target discussion at end of chapter

Encourage communitywide use of alternative fuel vehicles through expansion of alternative vehicle refueling infrastructure.



Measure Background

Alternative-fueled vehicles use electricity, compressed natural gas (CNG), liquefied petroleum gas (LPG), hydrogen fuel cells, or other fuel types that have lower carbon content than traditional gasoline and diesel fuel. As engine technologies continue to advance, alternative-fueled vehicles have become increasingly popular to reduce fuel costs and emissions.

One of the primary challenges to increased adoption of alternative-fueled vehicles has been limited refueling infrastructure available to support the various vehicle types. Often referred to as “range anxiety”, an incomplete network of refueling infrastructure limits broad adoption of these vehicles as drivers feel confined to the limits of their known refueling locations. Local governments can play a role in combatting range anxiety by exploring cost-effective opportunities to install recharging infrastructure for electric vehicles, requiring pre-wiring for electric charging stations in new developments and parking lots, and working regionally to construct expensive infrastructure, such as CNG and LPG refueling stations.

The city will look for cost-effective opportunities to install electric vehicle charging stations in publicly accessible areas of the community, through grant funded opportunities or donations from technology providers. The city will also require pre-wiring for at-home electric vehicle charging stations in new development (that is not already permitted with an existing Development Agreement), and will work with STA to develop requirements for the installation of EV charging units in new parking lots. The city will continue to support STA’s efforts to develop a regional CNG refueling station that could be used to refuel municipal fleet vehicles, and support efforts to make this charging station available for public use, if possible.

Action	Responsibility
A Continue to explore cost-effective ways to increase alternative vehicle charging / refueling infrastructure within the city	Engineering; Community Development; Sustainability Coordinator
B Work with STA to develop informational brochures and technical support for developers / contractors installing electric vehicle charging ports in new projects; post information on city's website	STA; Building Division; Sustainability Coordinator
C Require pre-wiring for at-home electric vehicle charging ports in future new single family and multi-family construction (i.e., those not currently permitted); update city's building code to reflect these changes	Building Division
D Require installation of public-use EV charging units in parking lots of new non-residential construction; work with STA to define thresholds with regards to ratio of charging units to total parking spaces required and minimum project size to trigger mandatory compliance	STA; Building Division; Community Development;

Progress Indicators	Year
5% of gasoline passenger cars switch to plug-in hybrid electric (PHEV); 5% of gasoline light-duty trucks switch to PHEV; 5% of diesel passenger cars switch to PHEV; 5% of diesel light-duty trucks switch to PHEV	2020

Measure T-4.2: Municipal Alternative Fuel Vehicles

Supporting Measure – Not Quantified

Shift municipal vehicle fleet from gasoline- and diesel-powered vehicles to alternative-fueled vehicles, to the extent possible.



Measure Background

Compressed natural gas (CNG), hybrid vehicles, and plug-in electric vehicles are increasingly being incorporated into municipal fleets nationwide to help reduce vehicle-related emissions, lower operating costs, and show sustainability leadership at the local government level.

Many municipal fleet vehicles could be replaced with cleaner versions capable of performing the same tasks upon regular vehicle replacement. Passenger vehicles and light-duty trucks can often be replaced with battery electric vehicles or plug-in hybrid electrics. Some diesel-powered heavy-duty vehicles and equipment can be replaced with CNG or LPG vehicles, if refueling infrastructure is available. Recent diesel and natural gas prices have made this type of replacement feasible from an economic standpoint as well.

In an effort to modernize the city’s municipal fleet, the city will support efforts to develop a regional alternative fuel vehicle procurement program to leverage economic benefits of bulk purchases. The city will also partner with STA in its efforts to develop a regional CNG refueling station for use by municipal fleets. Development of this facility could support future conversion of Dixon’s Ready-Ride fleet to CNG vehicles.

Action	Responsibility
A Consider purchasing alternative fueled vehicles and/or more fuel-efficient vehicles during routine vehicle replacement	Public Works; Building Division
B Support STA in its efforts to develop a CNG refueling station for public and private use within Solano County	STA; Public Works
C Pursue grant funding or vendor’s promotional offers to install EV charging stations at city facilities for use by municipal vehicles	Public Works; Sustainability Coordinator
D Consider partnering with other Solano County governments in regional alternative fueled vehicle procurement program to achieve lower vehicle costs through bulk procurement	Public Works; Sustainability Coordinator

T-5: Transportation Demand Management

Measure T-5.1: Demand Management Program

2020 GHG Reduction Potential: **110 MT CO₂e/yr**

2035 GHG Reduction Potential: **177 MT CO₂e/yr**

Provide informational resources to local businesses subject to SB 1339 transportation demand management program requirements and encourage voluntary participation in the program.



Measure Background

Transportation demand management (TDM) programs are a collection of policies and incentives that reduce travel congestion at peak commute hours. Common TDM practices include subsidized or pre-tax transit passes, flexible work hours, emergency rides home, vanpool or carpool incentives, and parking cash-out programs that pay employees who agree to give up their guaranteed parking spaces.

SB 1339 authorizes the Bay Area Air Quality Management District (BAAQMD) and Metropolitan Transportation Commission (MTC) to adopt and implement a regional ordinance known as the Bay Area Commuter Benefits Program. The program requires employers with 50 or more employees within MTC’s jurisdiction to select one of four commuter benefit options (e.g. transit or vanpool subsidy). Although the City of Dixon is

not within the BAAQMD boundaries, the city is within MTC’s boundaries and therefore, subject to the requirements of SB 1339.

The city will support STA, which is largely responsible for implementation of the TDM program, in its efforts to comply with program requirements. STA already has a well-established rideshare network and incentivizes the creation of new vanpools, which are seen as the likeliest path towards compliance for Solano County jurisdictions.

BAAQMD has made funding available to help its members comply with the legislation. However, Dixon is within the Yolo Solano Air Quality Management District (YSAQMD), which has not yet provided funding to its members to help with compliance. Dixon will work with STA and YSAQMD to identify potential funding opportunities that will achieve the goals of SB 1339. The city will also work with STA on an outreach campaign directed at local businesses of fewer than 50 employees, to attract voluntary participation in the TDM program.

Action	Responsibility
A Support STA's efforts to implement SB 1339 TDM program requirements	STA; Sustainability Coordinator
B Work with STA on outreach campaign targeting employers with 50 or fewer employees to encourage voluntary participation in TDM program activities, including pre-tax deductions for transit expenses, new vanpool creation, and Solano Commute Challenge	STA; Sustainability Coordinator
C Work with other Solano County cities within YSAQMD to identify funding source to help implement TDM program	STA; YSAQMD

Progress Indicators	Year
800 employees voluntarily participate in rideshare program or telecommuting/alternative work schedule	2020
1,200 employees voluntarily participate in rideshare program or telecommuting/alternative work schedule	2035

Measure T-5.2: Intelligent Transportation

Supporting Measure – Not Quantified

Improve traffic signal coordination on major local roadways to reduce congestion during peak travel times.



Measure Background

Building an efficient transportation system can improve traffic flow and reduce congestion-related transportation emissions. Intelligent transportation systems (ITS)

incorporate traffic signal synchronization on major roadways to reduce instances of “stop-and-go” traffic and vehicle idling.

As future growth areas within the city are developed and traffic levels increase, the city will consider opportunities to pursue ITS on local roadways or at connection points with Interstate-80, in coordination with CalTrans.

Action	Responsibility
A Explore opportunities to implement ITS projects as city's new growth areas develop and traffic increases on local streets	Engineering

Water Strategy

Water-related GHG emissions primarily come from the energy used to pump, transport, and treat potable water and wastewater. Water-related emissions accounted for approximately 3% of the communitywide GHG inventory.

With water supplies expected to continue declining into the future, water conservation strategies have the added benefits of aligning demand with future water availability, improving public health, and saving ratepayers money.

Senate Bill (SB) X7-7 (2009) requires the state to achieve a 20% reduction in urban per capita water use by December 31, 2020. The state is required to make incremental progress toward this goal by reducing per capita water use by at least 10% on or before December 31, 2015. SB X7-7 requires each urban retail water supplier to develop both long-term urban water use targets and an interim urban water use target. This law also creates a framework for future planning and actions for urban and agricultural users to reduce per capita water consumption 20% by 2020.

The GHG emissions reduction potential from implementing SB X7-7 locally is 394 MT CO₂e/yr in 2020, which represents 1.5% of total emissions. While the level of emissions reductions attributed to this measure is relatively small, the long-term water conservation benefits it provides are highly valuable to an agricultural community such as Solano County.

W-1: Urban Water Management Plan

Measure W-1.1: SB-X7-7

2020 GHG Reduction Potential: **394 MT CO₂e/yr**

2035 GHG Reduction Potential: **474 MT CO₂e/yr**

Support water districts' in their implementation of water conservation policies contained within Urban Water Management Plans.



Measure Background

Dixon residents and businesses receive water service from the California Water Service Company and the Dixon-Solano Water Authority (DSWA). The California Water Service Company is the urban water provider to central Dixon, and adopted its most recent Urban Water Management Plan (UWMP) in 2011. DSWA provides water to the remainder of the city, including the currently undeveloped areas in the northern and southern parts of the city. Due to the size and character of DSWA, it is not required to prepare an UWMP under the Urban Water Management Planning Act.

As part of its UWMP, the California Water Service Company demonstrates its current and future abilities to provide water within its service boundaries. Additionally, SB X7-7 requires that urban water providers adopt conservation targets and implementation plans that will achieve a 20% per capita water use reduction by 2020. The California Water Service Company incorporated its water conservation targets and plan into its current UWMP. In general, the plan identifies best management practices (BMPs) in water conservation, including:

- + residential water surveys and retrofits,
- + system and large landscape water audits and leak detection,
- + metering and conservation pricing,
- + public information and educational programs,
- + energy efficient appliance and high-efficiency toilet rebate programs, and
- + water waste prevention measures.

This CAP assumes that the California Water Service Company will implement the BMPs identified within its UWMP, and will achieve its 2020 water conservation targets.

Action	Responsibility
A Support water districts in their implementation of water conservation policies contained within Urban Water Management Plans to comply with requirements of SB X7-7	California Water Service; Sustainability Coordinator

Progress Indicators	Year
20% reduction in per capita water use by 2020 over baseline established in UWMPs	2020 and 2035

Solid Waste Strategy

Waste disposal creates emissions when organic waste (e.g., food scraps, yard clippings, paper and wood products) is buried in landfills and anaerobic digestion takes place, emitting methane. Additionally, the extraction and processing of raw materials for consumer products, distribution to consumers, and eventual disposal of the products, creates emissions as well. In Dixon, about 3% of GHG emissions are associated with solid waste generation and disposal in landfills.

The zero-waste concept in waste management is a high-level goal to increase communitywide solid waste diversion efforts above the 90% range. Implementation of the county's Integrated Waste Management Plan can help to shift waste generation patterns over time. Other opportunities to reduce waste and related emissions include programs to divert waste away from landfills, increase recycling rates, reuse waste byproducts (e.g. construction materials), and expand organic waste collection.

Recycling helps to remove organic materials, like recyclable paper and cardboard, from the waste stream where it would ultimately contribute to landfill methane emissions. One option to increase recycling is through the enhancement and promotion of commercial paper recycling campaigns, in an effort to divert a broader range of recyclable paper away from landfills. Additionally, measures can encourage coordination between local businesses, waste haulers, and the County Department of Resource Management to increase commercial waste diversion and identify reusable waste byproducts. Construction and demolition waste can also be diverted, in increasingly higher proportions, through recycling or material reuse.

Although a number of the solid waste measures presented below cannot be quantified at this time, the results of their implementation will still make meaningful contributions to statewide emissions reduction efforts. Their inclusion within this CAP also provides future opportunities for regional implementation efforts, should other local governments seek collaboration on any of these measures.

The total GHG emission reduction potential of the waste strategy is 136 MT CO₂e/yr in 2020. Solid waste reductions represent approximately 1% of total reductions in 2020.

SW-1: Waste Reduction

Measure SW-1.1: Landfill Diversion

Supporting Measure – Not Quantified

Maximize waste diversion communitywide through preparation of a solid waste strategic plan.



Measure Background

The purpose of a solid waste strategic plan is to establish a framework that allows a community to achieve long-term waste reduction goals. Implementation of such a plan would be a comprehensive effort including expanded recycling programs, green waste and organics collection, source reduction, and byproduct re-use from area industries. Assembly Bill 939 requires local jurisdictions to meet numerical diversion goals. Although landfill capacity is no longer considered the statewide crisis it once was, solid waste diversion programs protect public health and safety and extend the operable life of the area’s landfills.

The Solano County Department of Resource Management works with local jurisdictions to prepare the *Countywide Integrated Waste Management Plan (CIWMP)* and its periodic updates. Dixon will continue to work with the county on implementation of the CIWMP, and will establish a non-binding goal to exceed the 50% communitywide solid waste diversion requirements in AB 939. Longer-term strategies like this, while not intended to be implemented immediately, will help the city to make progress on its future emissions reduction goals. The city can also leverage its existing relationship with Recology Dixon to identify local opportunities for additional waste reductions.

Action	Responsibility
A Continue to work with the County Department of Resource Management to update and implement the Countywide Integrated Waste Management Plan (CIWMP)	Public Works; Sustainability Coordinator
B Establish non-binding goal and implementing strategy to exceed 50% communitywide solid waste diversion requirements established by AB 939, either through updates to CIWMP elements or through preparation of standalone strategic plan	Public Works; Sustainability Coordinator
C Work with franchise waste haulers to identify additional opportunities for solid waste diversion	Public Works

Measure SW-1.2: Commercial Recycling Program

Supporting Measure – Not Quantified

Increase commercial paper recycling rates through implementation of AB 341 and targeted outreach campaigns.



Measure Background

Commercial establishments typically generate white paper, mixed office paper, newspaper, and corrugated cardboard. Approximately 90% of all office waste is paper. According to the US EPA, commercial establishments also generate a large portion of the estimated 24.1 million tons of corrugated cardboard discarded each year. Enhanced office paper recycling will help reduce emissions associated with organic landfill waste, and help to conserve raw materials.

Assembly Bill 341 (2011) requires development of commercial and multi-family residential recycling programs statewide. AB 341 also sets a 75% statewide recycling goal for 2020 (as compared to the 50% solid waste diversion requirements embodied in AB 939). As the city’s contract waste hauler, Recology Dixon has already reached out to commercial and multi-family property owners within the city to begin recycling service. Recology Dixon also provides assistance with commercial waste audits, employee training and education, and provides support to local businesses in selecting the appropriate recycling program for their needs.

The regional sustainability coordinator will work with area franchise waste haulers to develop informational materials to help increase office paper recycling. These materials should highlight the broad range of office paper products that can be recycled.

Action	Responsibility
A Support franchise haulers, as necessary, in their outreach efforts to increase recycling rates among commercial and multi-family residential customers, as specified in AB 341	Public Works; Sustainability Coordinator
B Work with County Department of Resource Management and franchise waste haulers to develop enhanced paper recycling outreach campaign directed at office managers that explains full range of recyclable paper products that can be diverted from solid waste stream	Public Works; Sustainability Coordinator

Measure SW-1.3: Source Reduction Program

Supporting Measure – Not Quantified

Identify opportunities for creative reuse of industrial waste material.



Measure Background

Source reduction programs are strategies to reduce the volume of waste generated by certain activities or processes, and are designed to eliminate waste before it is created. These programs typically influence the design, manufacturing, and packaging of goods and materials to decrease both resource inputs and waste outputs. These programs can also be applied at the broader community level to address certain waste-generating activities. The promotion of reusable shopping bags is a common source reduction program intended to minimize solid waste disposal and pollution associated with plastic bag use.

At the individual business scale, source reduction programs can result in operational costs savings related to solid waste disposal or even become a revenue generator. For example, the Campbell Soup Company's waste recycling programs focus on recycling food waste, corrugated paper, steel drums, office paper, plastic, fluorescent tubes, batteries, wood pallets and scrap metal. In addition, Campbell's Asset Recovery program recycled or reused almost 1.2 million pounds of used equipment in 2012, generating nearly \$700,000 in sales revenue.^{xii}

Certain businesses may also find that the waste materials produced from their operations can be used as the input material for another business. This type of symbiotic relationship could result in operating costs savings for both businesses, if these industry connections can be identified. Solano County's agricultural sector could be an excellent candidate if beneficial reuse opportunities can be found for its organic waste stream. The Solano Center for Business Innovation has organized round table discussions with Allied Waste, one of the franchise waste haulers operating within the county, to identify opportunities for waste reuse at a local industrial park. This type of discussion could be expanded to include other waste haulers, large waste generators, and business leaders to identify interconnection among the county's industries and businesses. Results from these discussions could help inform a targeted economic development campaign. If a beneficial waste product is found to be in abundance, businesses that use such a product as an input material could be enticed to co-locate closer to the resource. The city will partner with the Solano Center for Business Innovation, franchise waste haulers, and local industries to identify potential byproduct reuse.

Action

A Work with Solano Center for Business Innovation, region's franchise waste haulers, and local industries to identify opportunities to reuse waste byproducts from one manufacturing process as input materials for another

Responsibility

Sustainability Coordinator;
Solano Center for Business
Innovation

SW-2: Organic Waste

Measure SW-2.1: Residential Food Scrap and Compostable Paper Diversion

2020 GHG Reduction Potential: **7 MT CO₂e/yr**

2035 GHG Reduction Potential: **227 MT CO₂e/yr**

Encourage participation in collection of food scraps in green waste bins through public outreach campaigns.



Measure Background

According to CalRecycle, food scraps comprised nearly 16% of the state’s total waste stream, including more than 25% of the residential waste stream.^{xiii} Food scraps are unwanted cooking preparation and table scraps, such as banana peels, apple cores, vegetable trimmings, bones, egg shells, meat, and pizza crusts. Compostable paper, sometimes called food-soiled paper, usually comes from the kitchen and is not appropriate for paper recycling due to contamination. Materials such as stained pizza boxes, uncoated paper cups and plates, used coffee filters, paper food cartons, napkins, and paper towels are all compostable paper. Diverting these organic items from the landfill helps to reduce methane gas generation from anaerobic decomposition, and helps to extend the operable life of a landfill.

While Dixon’s current waste hauling contract with Recology Dixon allows for collection of fruits, vegetables, and bread products in green waste bins, there is limited participation data available to determine what percentage of household food waste is successfully being diverted. To encourage additional participation in this type of collection, the city will partner with the Solano County Resource Management Department and Recology Dixon on public outreach campaigns, including local elementary school programs explaining what foods can be composted and why it is important. The city will also discuss opportunities with their franchise waste hauler to expand the existing food scrap collection program (i.e., types of food scraps accepted) and include compostable paper in the city’s green waste bins.

Action	Responsibility
A Partner with Solano County Resource Management Department and franchise waste haulers on public outreach campaign promoting food scrap collection in green waste bins	Public Works; Sustainability Coordinator
B Provide information to local elementary schools on existing food scrap diversion program for incorporation into on-going recycling curriculum	Public Works; Sustainability Coordinator

C	Meet with franchise waste hauler to discuss contract amendment to include compostable paper (e.g., soiled paper plates, napkins, paper towels) collection service through green waste bins	City Manager's Office
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Progress Indicators	Year
25% of Dixon households divert 20% of their food scraps through green waste bins or on-site composting	2020
50% of Dixon households divert 75% of their food scraps and compostable paper through green waste bins or on-site composting	2035

Measure SW-2.2: Commercial Food Scrap Collection

2020 GHG Reduction Potential: **13 MT CO₂e/yr**
 2035 GHG Reduction Potential: **122 MT CO₂e/yr**

Develop a voluntary commercial food scrap collection pilot program that targets restaurants, hotels, and other food vendors.



Measure Background

According to CalRecycle, food scraps comprised nearly 16% of the state's total waste stream, including more than 15% of the total commercial waste stream.^{xiv} Commercial food scrap generators include facilities with industrial kitchens, such as hotels, restaurants, schools and universities, and conference centers, as well as food distributors, such as grocery stores. Other commercial land uses, like offices and retailers, typically generate much lower volumes of food scraps than these other uses.

Some cities have implemented commercial food scrap collection pilot programs to help divert organic materials from the solid waste stream. These programs typically work to remove logistical barriers associated with food scrap collection, including space limitations for additional collection bins, odor and pest control related to collection frequency, and employee training and/or customer education on how the programs work. The city will first research best practices in similarly sized communities, and then work with local business organizations and franchise waste haulers on development of a voluntary food scrap collection program for the city.

Action	Responsibility
A Work with franchise waste haulers, the Dixon Chamber of Commerce, the Downtown Dixon Business Association, and other local business organizations to develop and encourage participation in a voluntary commercial food scrap collection program	Public Works; Sustainability Coordinator
B Identify opportunities to share best-practices and lessons learned with other cities in Solano County that have implemented similar programs	Sustainability Coordinator

Progress Indicators	Year
20% of Dixon's commercial businesses divert 50% of their food scraps from solid waste stream	2020
40% of Dixon's commercial businesses divert 75% of their food scraps and compostable paper from solid waste stream	2035

Measure SW-2.3: Yard Waste Diversion

2020 GHG Reduction Potential: **49 MT CO₂e/yr**

2035 GHG Reduction Potential: **154 MT CO₂e/yr**

Encourage participation in yard waste diversion through public outreach campaign.



Measure Background

Yard waste includes leaves, grass clippings, and downed branches, and can easily be composted through either backyard composting or yard waste collection programs. Yard waste diversion helps avoid methane generation at landfills, extends a landfill's operable lifetime, and provides opportunities for beneficial reuse of this nutrient-rich organic material.

Dixon residents receive a green waste bin from the city's franchise waste hauler for home yard waste collection. The city's website also provides a link to the Solano County Recycle guide, which provides information on yard waste disposal and composting. Participation rates are typically very high throughout the state for residential green waste collection since the programs are easy to understand and the collection bins are often provided as part of the regular solid waste collection service. To enhance participation in the compostable food collection program described in Measure SW-2.1, the city will partner with the Solano County Resource Management Department and franchise waste haulers to promote the disposal of yard waste and food scraps in green waste bins.

Action	Responsibility
A Partner with Solano County Resource Management Department and franchise waste haulers on public outreach campaign to promote use of green waste bins for yard waste collection instead of trash bins; campaign should be combined with food scrap diversion efforts	Public Works; Sustainability Coordinator

Progress Indicators	Year
90% of residential units divert 95% of their yard waste through green waste bins or on-site composting; 90% of non-residential properties divert 95% of their yard waste through green waste bins or on-site composting;	2020
90% of residential units divert 95% of their yard waste through green waste bins or on-site composting; 90% of non-residential properties divert 95% of their yard waste through green waste bins or on-site composting;	2035

Measure SW-2.4: Construction and Demolition Waste

2020 GHG Reduction Potential: **67 MT CO₂e/yr**

2035 GHG Reduction Potential: **318 MT CO₂e/yr**

Enforce construction and demolition waste diversion requirements in State's Green Building Code.



Measure Background

According to CalRecycle's 2008 Statewide Waste Characterization Study, construction and demolition (C&D) materials account for approximately 29 percent of the waste stream in California, including scrap lumber which comprises nearly 15% of the statewide total.^{xv} Scrap lumber is an organic material, and therefore generates methane emissions through anaerobic decomposition in a landfill. It is also a highly reusable material, which helps conserve virgin natural resources. Many other construction materials can also be diverted from the waste stream for reuse or recycling, including concrete and asphalt, bricks, scrap metal, and drywall.

The California Green Building Code currently requires 50% diversion of C&D materials for all new residential and commercial projects, with few exceptions. CalRecycle provides a list of best practices and other resources on its website to help cities and contractors comply with this requirement, and the city's website also has a link to the Solano County Recycle Guide with information on C&D material recycling and reuse opportunities in Dixon. As green building practices become more common in the region, waste haulers and contractors will improve their abilities to divert higher percentages of C&D waste in support of project documentation requirements for various green building certification programs (e.g., LEED, Green Point Rated).

Implementation and monitoring challenges limit full participation in the state's C&D diversion efforts, even though the requirements are codified in the Green Building Code. Some communities, such as Fairfield, have adopted formal ordinances establishing diversion thresholds. Others have gone a step further to develop a C&D diversion deposit program, in which the project applicant pays a deposit (as a percentage of total project costs or on a square foot basis) in exchange for a building permit. The deposit is reimbursed to the applicant upon submittal of appropriate documentation showing what level of diversion was achieved by the contractor or waste hauler. The program

could also be structured to forgo deposit requirements if applicants provide a signed contract with an authorized C&D collector that clearly states the level of diversion to be achieved.

The city will adopt a C&D diversion ordinance, using the CalRecycle website as a reference for sample ordinance language. The city will consider increasing its diversion requirements to 75% of scrap lumber or 75% of total C&D waste as part of future CAP updates, provided that local C&D collectors and area landfills can achieve higher diversion rates. The city will also consider development of a C&D diversion deposit program to ensure compliance with this requirement.

Action	Responsibility
A Adopt construction and demolition (C+D) waste diversion ordinance that requires 50% diversion from qualifying projects; sample ordinance language is provided on CalRecycle website	Building Division
B Consider increasing diversion requirements to 75% diversion by 2020; alternatively, only target scrap lumber with 75% diversion requirement	Building Division
C Consider developing Construction and Demolition Debris Diversion Deposit Program to help enforce C+D ordinance, in which deposit is paid to city prior to issuance of building permit and refunded to applicant following submittal / approval of applicable waste diversion documentation; alternatively, an applicant could provide a signed contract with an authorized C&D collector in lieu of a deposit	Building Division; Sustainability Coordinator

Progress Indicators	Year
50% of C&D waste is diverted from 90% of applicable new construction/renovation projects	2020
75% of C&D waste is diverted from 90% of applicable new construction/renovation projects	2035

Green Infrastructure Strategy

Green infrastructure refers to the natural features of a community that also provide an often unnoticed community benefit. In Dixon, green infrastructure includes the urban forest, parks, landscaped medians and parkways, and other natural landscapes. These areas can reduce the urban heat island effect, perform stormwater management, and improve air quality and public health.

As one component of the green infrastructure network, urban forests provide shade and can reduce the heat island effect, which causes temperatures to increase in areas with concentrations of exposed pavement and rooftops. These higher temperatures can lead to increased air conditioner use, which increases energy consumption and can strain utility infrastructure at peak hours of the day. Urban forests also provide a visual amenity for residents and habitat value for wildlife.

The city also recognizes other beneficial aspects of trees. Trees beautify neighborhoods, increase property values, reduce noise and air pollution, and create privacy. Additionally, trees gain carbon-sequestering biomass in their trunks and roots as they absorb carbon dioxide from the air to grow. The measure in this section seeks to enhance Dixon's already well-established urban forest.

The total GHG emission reduction potential of the Green Infrastructure Strategy is 219 MT CO₂e/yr in 2020. This represents about 1% percent of total 2020 reductions anticipated from CAP implementation.

GI 1: Green Infrastructure

Measure GI-1.1: Urban Forest Program

2020 GHG Reduction Potential: **219 MT CO₂e/yr**

2035 GHG Reduction Potential: **333 MT CO₂e/yr**

Support natural carbon sequestration opportunities through development and maintenance of a healthy, vibrant urban forest using outreach, incentives, and strategic leadership.



Measure Background

Dixon's urban forest comprises trees planted on both public and private lands. Currently, parking lots with more than 30 spaces are required to plant trees or install shade structures such that 40% of the parking lot will be shaded. The Northeast Quadrant Specific Plan includes requirements for 50% shading of new parking lots. The city also requires street trees to be planted at 1-2 trees per 50 feet of street frontage

(depending on land use designation) through its Municipal Code. To support these requirements, the city's Street Tree Ordinance contains a list of recommended trees for planting as well as species that are unsuitable for use as street trees. In addition to these required tree plantings, private property owners often choose to incorporate trees into their landscaping. Collectively, these trees represent the city's urban forest, and provide air quality benefits, shading, wildlife habitat, natural stormwater management benefits, visual character, and long-term carbon sequestration.

In 2013, the city received grant funding to plant a total of 70 trees in Northwest Park, Veterans Park, and at Pond C. The grant covered 75% of the cost for trees and associated planting materials, with the city providing a local match to cover the remainder of the project. The city will continue to look for grant opportunities to help fund tree planting or related activities. However, because a majority of the urban forest resides on private property, the city also needs community support in managing this valuable asset.

The city will enforce existing tree-planting requirements for new construction and parking lots, including the new shade tree ordinance described in Measure E-5.1. The city will also identify neighborhood groups and/or urban forestry organizations that can be engaged to help promote a healthy urban forest. These organizations could assist in tree planting campaigns designed to increase the voluntary planting of shade trees or landscape trees. They could also play a role in nurturing new street trees through an adopt-a-tree program to reduce the burden on the Public Works Department. The city could also consider developing a tree protection ordinance requiring the replacement of removed street trees. The city could provide guidance on planting site selection to ensure that tree replacements are appropriately planted to minimize potential root damage to driveways, sidewalks, and underground utilities.

Action	Responsibility
A Enforce existing tree-planting requirements for new construction and parking lots, including new shade tree ordinance described in CAP energy measures	Community Development
B Identify opportunities to partner with urban forest organizations or similar groups to encourage voluntary tree planting and proper maintenance	Community Development; Sustainability Coordinator
C Advertise shade-tree-giveaway programs or other incentives, when available	Community Development; Sustainability Coordinator
D Consider developing tree protection ordinance that requires replacement of removed street trees	Community Development

Progress Indicators	Year
1,775 new trees planted in the community	2020
2,700 new trees planted in the community	2035

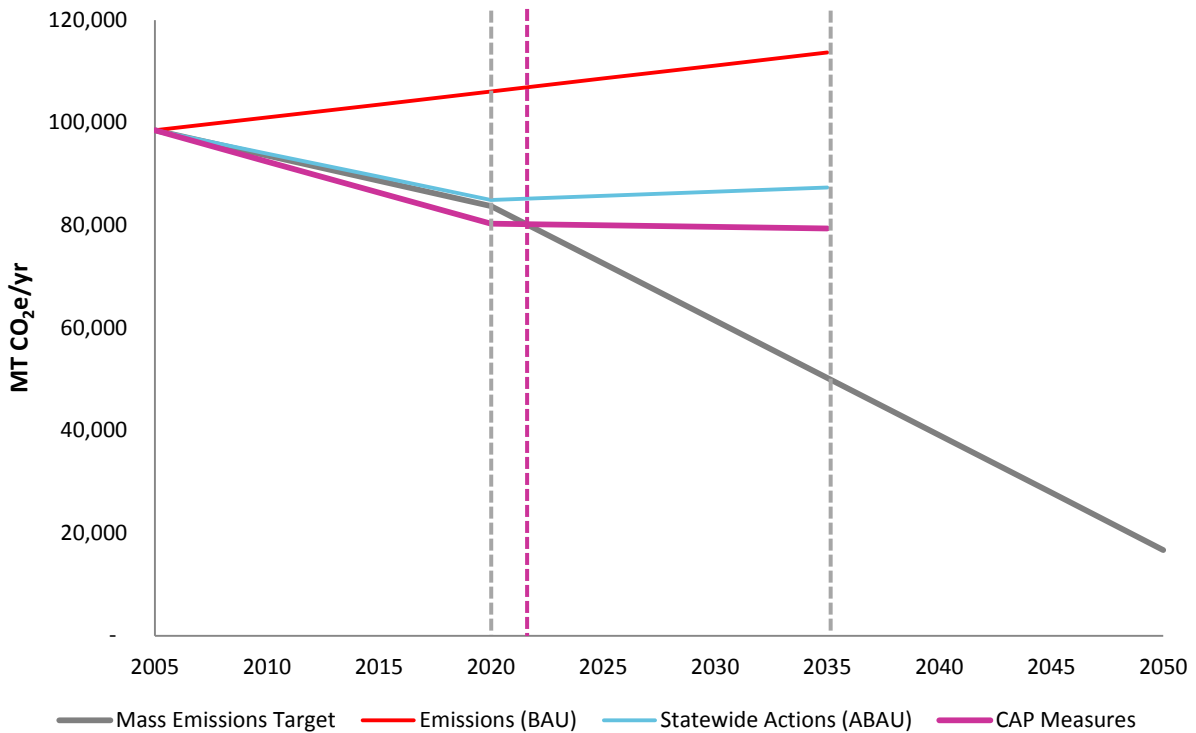
Target Achievement

PROGRESS TOWARD 2020 TARGET

The measures described above, combined with the State actions described in Chapter 2, have the potential to reduce communitywide emissions by 25,730 MT CO₂e/yr from projected 2020 levels. This progress **exceeds** the city's 2020 reduction target of 15% below 2005 levels, representing an 18.4% reduction in baseline emissions.

Figure 3.2 shows the additive impact of statewide actions and local actions that achieve the city's 2020 target. Business-as-usual emissions forecast through 2035 are shown in red. The impact of known and quantifiable statewide actions is shown in blue, with the local actions of this CAP's measures shown in fuchsia. The vertical dashed gray lines mark the 2020 and 2035 horizon years. As shown, the combination of statewide and local actions reduces the city's emissions below the solid gray target line in 2020, indicating target achievement. The vertical dashed fuchsia line marks where the city's emissions are estimated to increase above the long-term target trajectory line; this occurs in approximately 2022. Beyond that date, statewide actions and these CAP measures no longer keep up with projected emissions growth.

Figure 3.2 – 2020 Target Achievement



PROGRESS TOWARD 2035 TARGET

As shown in Figure 3.2, the city will not achieve a 2035 target with the identified statewide and local measures alone. Emissions reductions totaling 63,440 MT CO₂e/yr would be required to achieve the 2035 target (i.e., 49% below 2005 levels). However, this CAP estimates future reductions of only 34,282 MT CO₂e/yr in 2035, or 19.4% below baseline.

Several variables will influence the city's ability to achieve future longer-term targets. First, statewide actions, which provide the majority of reductions in this CAP, are shown to flat-line beyond the 2020 horizon year. This is due to the fact that the Scoping Plan has only quantified the impacts of statewide actions through 2020. While the 2008 Scoping Plan has been revised, the new and revised actions included therein have not yet been quantified, so local governments are not yet able to take credit for the local share of those actions. It is likely that the state will continue to develop actions and programs that will support achievement of its 2050 statewide reduction target. However, at this time the potential future impact of those actions is unknown.

Second, new technologies that support additional emissions reduction may be developed between now and 2035. Existing technologies may also become more effective or financially viable for increased implementation. One example is the cost and ubiquity of solar photovoltaic panels, which have experienced exponential market growth during the last few decades. Increased renewable energy development could be a large source of future emissions reductions.

Third, additional local CAP measures may be developed during future plan updates, or CAP measures may be implemented at higher rates than previously estimated. The 2035 reduction estimates are based on the best available data and assumptions, but the future is difficult to predict accurately. Regular emissions inventory updates will be the best predictor of future target achievement, and will help the city to identify emissions sectors that need additional attention.

Fourth, and final, future target achievement is based on numerous growth estimates, which may or may not be accurate in reality. If the city grows faster than anticipated in the emissions inventories, it will become harder to achieve long-term targets without deeper implementation of CAP measures. However, if the city grows more slowly, so too will its emissions, potentially making future targets easier to achieve.

LONG-TERM REDUCTION OPPORTUNITIES

As part of the CAP development process, the participating cities considered several measure options that would provide long-term reduction opportunities, but would also require regional collaboration for successful implementation. These additional measures could be applied to the estimated statewide and local actions included in this CAP to demonstrate a pathway towards future target achievement. However, these options were not developed with the same level of detail as the local CAP measures included in this chapter, and are provided here for informational purposes only. Rough estimates of future emissions reduction potential were calculated using readily-available data and studies. Additional analysis would be required to ensure their feasibility for local implementation.

These measures were included here so that conversations with regional partners and local residents can begin early, with the hope that some or all of the measures are ready to begin implementation by 2020.

PG&E Green Option

2035 Reduction Potential (Municipal): 263 MT CO₂e/yr

PG&E is in the process of finalizing its proposed Green Option Program, which would allow customers to voluntarily purchase 100% renewable electricity. The California Public Utilities Commission (CPUC) will respond to PG&E's proposed program by July 1, 2014. If approved, PG&E expects the program to be available for subscription within a few months following approval. The program is currently expected to be capped at 125 MW of demand and for a five-year pilot program. It is currently unknown how participation will be granted should the program become fully-subscribed.

The city could consider participating in this program so that 100% of municipal electricity is generated from renewable sources. Though municipal emissions only represent a fraction of total communitywide emissions, this program provides an opportunity to demonstrate regional leadership in emissions reductions. Residents and local businesses will also be able to voluntarily participate in this program. A similar program offered by the Sacramento Municipal Utility District currently has an approximately 10% voluntary participation rate.

City Actions to Consider

- + Review participation costs with regards to municipal electricity expenses when final program information is available
- + Evaluate benefits to city's participation

Community Choice Aggregation

2035 Reduction Potential (75% participation): 11,212 MT CO₂e/yr

This option is included above as a stand-alone measure to highlight its importance for long-term target achievement. As described in Measure E-7.5, community choice aggregation allows a city or cities to supply electricity to customers within their borders through the establishment of a CCA. Solano County included a measure in their CAP to explore development of a CCA in partnership with the county's cities. CCA's are typically designed as an opt-out program, which means that all residents and businesses within its boundaries are automatically enrolled in its service with the ability to opt out and remain with PG&E as their utility provider. This type of enrollment is one reason that CCA programs enjoy high participation rates. For example, Marin Clean Energy began serving customers in May 2010, and currently procures electricity for 75% of electric customers in Marin County.

The city could consider participating in regional conversations regarding opportunities and challenges to establishing a Solano County CCA.

City Actions to Consider

- + Collaborate with regional partners to evaluate feasibility for CCA development (e.g., start-up costs, funding sources, legal considerations, participation estimates)

Alternative Fuel Vehicles

2035 Reduction Potential: 6,250 MT CO₂e/yr

Advancements in alternative fuel vehicle technologies make long-term market adoption seem likely. As described in Measure T-4.1 above, there are actions the city can take to facilitate this market transition, including pre-wiring requirements in new construction for electric vehicle charging stations, pursuit of grant funding to install public charging infrastructure, and collaboration with STA and local cities on development of a CNG refueling station. The reduction potential shown above is dependent upon decreasing vehicle costs resulting from further technological advancement and increasing market adoption that brings to bear economies of scale in automotive manufacturing. This estimate includes a transition away from gasoline and diesel vehicles to plug-in hybrid electric vehicles, battery-electric vehicles, and compressed natural gas vehicles throughout the range of vehicle class categories (e.g., passenger cars, light duty trucks, buses).

As the use of electric vehicles increases, it will become more important to clean the electricity grid in order to maximize the emissions reductions associated with alternative fuel vehicles.

City Actions to Consider

- + Research best-practices in facilitating market shift towards alternative fuel vehicles through local policies
- + Participate in regional collaboration on CNG refueling station
- + Explore opportunities to convert Ready-Ride vehicles to alternative fuel vehicles

Advanced Methane Capture

2035 Reduction Potential (95% capture): 2,592 MT CO₂e/yr

The city could explore opportunities with their franchise waste hauler to send the community's solid waste to a landfill facility with a highly-efficient methane control system. These advanced systems can capture 90-95% of fugitive methane emissions, significantly reducing solid waste emissions. A variety of factors should be considered before pursuing this option. The city should work with their franchise waste hauler to identify nearby landfills that have advanced methane capture systems and capacity to accept new customers. The cost premium of shipping to such a facility should also be considered, particularly as compared to the amount of emissions that could potentially be reduced. Further analysis may indicate that this option is either technically or financially infeasible.

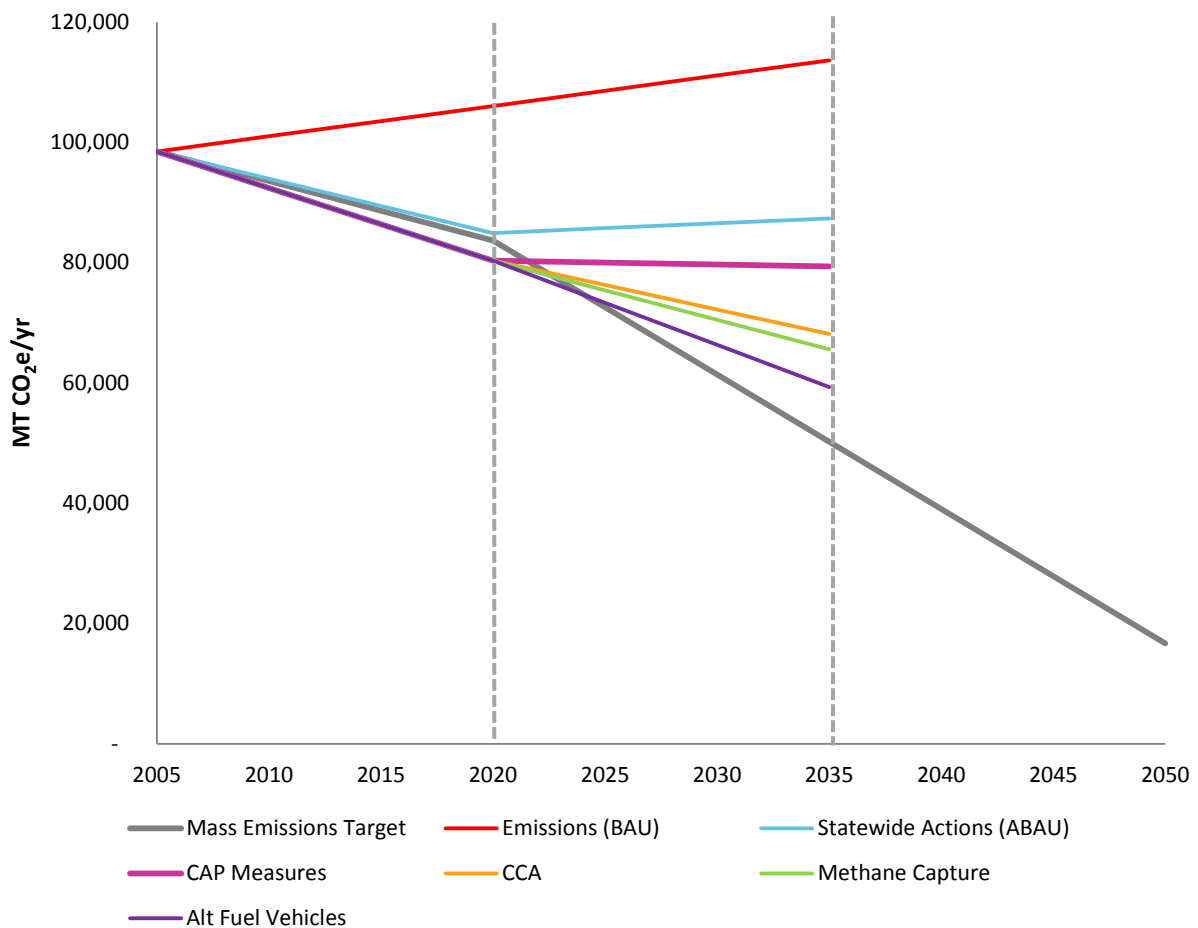
City Actions to Consider

- + Identify area landfills with advanced methane capture systems
- + Discuss potential costs with franchise waste haulers
- + Further analyze emissions reduction potential; compare to future emissions reduction gap and potential costs

Figure 3.3 shows that development and implementation of these measures (excluding the PG&E Green Option to avoid double-counting with the CCA program) would nearly achieve the 2035 target. Combined with the reduction estimates in Table 3.1, these measures would bring total reductions to 54,336 MT CO₂e/yr in 2035, which is 39.8% below 2005 levels. Though a gap of 9,104 MT CO₂e/yr still exists, the target could yet be achieved based on the earlier description of unknown variables influencing longer-range reduction targets.

At the very least, Figure 3.3 provides a framework to demonstrate what it will take to mirror the state’s aggressive long-range targets at the local level. The largest reduction opportunities known at this time are likely to come from cleaner electricity sources and a large-scale shift towards alternative-fuel vehicles.

Figure 3.3 – Long-Term Reduction Options



Notes

ⁱ US Census, 2010.

ⁱⁱ PG&E, 2012. Available at:
http://www.pgecorp.com/sustainability/en03_clean_energy.jsp.

ⁱⁱⁱ US Census, 2010.

^{iv} US Census, 2010.

^v California Energy Commission. *2009 California Residential Appliance Saturation Study*. Prepared by KEMA, October 2010.

^{vi} *ibid.*

^{vii} National Renewable Energy Laboratory Renewable Resource Data Center, 2011.

^{viii} PG&E. *PG&E Generation Interconnection Services Progress Report for Dixon*. October 2012.

^{ix} California Energy Commission. *Solar Water Heating CEC 2013 Title 24 Pre-rulemaking Workshop*. June 9, 2011.

^x PG&E, October 2012.

^{xi} PG&E. *Case Study: Fairfield Suisun Sewer District Integrated Energy Management*. August 2009.

^{xii} Campbell's Soup, 2012. Available at:
http://csr.campbellsoupcompany.com/csr/pages/resources/reports-and-data.asp#UxTKgvidV_4.

^{xiii} California Integrated Waste Management Board. *California 2008 Statewide Waste Characterization Study*. Prepared by Cascadia Consulting Group, August 2009. Available at: <http://www.calrecycle.ca.gov/Publications/Documents/General/2009023.pdf>.

^{xiv} *Ibid.*

^{xv} *Ibid.*

CHAPTER 4

BENCHMARKS + IMPLEMENTATION

4

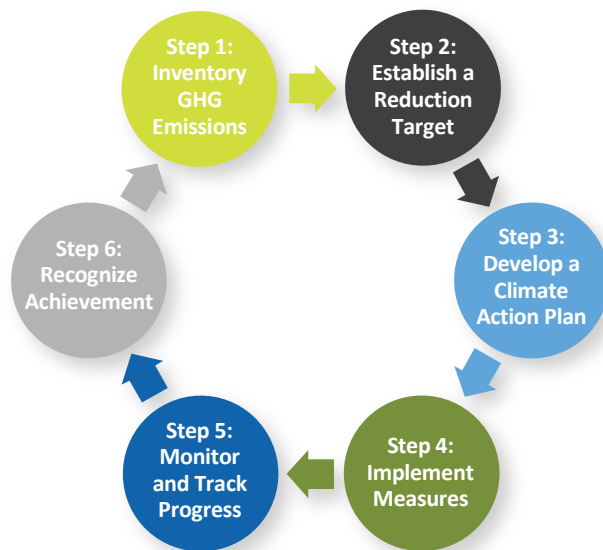
This chapter describes how city staff will implement CAP measures and related actions, and track the performance metrics identified for each measure as part of the larger Regional CAP Program. The chapter also discusses the need to evaluate, update, and amend the CAP over time, so the plan remains effective and current. Using the CAP to evaluate future project consistency is presented with regards to mandatory and voluntary nature of the CAP's measures. Lastly, the chapter gives an overview of potential funding sources to support CAP implementation. While funding sources are continually evolving, this section presents types and sources of funding that are currently, or known to be regularly, available in order to help focus the city's effort.

Implementation and Monitoring

Ensuring that the CAP measures translate from policy language into on-the-ground results is critical to the success of the plan. To facilitate this, each measure described in Chapter 3 contains a table that identifies specific actions which the city will carry out, and the departments responsible for each action. Each table also provides performance metrics to enable city staff, the City Council, and the public to track measure implementation and monitor overall CAP progress. The tables provide both interim (2020) and final (2035) performance metrics. Interim performance metrics are especially important, as they provide checkpoints to evaluate if a measure is on the right path to achieving its GHG reductions.

Figure 4.1 was presented in Chapter 1 to describe the first three steps in the CAP development process. This chapter describes strategies to approach Steps 4 and 5, which cover the implementation and monitoring process.

Figure 4.1 – Steps in the CAP Development Process



PERFORMANCE METRICS

The performance metrics are directly related to the estimated GHG emissions reductions. Therefore, they are written to provide a quantifiable measurement to accurately track progress toward the reduction target. For example, Measure E-7.1 encourages voluntary installation of rooftop solar photovoltaic systems. The measure’s estimated GHG emissions reductions are based on numerous assumptions, including the number of residential and commercial buildings that will install solar photovoltaics between 2005 and the 2020 and 2035 target years (including those that have already installed systems since 2005). The performance metric assumes that 525 single-family residential buildings will include a 4.5 kW solar PV system by 2020 (in addition to those

already existing in the 2005 baseline year). This measure also assumes that 3.7 MW of new solar photovoltaic capacity will be installed on multi-family and commercial buildings by 2020. If there is greater adoption of solar photovoltaics than estimated in this measure, then additional emissions reductions will occur. Likewise, if installations fall short of the estimates described here, then this measure will achieve less than its stated reductions. Participation rate assumptions are described in Appendix C.

STAFFING AND COORDINATION

Upon adoption of the CAP, the city departments identified for each measure in Chapter 3 will become responsible for implementing assigned actions. Key staff in each department will facilitate and oversee this work, working in tandem with the proposed regional Sustainability Coordinator. To assess the status of city efforts, CAP plan implementation meetings should take place several times a year. Some actions will require inter-departmental or inter-agency cooperation, and appropriate partnerships will need to be established.

REGIONAL CLIMATE ACTION PLANNING PROGRAM COORDINATION

This CAP was developed in tandem with three other Solano County cities as part of a Regional Climate Action Planning Program. To ensure an approach that is mutually beneficial and efficient, measures and actions were developed with regional relevance. Table 4.1 provides a summary of the measures identified in Chapter 3 as candidates for regional implementation. These measures have the potential to save city resources and effort when coordinated and implemented regionally. Appendix E presents the full list of regional implementation opportunities that were considered, including a comparison to the adopted CAPs of Solano County and the Cities of Benicia and Vallejo.

The primary option for developing and managing a successful regional strategy is to establish the role of Sustainability Coordinator (see Measure CC-1.1 in Chapter 3) to facilitate this process, either at the city-level or as a regional position housed within a county agency. This person would have the ability to work with the participating cities on implementation of regional measures, as well as coordinate with Solano County and city staff from Benicia, Vallejo, and Vacaville on countywide programs. Additional funding would be needed to support development of regionally applicable outreach campaigns and shared resources, such as a Solano County Sustainability Website (see Measure CC-1.2 in Chapter 3).

**Table 4.1
Regional Implementation Measures**

CROSS-CUTTING STRATEGY		CITIES¹	RESPONSIBILITY
CC-1.1	Sustainability Coordinator	All	Community Development; Solano EDC
CC-1.2	Public Outreach	All	Community Development; Sustainability Coordinator
ENERGY STRATEGY		CITIES	RESPONSIBILITY
E-1. Existing Buildings			
E-1.1	Energy Efficiency Retrofit Outreach	All	Sustainability Coordinator; Community Development; Building Division
E-1.2	Energy Efficiency Audits	All	Solano Center for Business Innovation; Sustainability Coordinator; Community Development
E-3. Financing			
E-3.1	Energy Efficiency Rebate Program	All	Sustainability Coordinator; Community Development
E-3.2	PACE Financing Program	All	Solano Center for Business Innovation; Building Division
E-4. Building Appliances			
E-4.1	ENERGY STAR Appliances	All	Sustainability Coordinator; Community Development; Building Division
E-4.2	Smart Grid	All	Building Division; Sustainability Coordinator
E-6. Building Lighting			
E-6.1	Building Lighting Efficiency	All	Building Division; Sustainability Coordinator
E-7. Renewable Energy			
E-7.4	District Energy Systems	Dixon, Fairfield, Suisun City	Solano EDC; Sustainability Coordinator; Community Development; Building Division; Public Works
E-7.5	Community Choice Aggregation	All	Sustainability Coordinator
E-8. Street and Area Lighting			
E-8.1	Street Light Upgrade	Dixon, Rio Vista, Suisun City	Public Works
E-9. Municipal Actions			
E-9.1	Municipal Renewable Energy Development	Dixon, Fairfield, Rio Vista	Solano EDC; Sustainability Coordinator; Community Development; Public Works
TRANSPORTATION + LAND USE STRATEGY		CITIES	RESPONSIBILITY
T-1. Pedestrians + Bicycles			
T-1.3	Bicycle Outreach Program	All	STA; Public Works
T-4. Alternative Fuels			
T-4.2	Municipal Alternative Fuel Vehicles	All	STA; Public Works; Building Division; Sustainability Coordinator

SOLID WASTE STRATEGY		CITIES	RESPONSIBILITY
SW-1. Waste Reduction			
SW-1.3	Source Reduction Program	All	Sustainability Coordinator; Solano Center for Business Innovation
SW-2. Organic Waste Diversion			
SW-2.1	Residential Food Scrap and Compostable Paper Diversion	All	Sustainability Coordinator; City Manager's Office
SW-2.2	Commercial Food Scrap Collection	All	Sustainability Coordinator
SW-2.3	Yard Waste Diversion	All	Sustainability Coordinator
GREEN INFRASTRUCTURE STRATEGY		CITIES	RESPONSIBILITY
GI-1. Green Infrastructure			
GI-1.1	Urban Forest Program	All	Sustainability Coordinator; Community Development

Note:

¹ The designation of All Cities includes Dixon, Fairfield, Rio Vista, and Suisun City

Program Evaluation and Evolution

The CAP represents the city's initial attempt to create an organized, communitywide plan to reduce GHG emissions. City staff will need to evaluate the plan's performance over time, and be ready to alter or amend the plan in the future if it is not on track to achieve its reduction targets.

PROGRAM EVALUATION

Two types of performance evaluation are important:

- (1) Evaluation of the community's overall ability to reduce GHG emissions, and
- (2) Evaluation of the performance of individual CAP measures.

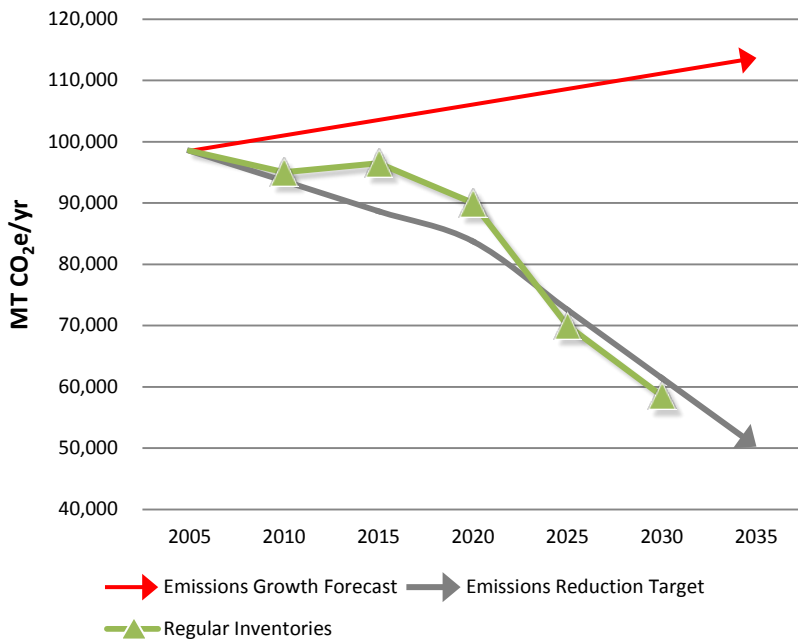
GHG Inventory Updates

Regular communitywide GHG emission inventories will provide the best indication of CAP effectiveness. It will be important to reconcile actual growth in the city versus the growth projected when the CAP was developed. Conducting these inventories periodically will enable direct comparison to the 2005 baseline inventory and will demonstrate the CAP's ability to achieve the adopted reduction target.

The Community Development Department, in conjunction with the proposed Sustainability Coordinator, will prepare communitywide inventories every three to five years following adoption of the CAP to assess progress toward the GHG emissions reduction targets. Figure 4.1 gives an example of how regular communitywide inventories can help track progress toward the reduction targets compared to the business-as-usual emissions forecasts. In the hypothetical scenario shown,

communitywide emissions actually increase through 2015 before they start declining to achieve the long-term reduction target. This type of communitywide overview is the easiest way to determine if the CAP measures are being effectively implemented.

Figure 4.2 – Example of Future Emissions Inventory Monitoring



Source: AECOM 2014

CAP Measure Effectiveness

While communitywide inventories provide information about overall emission reductions, it will also be important to understand the effectiveness of each measure. Evaluation of the emissions reduction capacity of individual measures will improve staff and decision makers’ ability to manage and implement the CAP. The city can reinforce successful measures and reevaluate or replace under-performing ones. Evaluating measure performance will require data regarding actual community participation.

Applying the Measure Tracking Template

Table 4.2 provides an example of a measure tracking template that could be used to monitor the efficacy of each CAP measure. The table is similar to the measure tables included in Chapter 3, but has been expanded to include phasing and tracking mechanisms. The phasing column allows each responsible department or agency to identify internal timelines for implementing specific action steps. These could be expressed as specific target years or more generally as short-, medium-, and long-term actions. The tracking mechanisms specify how implementation of the progress indicators will be monitored. Similar to the future communitywide inventories, the progress indicators should be evaluated regularly to ensure each measure is on track to achieve its stated emissions reductions. If during the implementation review process a measure is found to be falling short of its performance targets, then additional attention can be given to modifying the implementation strategy. If implementation review

indicates that a measure will be unable to achieve its stated reduction level, then additional CAP measures could be developed to make up the difference or other measures could be enhanced to increase their reduction potential. For this reason, CAP implementation should be an iterative process to reflect future changes in the city.

Monitoring Statewide Actions

Similar to the local measures described in this CAP, program evaluation should also include monitoring statewide actions addressing climate change; particularly those actions for which an emissions reduction was calculated and counted in the city's progress toward its reduction targets (see Table 2.4 in Chapter 2). The city should work with the Sustainability Coordinator to track implementation of statewide actions to ensure that estimated reductions actually occur. New statewide actions may also be established in the future that will result in additional local emissions reductions. These new actions should be incorporated into a future CAP revision, and would further reduce the burden on implementing local actions.

Reporting Schedule

The proposed Sustainability Coordinator and responsible departments and agencies will evaluate measure performance on the same schedule as the communitywide inventories following adoption of the CAP, and summarize progress toward the GHG reduction target in a report that describes estimated annual GHG reductions in 2020, achievement of performance metrics, participation rates (where applicable), and remaining barriers to implementation.

The proposed Sustainability Coordinator (or delegated city staff) will report progress on the CAP action items to decision-makers on an annual basis. Staff will deliver this report in conjunction with the state-required annual report to the City Council regarding implementation of the city's General Plan. The progress report will include a cursory assessment of progress and implementation of individual CAP measures, including how new development projects have incorporated relevant measures. The progress report will also identify measure gaps and recommend corrections.

Table 4.2
Measure Implementation Tracking Template

MEASURE E-7.1 SOLAR PHOTOVOLTAIC SYSTEMS

Facilitate the voluntary installation of solar PV systems on residential and nonresidential buildings.

Action	Responsibility	Phasing
A Review/revise all applicable building, zoning, and other codes and ordinances to identify and remove potential regulatory barriers to the installation of solar PV or solar hot water systems in residential and nonresidential construction.	Building Division	Establish an internal target date or timeframe for implementing each action. (e.g., Short-Term, Medium-Term, Long-Term, or specific target years)
B Provide priority permitting for building-scale renewable energy projects.	Building Division; Sustainability Coordinator	
C Reduce solar PV permitting fees.	Building Division; Sustainability Coordinator	
D Develop a comprehensive outreach campaign to increase voluntary participation in solar PV installation programs, including a directory of existing rebates/incentive programs, explanation of simple-payback calculations for solar PV systems, and technical assistance. Leverage existing solar PV informational materials from Energy Upgrade California, the California Solar Initiative, and PG&E.	Building Division; Sustainability Coordinator	
E Develop informational materials about the benefits of PPAs offered through independent solar service providers. Post on the Solano County Sustainability Website, and make printed copies available at the Planning Department and Building Division counters.	Building Division; Sustainability Coordinator	

Progress Indicators	Year	Tracking Mechanisms
525 single-family units install 4.5kW PV system 3.7 MW capacity installed on nonresidential and multi-family buildings	2020	Collect information from building permit data and analyze to gauge progress towards indicator targets: <ul style="list-style-type: none"> • How many single family homes installed PV systems in each year, and at what total new capacity? • What was the total new installed PV capacity for multi-family and nonresidential buildings in each year? • What was the total new combined installed PV capacity in each year?
725 single-family units install 4.5kW PV system 8.5 MW capacity installed on nonresidential and multi-family buildings	2035	

PROGRAM EVOLUTION

To remain relevant, the city must be prepared to adapt and transform the CAP over time. It is likely that new information about climate change science and risk will emerge, new GHG reduction technologies and innovative municipal strategies will be developed, new financing will be available, and state and federal legislation will change. It is also possible that future inventories will indicate that the community is not achieving its adopted target. As part of the evaluations identified above, the city will assess the implications of new scientific findings and technology, explore new opportunities for GHG reduction, respond to changes in climate policy, and incorporate these changes in future updates to the CAP to ensure an effective and efficient program.

Project Consistency with CAP

The CAP identifies both mandatory and voluntary GHG reduction measures that would apply to different types of future projects.

MANDATORY MEASURES

For each of the following mandatory measures, the CAP either reinforces the implementation of current codes, ordinances, and state legislation, or directs changes to the city's codes and ordinances that would result in GHG reductions. All new projects would be required to comply with these codes and ordinances, as applicable:

- + Measure E-1.3: Commercial Energy Conservation Ordinance
- + Measure E-2.2: Solar Ready Construction
- + Measure E-5.1: Building Shade Trees
- + Measure E-7.3: Residential Renewable Energy Requirements
- + Measure T-1.1: Pedestrian Environment Enhancements
- + Measure T-4.1: Alternative Fuel Vehicles
- + Measure T-5.1: Demand Management Program
- + Measure W-1.1: SB-X7-7
- + Measure SW-1.2: Commercial Recycling Program
- + Measure SW-2.4: Construction and Demolition Waste
- + Measure GI-1.1: Urban Green Forest Program

VOLUNTARY MEASURES

The remaining measures are essentially voluntary, relying on assumed levels of community participation to create communitywide GHG reductions. These measures will be tracked to ensure participation rates are reached and that the voluntary measures are being adequately applied to new and existing projects. If voluntary implementation is found to fall short of the CAP's reduction targets, then additional, more aggressive actions may be necessary to correct shortfalls.

Funding Sources and Financing Mechanisms

This section describes potential funding sources and financing mechanisms that Dixon could pursue to offset the financial burden of implementing the CAP measures described in Chapter 3. Each measure is accompanied by an analysis of costs and savings, and potential funding sources, financing strategies, and partnership opportunities.

The spectrum of public and private funding options for the measures outlined in this CAP is ever evolving. This section outlines viable funding options that are current, but

could eventually become out of date. However, there are general sources of funding that provide the most up-to-date information, including:

- + U. S. Department of Energy (DOE)
- + Environmental Protection Agency (EPA)
- + US Department of Housing and Urban Development (HUD)
- + California Energy Commission (CEC)
- + California Infrastructure and Economic Development Bank
- + Metropolitan Transportation Commission (MTC)
- + Association of Bay Area Governments (ABAG)
- + Pacific Gas & Electric (PG&E)
- + Yolo Solano Air Quality Management District (YSAQMD)

COSTS + SAVINGS

The city is not the only entity bearing financial responsibility for implementing for CAP measures; there will be a private cost borne by residents and businesses for specific measures. In recognition of this, a costs and savings analysis was performed for each measure to evaluate the cost to the city, as well as potential costs and savings to residents or property owners. A summary of this analysis can be found in Chapter 3, with analytical background information provided in Appendix B. Generally, the implementation costs to the city for the creation of programs, which consist primarily of initial start-up costs and ongoing administration/enforcement costs, range considerably from negligible additional costs to on the order of several hundred thousand dollars.

Measures vary in the distribution of costs. Some measures require only funding from the city or other public entities, whereas others require that residents and businesses contribute. In nearly all measures that require some investment by residents or business owners, there are substantial long-term savings that will allow recuperation of initial investments, as well as other benefits such as improved air quality or publicly-owned spaces such as streetscapes, open spaces, rights-of-way, etc. There are also measures that require no private investment, but generate savings for the resident or business owner.

FUNDING STRATEGY

The CAP will require strategic public funding by the city, regional government agencies, and the state government for capital projects, incentives, outreach/education, and new regulations necessary to achieve the plan's objectives. To decrease costs and improve the plan's efficiency, actions should be pursued concurrently whenever possible. For example, the city should pursue land use and transportation-related actions together during upcoming General Plan updates and in the development of Specific Plans. The city could also look to address water- and wastewater-related measures with the related utilities and agencies (e.g., water districts); inter-agency collaboration will be paramount to the success of the CAP.

Funding sources have not been identified for all actions; however, numerous federal, state, and regional grants are available to assist with funding. More details on these programs and others follow in the subsequent sections.

Additionally, Dixon should partner with nearby cities and jurisdictions to administer joint programs when feasible. As many businesses in Solano County and the Bay Area are leaders in resource efficiency, renewable energy, and green infrastructure, potential opportunities exist to partner with the private sector to decrease implementation costs. Finally, many of the measures and actions have the potential to be self-financing if properly designed and implemented.

FUNDING AND FINANCING SOURCES

Transportation-Related Incentives and Programs

Many state and regional grant programs are available to fund transportation and infrastructure improvements. The programs listed below represent the current status of the most relevant of these programs. It is, however, important to evaluate the status of a given program before seeking funding, as availability and application processes are updated periodically.

MTC Livable Communities & Housing Incentive Program

The purpose of MTC's Transportation for Livable Communities (TLC) Capital and Planning Program is to support community-based transportation projects that bring new vibrancy to downtown areas, commercial cores, neighborhoods, and transit corridors by enhancing their amenities and ambiance and making them places where people want to live, work, and visit. TLC provides funding for projects that are developed through an inclusive community planning effort, provide for a range of transportation choices, and support connectivity between transportation investments and land uses.

As part of the TLC program, the Housing Incentive Program (HIP) rewards local governments that build housing near transit stops. The key objectives of this program are to:

- + Increase the housing supply in areas of the region with existing infrastructure and services in place
- + Locate new housing where non-automotive transportation options are viable transportation choices
- + Establish the residential density and ridership markets necessary to support high-quality transit service

HIP funds are intended for transportation capital projects that support TLC goals, such as pedestrian and bicycle facilities that connect housing projects to adjacent land uses and transit; improved sidewalks and crosswalks linking housing to a nearby community facility, such as a school or public park; or streetscape improvements that support increased pedestrian, bicycle, and transit activities and safety.

MTC Transit-Oriented Development Policy

To promote cost-effective transit, ease regional housing shortages, create vibrant communities and preserve open space, MTC has adopted a Transit-Oriented Development (TOD) policy that will be applied to transit extension projects in the Bay Area. MTC's TOD policy includes three key elements:

- + Corridor-based performance measures to quantify minimum thresholds of development around transit stations, based on the transit mode; higher thresholds with more capital-intensive modes, such as BART.
- + Aid for funding Station Area Plans (SAPs) to promote a jobs and housing balance, station access, design standards, parking and other amenities based on unique circumstances, and community character.
- + Creation of corridor working groups to bring together local government staff, transit agencies, county congestion management agencies (CMAs) and other key stakeholders along the corridor to help develop station area plans to meet MTC's corridor-wide land-use thresholds.

As this policy is still in development, the city should keep track of its progress and applicability to the CAP.

YSAQMD Clean Air Funds

The state legislature has authorized YSAQMD to collect a \$4 surcharge on motor vehicle registration, to be used to fund clean air programs in the District' boundaries. In addition, YSAQMD receives funds from a special property tax (AB 8) generated from Solano County properties located within the Districts' boundaries. These programs are jointly referred to as YSAQMD Clean Air Funds. In the past, these funds have gone to projects such as:

- + Solano Napa Commuter Information (SNCI) ridesharing program,
- + electrical vehicle charging station installation,
- + signal light prioritization for transit vehicles near major transit hubs,
- + vehicle replacement,
- + public education and outreach, and
- + projects such as the Rio Vista Waterfront Promenade Phase 1.

YSAQMD and STA created a screening committee to make recommendations on projects in Solano County.

For 2014, the YSAQMD Clean Air Fund estimate is \$442,080. As with other fund sources, STA will evaluate all applications, but anticipates giving priority consideration to projects or programs that are contained in adopted STA countywide plans such as the Alternative Fuels, Bicycle, and Safe Routes to Schools plans.

ABAG / MTC FOCUS Program: Station Area and Priority Development Area Grants

<http://www.bayareavision.org/initiatives/prioritydevelopmentareas.html>

As outlined in MTC's Transit-Oriented Development Policy, future transit extensions in the Bay Area must be matched by supportive local land use plans and policies. To assist cities in meeting these goals, MTC launched a Station Area Planning grant program in 2005 to fund city-sponsored planning efforts for the areas around future stations and priority development areas identified by ABAG. These station-area and land-use plans are intended to address the range of transit-supportive features that are necessary to support high levels of transit ridership.

CALTRANS Planning Grants

Community Based Transportation Planning (CBTP) grants fund transportation and land use planning that promotes public engagement, livable communities, and a sustainable transportation system (e.g., mobility, access, and safety). The maximum award is \$300,000, and a local match of 20 percent of the grant request is required.

Safe Routes to Schools

Safe Routes to Schools is an international movement focused on increasing the number of children who walk or bicycle to school by funding projects that remove barriers to doing so. These barriers include lack of infrastructure, safety, and limited programs that promote walking and bicycling through education/ encouragement programs aimed at children, parents, and the community. In California, two separate Safe Routes to School programs are available: the State program referred to as SR2S, and the federal program referred to as SRTS; both fund qualifying infrastructure projects.

Energy-Related Incentives and Programs

Many of the financing and incentive programs relevant to the CAP concern energy infrastructure and conservation. Some of these programs are tied to the ARRA economic stimulus package enacted by Congress in February 2009, and may no longer be available. Access to these funds will be available for a limited period, and the city should seek the most up-to-date information regarding the programs listed below.

Energy Upgrade California

www.energyupgradecalifornia.com/

www.acgreenretrofit.org/

Energy Upgrade California is a program under the State Energy Program (SEP), which is administered by the CEC. The purpose of the Program is to create jobs and stimulate the economy through a comprehensive program to implement energy retrofits in existing residential buildings. The Program will focus on deploying re-trained construction workers and contractors, and youth entering the job market to improve the energy efficiency and comfort of California's existing housing, creating a sustainable energy workforce in the process.

The Association of Bay Area Governments (ABAG) administers this region-wide energy retrofit program for residential home energy retrofits. Across the Bay Area, this program is targeted to achieve energy efficiency upgrades in up to 15,000 single family and 2,000 multi-family residences.

The program is designed to:

- + Establish sets of verifiable retrofit standards for energy efficiency and other green improvements that are easy for building owners and contractors to understand
- + Train contractors to implement these standards in their retrofit projects
- + Create quality assurance procedures to help ensure that retrofit work meets program requirements and performance expectations
- + Offer financing for eligible improvements through California FIRST

- + Bundle potential rebates and other incentives to make them more accessible to property owners
- + Conduct a countywide marketing and public outreach campaign to get the word out to property owners and building industry contractors about best practices for energy efficiency and green retrofits, as well as financing and incentive opportunities.

Flex Your Power

www.fypower.org

Initiated in 2001, Flex Your Power is a partnership of California's utilities, residents, businesses, institutions, government agencies and nonprofit organizations working to save energy. The campaign includes a comprehensive website, an electronic newsletter and blog, and educational materials. The website provides regularly updated information on financial incentives and technical assistance for energy-efficient appliances, equipment, lighting and buildings. This information is available for residential, commercial, industrial and institutional consumers.

As existing programs evolve and new programs are created, Flex Your Power is a clearinghouse for information. Current incentives listed include:

- + The California Preschool Energy Efficiency Program (CPEEP) provides child care facilities with energy audits and retrofits.
- + The Enhanced Automation Initiative (EAI) pays large commercial and institutional customers to improve energy efficiency of existing building automation systems or energy management systems.
- + The School Energy Efficiency program (SEE) provides cash incentives for installing a variety of energy efficiency measures.
- + The Savings by Design program provides design assistance and financial incentives to commercial, industrial, institutional and agricultural building owners and design teams to promote energy efficient design and construction practices.

California Solar Initiative

www.gosolarcalifornia.org/csi/index.php

The California Solar Initiative (CSI) is the solar rebate program for California consumers who are customers of investor-owned utilities, such as PG&E. The CSI Program pays solar consumers an incentive based on system performance. For existing homes, existing or new commercial, agricultural, government, and non-profit buildings, this program funds both solar photovoltaics (PV), as well as other solar thermal generating technologies. Additionally, for homes and businesses, this program funds solar hot water systems. An additional rebate is available for single-family homes owned by low-income residents or multi-family affordable housing.

The CSI solar incentives differ by customer segment and size, and are intended to encourage high performing systems. There are two types of incentives available through the CSI program: Expected Performance-Based Buydown (EPBB) and Performance-Based Incentives (PBI). EPBB is a one time, up-front payment based on an estimate of the system's future performance. For solar projects with a system larger than 30 kW, PBI are monthly payments for 5 years based on actual performance (output) of the system. The

incentive rate is based on the incentive type—EPBB or PBI, and the relevant customer segment—residential, commercial or government/non-profit and current incentive step.

The CSI solar thermal hot water program will run for eight years, ending on December 31, 2017. To qualify of the CSI-Thermal rebate amounts differ by customers' system size, class (e.g., residential or commercial) and water heating fuel source (e.g., gas or electric).

California Feed-In Tariff

www.cpuc.ca.gov/PUC/energy/Renewables/hot/feedintariffs.htm

The California feed-in tariff allows eligible customer-generators to enter into 10-, 15- or 20-year standard contracts with their utilities to sell the electricity produced by small renewable energy systems -- up to 3 megawatts (MW) -- at time-differentiated market-based prices. Time-of-use adjustments will be applied by each utility and will reflect the increased value of the electricity to the utility during peak periods and its lesser value during off-peak periods. These tariffs are not available for facilities that have participated in the California Solar Initiative (CSI), Self-Generation Incentive Program (SGIP), Renewables Portfolio Standard, or other ratepayer funded generation incentive programs, including net-metering tariffs.

For customers generating renewable energy not covered by the CSI or SGIP (e.g., biomass or geothermal) the feed-in tariff is applicable. If customers prefer a long-term contract at a fixed price over a financial incentive paid in the short term, feed-in tariffs may be a beneficial financing tool.

California Energy Commission Energy Efficiency Financing

<http://www.energy.ca.gov/efficiency/financing/index.html>

The California Energy Commission offers low-interest loans for public institutions to finance energy-efficient projects. Interest rates are currently at 3%. Projects with proven energy and/or capacity savings are eligible, provided they meet the eligibility requirements. Examples of projects include:

- + Lighting systems
- + Pumps and motors
- + LED streetlights and traffic signals
- + Automated energy management systems/controls
- + Building insulation
- + Renewable energy generation and combined heat and power projects
- + Heating and air conditioning modifications
- + Waste water treatment equipment

Loans for energy projects must be repaid from energy cost savings within 15 years, including principal and interest (approximately 13 years simple payback for the one percent interest rate funding and approximately 11 years simple payback for the three percent interest rate funding). Simple payback is calculated by dividing the dollar amount of the loan by the anticipated annual energy cost savings.

Only project-related costs, with invoices dated after loans are officially awarded by the Energy Commission at a Business Meeting, are eligible to be reimbursed from loan

funds. The final ten percent of the funds will be retained until the project is completed. Interest is charged on the unpaid principal computed from the date of each disbursement. The repayment schedule is up to 15 years and will be based on the annual projected energy cost savings from the aggregated projects.

School Facility Program – Modernization Grants

www.opsc.dgs.ca.gov/Programs/SFProgams/Mod.htm

The School Facility Program (SFP) provides funding assistance to school districts for the modernization of school facilities. The assistance is in the form of grants approved by the State Allocation Board (SAB), and requires a 40 percent local contribution. A district is eligible for grants when students are housed in permanent buildings 25 years old or older and re-locatable classrooms 20 years old or older and the buildings have not been previously modernized with State funds. The modernization grant can be used to fund a large variety of work at an eligible school site including but not limited to air conditioning, insulation, roof replacement, as well as the purchase of new furniture and equipment.

Infrastructure State Revolving Fund Program

www.ibank.ca.gov/infrastructure_loans.htm

The Infrastructure State Revolving Fund Program provides direct low-cost loans for local governmental public infrastructure projects, including:

- + City Streets
- + City Highways
- + Environmental Mitigation Measures
- + Parks and Recreational Facilities
- + Public Transit
- + Solid Waste Collection and Disposal

Dixon can consider applying for these low-interest loans to implement a wide range of CAP measures. Though some eligible projects would be considered public projects, other eligible projects are pertinent to specific measures in this CAP. In particular, the transportation- and waste-related measures could seek financing through this program. Loans are available in amounts ranging from \$250,000 to \$10 million per applicant for Tier 1 loans, and \$250,000 to \$2.5 million per applicant for Tier 2 loans (the tier system is based on evaluation of project impact; the greater the project impact, the higher the cap on available funds).

CPUC Self Generation Incentive Program

www.cpuc.ca.gov/PUC/energy/DistGen/sgip/

The CPUC's Self-Generation Incentive Program (SGIP) provides incentives to support existing, new, and emerging distributed energy resources. The SGIP provides rebates for qualifying distributed energy systems installed on the customer's side of the utility meter. Qualifying technologies include wind turbines, fuel cells, and corresponding energy storage systems.

Energy-Related Bond Financing

Qualified Energy Conservation Bonds (QECBs)

A Qualified Energy Conservation Bond (QECB) is a tax credit bond; issuers repay principal on a regular schedule, but generally do not pay interest. Instead, the holder of a QECB receives a federal tax credit in lieu of interest, which may be applied against the bond holder's regular and alternative minimum tax liability. The tax credit amount is treated as taxable interest income to the holder of the bonds. For example, if the tax credit amount is \$100 and the holder is in the 35 percent tax bracket, the credit provides a \$65 benefit to the holder. Under the current program, QECBs must be issued by the end 2010, though this program is likely to be renewed for the foreseeable future.

The proceeds of the QECBs can be used for one or more of the following "qualified conservation purposes":

- + Type I: Capital expenditures incurred for purposes of (i) reducing energy consumption in publicly-owned buildings by at least 20 percent, (ii) implementing green community programs (including the use of loans, grants, or other repayment mechanisms to implement such programs), (iii) rural development involving the production of electricity from renewable energy resources, or (iv) any qualified facility eligible for the production tax credit under Section 45 of the IRS Code.
- + Type II: Expenditures with respect to research facilities and research grants to support research in: (i) development of cellulosic ethanol or other non-fossil fuels; (ii) technologies for the capture and sequestration of carbon dioxide produced through the use of fossil fuels, (iii) increasing the efficiency of existing technologies for producing non-fossil fuels; (iv) automobile battery technologies and other technologies to reduce fossil fuel consumption in transportation, or (v) technologies to reduce energy use in buildings
- + Type III: Mass commuting and related facilities that reduce the consumption of energy, including expenditures to reduce pollution from vehicles use
- + Type IV: Demonstration projects designed to promote the commercialization of (i) green building technology; (ii) conversion of agricultural waste for use in the production of fuel or otherwise; (iii) advanced battery manufacturing technologies; (iv) technologies to reduce peak use of electricity; or (v) technologies for the capture and sequestration of carbon dioxide emitted from combining fossil fuels to produce electricity
- + Type V: Public education campaigns to promote energy efficiency

Though some eligible projects would be considered public projects, other eligible projects are pertinent to specific measures in this CAP. In particular, the following eligible project types could have broad applicability in funding the measures in this CAP: Type II-(ii) green community programs, Type III mass commuting facilities, and Type V public education campaigns.

Other Climate-Related Programs

CAL FIRE Climate Change Program

Under the authority of the Urban Forestry Act, the Urban Forestry Program offers grants of over \$1 million dollars per year to plant trees, and over \$2.5 million for related forestry projects in urban communities throughout California.

CAL FIRE has identified five forestry strategies for reducing or mitigating GHG emissions, which are:

- + Reforestation to promote carbon sequestration
- + Forestland conservation to avoid forest loss to development
- + Fuel reduction to reduce wildfire emissions and utilization of those materials for renewable energy
- + Urban forestry to reduce energy demand through shading, increase sequestration, and contribute biomass for energy generation
- + Improved management to increase carbon sequestration benefits and protect forest health

These strategies were recognized by the Governor's Climate Action Team reports in 2006 and 2007, and by the Air Resources Board in its Climate Change Scoping Plan.

Climate Corps Bay Area

<http://www.climatecorps-bayarea.org/>

CCBA receives funding to place AmeriCorps members with local governments, public agencies and other nonprofits to work on energy and climate projects. Each CCBA member spends 11 months (1,700 hours of service) working on emissions reductions projects for their site organization. During this term of service, members will directly help communities to reduce their GHG emissions. Members cannot work directly on policy development or policy advocacy efforts. The goal for this program is for participating members to provide direct service to communities by working on projects that:

- + Realize measurable energy saving, clean energy and GHG reduction opportunities
- + Engage community members in activities that yield measurable energy and GHG benefits
- + Increase civic participation in community energy and climate efforts

Partnerships with Private Companies and Other Organizations

Numerous private companies provide renewable energy or green infrastructure. The success of the CAP depends in part on collaboration between these businesses and the city and public. For example, numerous companies are involved in developing electric plug-in auto charging station infrastructure throughout the Bay Area. PG&E also administers numerous energy efficiency and water conservation programs that the city can leverage and help advertise to residents. Solar companies will also be an important asset to the CAP, as the advent of the Power Purchase Agreement (PPA) enables businesses, residents, and the city to install solar panels and access solar power at no

cost. Partnering with new and existing businesses, will enable the city to save money and provide the community with the most up-to-date green infrastructure.

Power Purchase Agreements

Renewable energy has become increasingly more accessible and cost-effective due to Power Purchase Agreements (PPAs). In a PPA, a private company or third party installs a renewable energy technology, often solar panels, at no cost to the consumer and maintains ownership of the installed panels, selling customers the power produced on a per kilowatt-hour basis at a contractually-established rate. The rate is lower than what customers pay their utility today, and increases at a fixed percentage (usually 2.5 to 4.0 percent) annually which is typically lower than the rate escalation by the utilities. In addition to installing the panels, the third party monitors and maintains the systems to ensure functionality. The contract period for a PPA is typically 15 years, at which point the third party will either uninstall the panels or sign a new agreement with the building owner. These agreements are ideal for demonstration projects implemented by the city and residents or businesses with interests in reducing the carbon emissions associated with energy consumption in their homes and businesses. This form of financing systems such as solar PV systems is becoming increasingly popular in the Bay Area, with a number of companies specializing in this form of financial transaction.

Energy Savings Performance Contracting

The basic concept of the energy savings performance contract (ESPC) is that an Energy Services Company (ESCO) guarantees the amount of energy saved, and further guarantees that the value of that energy would be sufficient to make the debt service payments as long as the price of energy does not fall below a stipulated floor price. The key benefits of the guaranteed savings include:

- + The amount of energy saved is guaranteed
- + The value of energy saved is guaranteed to meet debt service obligations down to a stipulated floor price
- + The city carries the credit risk
- + A smaller piece of the investment package goes to “buy” money
- + Tax-exempt institutions can use their legal status for much lower interest rates
- + ESCO carries only the performance risk

Typically, an ESPC project would have a simple payback of 10 years or less to allow for the cost of money and other fees to be included in the overall project payback. Lending institutions look for less than 15 years including all fees.

Typical projects include:

- + Energy management systems
- + Interior and exterior lighting
- + Boiler replacement/repair of steam systems
- + High-efficiency HVAC systems
- + LED traffic systems
- + Wastewater treatment plant pumps and motors

There are numerous ESCOs with reliable track records throughout the state. As evidenced by the above project types, the ESPC financing option would be most applicable to municipal operations-related measures in this CAP. If the city were interested in demonstration projects for particular energy savings technologies, this financing mechanism would apply.

Energy Efficiency Mortgages

www.hud.gov/offices/hsg/sfh/eem/energy-r.cfm

Energy Efficiency Mortgages can provide owners additional financing (whether at time-of-sale or upon refinancing) for energy efficiency improvements at discounted interest rates. Energy efficiency upgrades could be chosen that would allow owners to realize a net monthly savings. The goal is to provide capital for energy efficiency upgrades at a discounted interest rate. The Federal Housing Administration (FHA) offers an Energy Efficient Mortgage Loan program. This program helps current or potential homeowners significantly lower their monthly utility bills by enabling them to incorporate the cost of adding energy-efficient improvements into their new home or existing housing. This FHA program eliminates the need for homeowners who are interested in making their home more energy efficient to take out an additional mortgage to cover the cost of the improvements. The improvements can be included in a borrower's mortgage only if the total cost is less than the total dollar value of the energy that will be saved during its useful life. The program is available as part of a FHA-insured home purchase or by refinancing a current mortgage loan.

ENERGY STAR, a program under the DOE, offers another energy efficient mortgage option, though it is in its pilot phase and not currently available in California. This program is designed to encourage comprehensive energy efficiency improvements to new and existing homes by increasing the affordability and availability of energy efficiency mortgages for homeowners and homebuyers. These mortgages include the cost of energy efficiency investments in the loans themselves so that borrowers can pay for those investments over the life of their loans, as well as deduct the interest from their federal and State income taxes. One of the key benefits of an ENERGY STAR mortgage is that a borrower can finance energy-saving improvements to their home without paying more than he/she would for a typical mortgage. Following the completion of the pilot phase, this program will be extended to California.

Partnerships with Other Jurisdictions and Organizations

As Dixon is a relatively small portion of Solano County in terms of population, partnering with neighboring jurisdictions is another key implementation strategy supporting the CAP. Various jurisdictions within Solano County could serve as potential partners in implementing the CAP strategies. The city should seek to partner with appropriate local governments, as identified in the CAP measure implementation sections, other potential partners including:

- + Solano Transportation Agency
- + Metropolitan Transportation Commission (MTC)
- + Association of Bay Area Governments (ABAG)
- + Pacific Gas & Electric (PG&E)
- + YSAQMD

- + Solano Economic Development Corporation
- + Solano Center for Business Innovation
- + Regional water districts
- + California ReLeaf
- + Sustainable Agriculture Education (SAGE)
- + United States Green Building Council (USGBC) – Northern California Chapter

Infrastructure Financing Districts

Local governments can finance a variety of infrastructure, public facilities, and related improvements through Infrastructure Finance Districts (IFDs). In 2014, AB 471 (Atkins) expanded the authority of cities and counties to establish and fund IFDs. An IFD may finance a project or portion of a project that is located in, or overlaps with, a redevelopment project area or former redevelopment project area and use tax increment financing (to the extent available after meeting former redevelopment agency debt and other financial obligations). As part of budget proposal, Governor Brown is proposing legislation to expand the use of IFDs, lower the voter threshold to create the districts from 2/3 to 55%, and allow.

Other Self-Financing Strategies

CAP measures include a range of incentives and regulations to change the community's behavior. It is important that the fees established in the CAP be self-financing. The money raised through the fees would then be used to implement the CAP measures determined to provide the best mitigation results. Dixon will actively explore opportunities to establish programs that are self-financing and thus sustainable over the long term.

Prospective Funding: Cap and Trade Revenue

Governor Brown has proposed several hundred million dollars in funding for transportation programs that would reduce GHG emissions. These are summarized below. A copy of the Legislative Analyst Office's report with more details is at:

<http://lao.ca.gov/reports/2014/budget/overview/budget-overview-2014.pdf>.

- + **Sustainable Communities \$100 million** – The Strategic Growth Council will administer this program in coordination with various departments to implement Sustainable Communities Strategies that improve transit ridership, increase active transportation, provide affordable housing near transit, as well as preserves agricultural lands and supports local planning efforts that promote infill development. A priority will be given to projects in disadvantaged communities.
- + **Low Carbon Transportation \$200 million** – The California Air Resources Board will use these funds to accelerate the transition to low carbon freight and passenger transportation, with a priority for disadvantaged communities. These funds will be used to augment the Air Board's existing programs that provide rebates for zero-emission cars and vouchers for hybrid and zero-emission trucks and buses.

- + **Transportation Management Programs** – \$100 million for traffic management mobility projects, \$9 million for active transportation projects, and \$5 million for environmental mitigation.
- + **Proposition 1B Bond Funds** – \$793 million to support local transit operators.



City of Fairfield Climate Action Plan

Public Review Draft
April 2014



City of Fairfield **Climate Action Plan**

Public Review Draft
April 2014

Prepared for:

City of Fairfield

Consultant to the City:



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CHAPTER I

INTRODUCTION: PLANNING FOR CLIMATE CHANGE



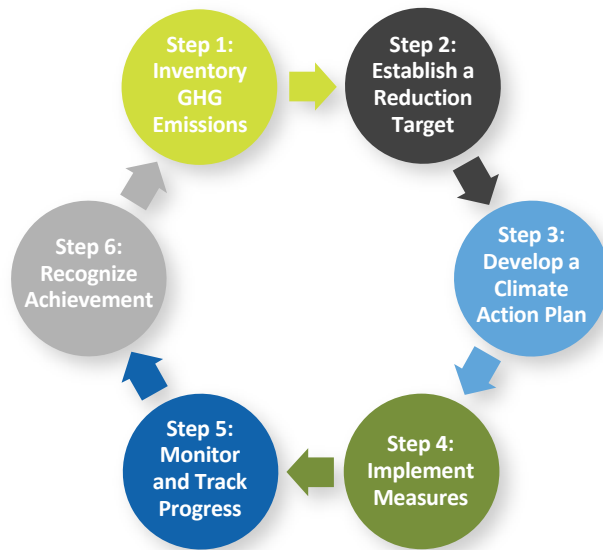
The State of California considers increasing greenhouse gas (GHG) emissions and resulting climate change impacts a major global challenge for the 21st century. According to most climatologists, the planet is starting to experience shifts in climate patterns and increased frequency of extreme weather events at both the global and local levels. At a statewide level, these impacts include reduced snow pack in the Sierra Nevada affecting California water supplies; rising sea levels threatening cities along the coast, San Francisco Bay, and Sacramento River; decreasing air quality affecting public health, particularly in the Central Valley; and, rising temperatures impacting the state's agricultural industry, including Solano County farmers and agricultural businesses.

This plan seeks to address these impacts by increasing local energy independence, improving building energy and water efficiency, supporting alternative transportation options, improving solid waste management, and establishing a regional framework for collaboration. This framework will build from the working relationships established during plan preparation to realize efficiencies in measure implementation among the various jurisdictions within Solano County.

What is a CAP?

A CAP (Climate Action Plan) is a tool that many cities in California are using to quantify their share of statewide GHG emissions and establish action steps toward achieving a local emissions reduction target. A CAP provides a set of strategies intended to guide community efforts to reduce GHG emissions, often through a combination of statewide and local actions. Figure 1.1 shows the typical steps included in the CAP development process.

Figure 1.1 – Steps in the CAP Development Process



A CAP contains community-specific GHG emission inventories and forecasts to establish a starting point and probable future emissions levels if no action is taken (Step 1). A reduction target is then defined to provide an aspirational goal for improvement (Step 2). Emission reduction measures and implementation programs are written to help the city meet its goal by achieving the reduction target (Step 3). Upon adoption of the CAP, the jurisdiction takes action to implement the reduction measures (Step 4), monitor their progress towards achievement of the reduction target (Step 5), then evaluate effectiveness, celebrate their successes, and use the monitoring results to make adjustments to CAP measures to improve performance (Step 6). This CAP represents the city's progress on Steps 1-3, which are described in more detail below.

Purpose

The climate action planning process seeks to identify measures which are informed by the goals, values, and priorities of the community, while also contributing to the state's climate protection efforts and complying with any applicable Air Quality District standards for GHG emissions. In addition, the CAP measures are intended to increase community resilience and efficiency of human / economic activities that consume resources which, in turn, lead to greenhouse gas emission (e.g., increasing local energy

independence, reducing transportation-related emissions, improving building energy and water efficiency, and extending the life of area landfills). The CAP can also support regional collaborations among local jurisdictions on climate change issues. There are also California Environmental Quality Act (CEQA) review streamlining benefits for development projects occurring within a jurisdiction that has an adopted CAP.

Context

Many local governments in California are using CAPs to quantify their share of statewide GHG emissions and establish action steps toward achieving a local emissions reduction target. Jurisdictions within Solano County already have a history of taking a leadership role in this area. The cities of Benicia and Vallejo and the County of Solano have already adopted climate action plans. In addition, the City of Vacaville released its Public Review Draft CAP in late 2013 for public review and comment. The City of Fairfield's (city) efforts are complimentary to those already taken by its neighbors and are part of a regional effort described below.

CAPs typically address emissions targets through reduced dependency on fossil fuels and nonrenewable energy sources, increased energy and water efficiency, land use and technological changes that reduce transportation emissions, and improved waste management strategies. CAPs also provide a way to connect climate change mitigation (GHG reduction) to climate adaptation, community resilience, and broader community goals.

In Fairfield, GHG emissions come from energy used in buildings, gasoline burned in motor vehicles and power equipment, water and wastewater treatment and conveyance, and solid waste disposal. Fairfield's CAP examines the communitywide activities that result in GHG emissions and establishes strategies to help reduce those emissions in existing and future development through both voluntary and mandatory actions. The CAP also considers the local impact of federal and statewide actions to reduce GHG emissions.

In addition to reducing greenhouse gases, many of the strategies included in this plan will also help make Fairfield a more attractive place to live – lowering energy and water bills through conservation, improving circulation through bike and pedestrian facility enhancements, improving air quality, and reducing waste generation to extend the lifetime of local landfills.

Process

This CAP was prepared as part of a Solano County regional-effort, involving the cities of Dixon, Fairfield, Rio Vista, and Suisun City (the participating cities). The intent of preparing this CAP through a regional collaborative process was to establish a common list of reduction measures so that no one jurisdiction would become economically (dis)advantaged through its CAP actions, and to find collaborative opportunities for plan implementation. To that end, the reduction measures contained within Chapter 3 were developed through a collaborative and simultaneous process among the participating cities. The previously adopted CAPs within the county were also reviewed during the measure development process to ensure countywide consistency to the extent possible.

FUNDING

PG&E GREEN COMMUNITIES PROGRAM

The four participating cities, along with the City of Vacaville, received funding through the Pacific Gas & Electric Company's (PG&E's) Green Communities Program to prepare energy efficiency climate action plans. These plans included many components of a full CAP, including evaluation of baseline emissions, future energy use forecasts, target setting, and the development of energy efficiency measures. These draft energy plans were presented to the Planning Commissions of each participating jurisdiction for their review and comment. The resulting information prepared during that effort has been incorporated throughout this full CAP.

STRATEGIC GROWTH COUNCIL PLANNING GRANT

The participating cities also received funding from the Strategic Growth Council (SGC) to develop the remaining non energy-related components of their CAP. This included preparing emissions forecasts for the transportation, solid waste, wastewater, and water sectors, as well as development of reduction measures targeting these sectors. This work was combined with the PG&E-funded draft energy plans to create a comprehensive CAP for each city.

Though similar in many ways, the participating cities each developed a customized CAP, relevant to their community's specific context.

PUBLIC STAKEHOLDER ENGAGEMENT

The project team kept the public, city staff, and elected officials informed and involved during the CAP development process. Stakeholder input was solicited at project milestones through a Regional Technical Advisory Committee (RTAC), at Solano City County Coordinating Council (4C's) meetings, community workshops, and Planning Commission presentations. See Table 1.1 for a list of the public stakeholder engagement activities.

RTAC

The Regional Technical Advisory Committee was formed during the project kick-off phase in June 2012 under the direction of the Solano Transportation Authority. City staff, local business community representatives, and regional agency staff were invited to participate in order to:

- + help gauge project feasibility and success
- + provide feedback on interim documents
- + help make project meaningful and beneficial for all communities
- + review, comment on, and discuss measures and implementation framework
- + support public outreach and future implementation efforts

The RTAC met nine times between June 2012 and October 2013. The first five meetings were committed to development of the PG&E-funded Energy Efficiency CAPs (EECAPs). The last four meetings focused on the SGC-funded portions of the CAPs, as well as

identification of regional implementation opportunities. Table 1.2 lists RTAC members who participated at various points of the CAP development process.

Table 1.1 Public Stakeholder Engagement Overview				
Meeting	Date	Location	Topic/Task	Stakeholders
STA/PGE EECAP Project Kickoff Workshop	June 13-14, 2012	STA Offices	Project kick off and policy gap analysis	City planners, Planning Commissions, City Councils
Community Workshop #1	July 12, 2012	Administration Center	Project kick-off; energy efficiency in participating cities	All
RTAC Meeting #1	July 24, 2012	STA Offices	RTAC kick-off; discuss policy gap analysis	RTAC members
4C's Meeting #1	August 9, 2012	Solano County Water Agency	Overview of project process	4C's Mayors and Supervisors
RTAC Meeting #2	August 28, 2012	STA Offices	Draft actions and measures (Energy)	RTAC members
RTAC Meeting #3	September 25, 2012	STA Offices	Administrative Draft Energy Efficiency CAPs	RTAC members
RTAC Meeting #4	October 23, 2012	STA Offices	Public Review Draft comments	RTAC members
RTAC Meeting #5	November 27, 2012	STA Offices	Planning Commission presentation preparation	RTAC members
Planning Commission Presentations – Energy Efficiency CAPs	November/ December 2012	Dixon, Fairfield, Rio Vista, and Suisun City	Present Draft Energy Efficiency CAPs; discuss next steps	City Planners, Planning Commissions, City Councils, Business Alliance
RTAC Meeting #6	April 16, 2013	STA Offices	Project kick-off for SGC-funded portion of CAPs; overview and schedule	RTAC members
4C's Meeting #2	May 9, 2013	Solano County Water Agency	Target setting and reduction gaps to be addressed by non-energy measures	4C's Mayors and Supervisors
RTAC Meeting #7	May 30, 2013	STA Offices	Preliminary measures list (non-energy), full emissions forecasts, targets and remaining reduction gaps	RTAC members
RTAC Meeting #8	June 18, 2013	STA Offices	Community workshop overview; regional implementation opportunities	RTAC members
Community Workshop #2	June 27, 2013	Solano County Events Center	Presentation of preliminary measures; participation activity to rank CAP measure options; community questionnaire	All
RTAC Meeting #9	October 22, 2013	STA Offices	Review draft measures and actions; discuss gap-filling measures to achieve targets	RTAC members
4C's Meeting #3	November 14, 2013	Solano County Water Agency	Progress report	4C's Mayors and Supervisors
4C's Meeting #4	May 8, 2014	Solano County Water Agency	Presentation of Public Review Draft CAPs	4C's Mayors and Supervisors

Table 1.2
RTAC Members

Name	Organization
Michael Neward	Bay Area Air Quality Management District
Alex Porteshawver	City of Benicia
Dave Dowswell	City of Dixon
David Feinstein / Brian Miller	City of Fairfield
Dave Melilli / John Degele	City of Rio Vista
John Kearns	City of Suisun City
Tyra Hays	City of Vacaville
Michelle Hightower	City of Vallejo
Dave Hunt	Gymboree
Chuck Rieger	Solano Center for Business Innovation
Matt Walsh	Solano County
Sandy Person	Solano Economic Development Corporation
Chris Lee / Any Floreno / David Okita	Solano County Water Agency
Mona Babauta	Soltrans Ride
Mathew Ehrhardt	Yolo Solano Area Air Quality Management District

4Cs

The Solano County Board of Supervisors and the mayors of the seven Solano County cities comprise the Solano City County Coordinating Council (CCCC) or “4Cs”, whose purpose is to improve countywide communication and coordination on issues of regional importance. The project team attended four meetings with the 4Cs to give CAP status updates and receive input to define the project’s regional approach.

PUBLIC WORKSHOPS

Two public workshops were held to gather community input on the initial list of CAP reduction measures. The workshops were open to all county residents and broadly advertised in local media, on STA’s website, and through email announcements distributed through local email lists from participating city staff. Flyers were also posted at the Solano County Administrative Center, where the workshops were held, and in downtown Fairfield. The first workshop in July 2012 focused on the energy efficiency plans, while the second in June 2013 included discussion of all emissions sectors. At both workshops, the public was encouraged to fill out a survey and talk to city staff representatives about the CAP specifics of each city. Even though some community members questioned the need to reduce GHGs, overall feedback for the effort to increase efficiencies was positive and the survey responses showed that many community members are already actively supporting resource conservation by composting and making efforts to conserve energy. PG&E staff attended the workshops to provide information on available energy efficiency programs and resources. The project team also presented an overview of the CAP planning process and facilitated a question and answer session. Community members were given another chance to comment at the Planning Commission and City Council meetings where the Draft Energy Efficiency CAPs (in 2012) and the Public Review Draft CAPs (in 2014) were presented.

Scope and Content of the Climate Action Plan

The CAP consists of four chapters: 1) Introduction: Planning for Climate Change; 2) Baseline Emissions Inventory, Forecasts, and Targets; 3) Emissions Reduction Measures; and 4) Benchmarks and Implementation. Appendices A through E provide additional detail on topics covered within the plan. The contents of each chapter and appendix are briefly described below.

- + **Chapter 1, Introduction: Planning for Climate Change**, describes the city's rationale for preparing a CAP, as well as the goals of the CAP to comply with local Air Quality Management District guidelines, as applicable. This chapter provides an overview of the topics covered in the CAP, presents conventional climate change science findings, and describes statewide actions to address climate change. This chapter also introduces the CAP's relationship to General Plan Environmental Impact Reports (EIRs), and its ability to enable a CEQA tool known as "tiering" to allow consistent future discretionary development projects to skip certain steps in the traditional CEQA process.
- + **Chapter 2, Baseline Emissions Inventory, Forecasts + Targets**, outlines key steps taken to develop the CAP, including preparing the 2005 baseline GHG inventory, forecasting future emissions for 2020 and 2035, and setting a near-term communitywide GHG reduction target for 2020 and a long-term target for 2035. This chapter also describes the emissions gap between the reduction targets and estimated statewide reductions.
- + **Chapter 3, Emissions Reduction Measures**, presents local measures developed for the five main reduction strategy areas: energy, transportation and land use, solid waste, water, and green infrastructure. This chapter provides a description of the reduction measure development process. Each local measure also includes a description of existing related programs and accomplishments, measure implementation actions, performance metrics against which to measure success, and estimated GHG reductions in 2020 and 2035.
- + **Chapter 4, Benchmarks and Implementation**, describes the process to monitor progress towards achieving the city's GHG reduction targets. This chapter identifies monitoring procedures, plan update processes, and other steps to ensure successful implementation.
- + **Appendix A – Emissions Inventory Methodology** provides a technical description of the methodology used to prepare for the 2005 emission inventory and 2020 and 2035 emissions forecasts.
- + **Appendix B – Target Setting Rationale** provides background information describing how the 2020 and 2035 reduction targets were selected.
- + **Appendix C – BAAQMD Qualification Standards** describes how the CAP conforms to the Bay Area Air Quality Management District (BAAQMD) guidelines for qualifying greenhouse gas reduction plans.
- + **Appendix D – Emissions Reduction Quantification Methodology** provides assumptions used to determine the GHG emission reductions associated with statewide and local actions.

- + **Appendix E – Economic Analysis** presents documentation to support the measure implementation cost ranges included in Chapter 3.

Climate Change Science

According to the US Environmental Protection Agency, global warming refers to the recent and ongoing rise in global average temperature near Earth’s surface, and is caused primarily by increasing concentrations of greenhouse gases in the atmosphere. Global warming is causing climate patterns to change. However, global warming itself represents only one aspect of climate change.

Climate change refers to any significant change in the measure of climate lasting for an extended period of time, including major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer.ⁱ

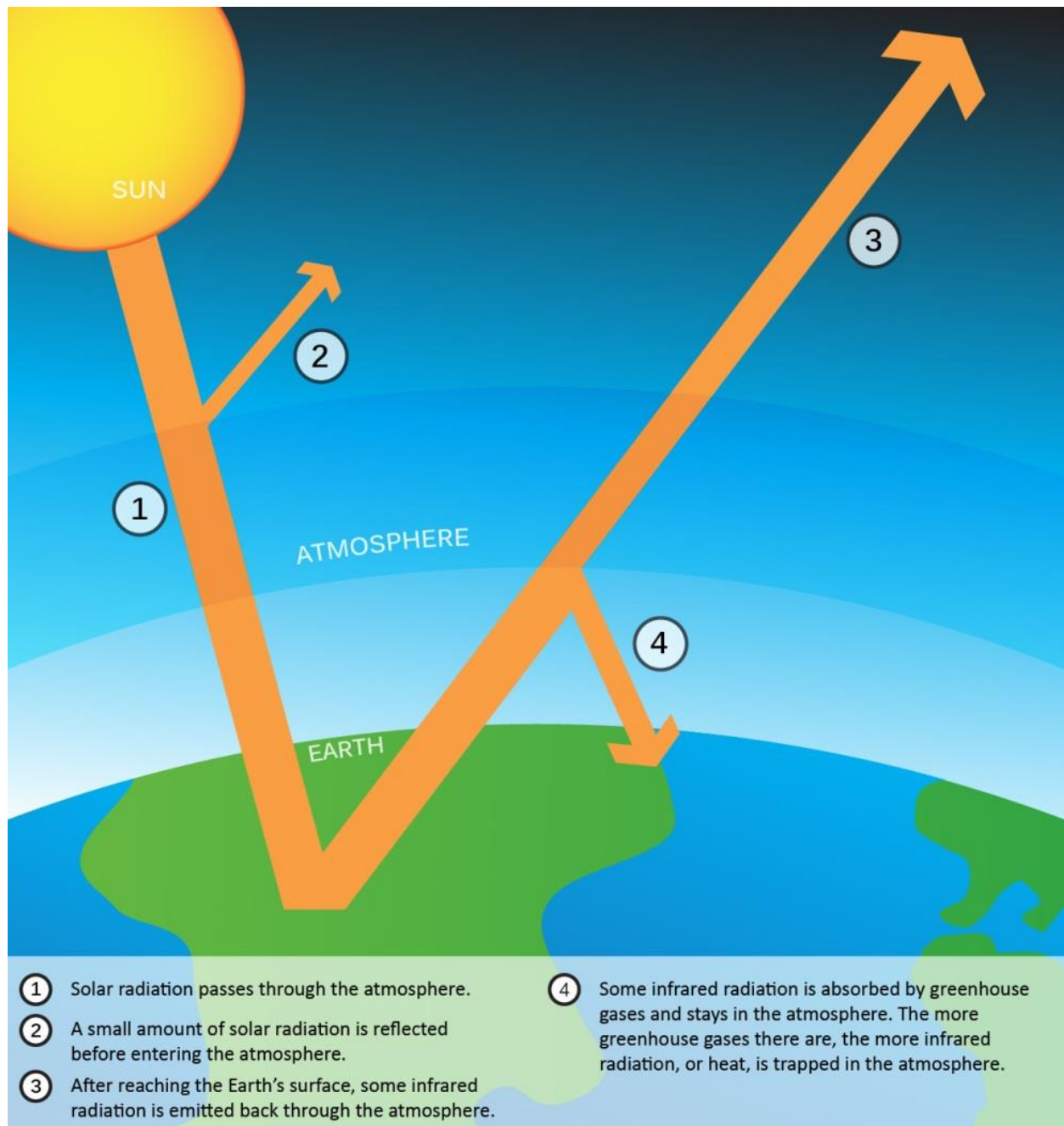
Over the past century, human activities have released large amounts of carbon dioxide (CO₂) and other greenhouse gases into the atmosphere. Greenhouse gases act like a blanket around Earth, trapping energy in the atmosphere and causing it to warm. This phenomenon is called the greenhouse effect and is natural and necessary to support life on Earth. However, the buildup of greenhouse gases can change Earth's climate and result in dangerous effects to human health and welfare and to ecosystems.ⁱⁱ Figure 1.2 provides a simple illustration of the greenhouse effect.

In the United States, 83.6% of GHG emissions are from CO₂, with 94.4% of CO₂ emissions coming from the burning of fossil fuels.ⁱⁱⁱ Trend projections indicate that atmospheric concentrations of GHG emissions will continue to increase throughout this century. If these projections become reality, climate change will threaten our economic well-being, public health, and environment.

California has an advantage in its scientific understanding of climate change and its local effects. A solid body of vital data is available to assist state and local leaders to better understand how climate change is affecting us now, what is in store ahead, and what we can do about it. State-sponsored research has played a major role in recent advances in our understanding of the potential impacts of climate change on California. A first assessment, published in 2006, made clear that the level of impact is a function of global greenhouse gas emissions and that lower emissions can significantly reduce those impacts.^{iv} The third and most recent publication, *The 2012 Vulnerability and Adaptation Study*, explores local and statewide vulnerabilities to climate change, highlighting opportunities for taking concrete actions to reduce climate-change impacts.^v

The California legislature passed legislation (addressed below) based upon the findings of the most comprehensive, advanced, and thoroughly reviewed documents on the science of climate change. The development of CAPs in California, including those in Solano County, is based upon the actions of the California legislature and its reliance on these findings. For further information on Climate Science, please visit the California Climate Change Portal at <http://www.climatechange.ca.gov/>.

Figure 1.2 – Greenhouse Effect



BENEFITS OF ADDRESSING GHG EMISSIONS

Planning efforts intended to reduce GHG emissions through resource efficiency and conservation measures often have multiple co-benefits as well that will improve the local quality of life. While some co-benefits are qualitative, others are quantifiable improvements over current conditions.

This plan references a list of co-benefits to illustrate the overlapping benefits of various CAP measures, though the list used is in no way exhaustive. Overall, these co-benefits:

- + Strengthen local economic development (e.g., CEQA streamlining/tiering, transparent development requirements)
- + Demonstrate regional sustainability leadership
- + Support climate change adaptation strategies and community resilience

The following co-benefits are identified in Chapter 3 next to the applicable local reduction measures:

- + Improves air quality
- + Reduced energy use
- + Promotes regional smart growth
- + Reduces traffic congestion
- + Reduces water use; extends community water supply
- + Improves water quality; reduces stormwater run-off
- + Improves local energy independence
- + Increases natural habitat
- + Reduces heat island effect
- + Improves public health
- + Creates local jobs
- + Reduces waste; extends landfill lifespan
- + Provides long-term savings to residents, businesses, and local governments
- + Raises community awareness

California Climate Change Actions

Fairfield's strategy for climate protection, as one of eight local plans in the Solano County regional climate action planning effort, must be set within the context of the Bay Area and the State, where much of the momentum for local action in the United States originates.

California has long been a sustainability leader, as illustrated by Governor Schwarzenegger signing Executive Order (EO) S-3-05 in 2005. EO S-3-05 recognizes California's vulnerability to a reduced snowpack, exacerbation of air quality problems,

and potential sea-level rise due to a changing climate. To address these concerns, the governor established targets to reduce statewide GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050.

In 2006, California became the first state in the country to adopt a statewide GHG reduction target, through the adoption of Assembly Bill 32 (AB 32). This law codifies the EO S-3-05 requirement to reduce statewide emissions to 1990 levels by 2020. AB 32 resulted in the California Air Resources Board (ARB) adoption of a *Climate Change Scoping Plan* (Scoping Plan) in 2008. The Scoping Plan outlines the state's plan to achieve emission reductions through a mix of direct regulations; alternative compliance mechanisms; and different types of incentives, voluntary actions, market based mechanisms, and funding. The Scoping Plan addresses similar areas to those contained in this CAP, including building energy efficiency, transportation, waste reduction, water conservation, and green infrastructure.

AB 32 engendered several companion laws that can assist Fairfield in reducing communitywide GHG emissions to achieve its local target. These legislative actions and regulations are referred to as statewide actions throughout this plan, and represent a significant source of estimated GHG reductions. The CAP estimated GHG emission reductions associated with:

- + Renewable Portfolio Standard (RPS),
- + AB 1109 Lighting Efficiency
- + California 2013 Building Energy Efficiency Standards,
- + AB 1493 Pavley I and II
- + EO-S-1-07 Low Carbon Fuel Standard, and
- + Vehicle Efficiency Regulations.

As the regulatory framework surrounding AB 32 grows, it may be possible to evaluate a wider range of statewide reductions.

RENEWABLE PORTFOLIO STANDARD

Senate Bill (SB) 1078, SB 107, EO-S-14-08, and SB X1-2 have established increasingly stringent Renewable Portfolio Standard (RPS) requirements for California utilities. RPS-eligible energy sources include wind, solar, geothermal, biomass, and small-scale hydro.

- + **SB 1078** required investor-owned utilities to provide at least 20% of their electricity from renewable resources by 2020.
- + **SB 107** accelerated the SB 1078 timeframe to take effect in 2010.
- + **EO-S-14-08** increased the RPS further to 33% by 2020. PG&E, Fairfield's electricity provider, delivered 12.1% of its electricity from RPS-eligible renewable sources in 2005 and 19% in 2011.
- + **SB X1-2** codified the 33% RPS by 2020 requirement established by EO-S-14-08.

AB 1109 – LIGHTING EFFICIENCY

AB 1109 was signed into law in 2007. The California Lighting Efficiency and Toxics Reduction Act requires the California Energy Commission to adopt energy efficiency standards for all general purpose lights, reducing lighting energy usage in indoor residences and state facilities by no less than 50%, by 2018, as well as require a 25% reduction in commercial facilities by that same date. To achieve these efficiency levels, the California Energy Commission applied its existing appliance efficiency standards to include lighting products, as well as required minimum lumen/watt standards for different categories of lighting products. In addition, the bill prohibits the manufacturing for sale or the sale of certain general purpose lights that contain hazardous substances.

2013 BUILDING ENERGY EFFICIENCY STANDARDS

California's Building Standards Code (California Code of Regulations Title 24) dictates how new buildings and major remodels are constructed in California. The Building Energy Efficiency Standards (Title 24, Part 6), are a subset of the state building code, which detail energy efficiency standards for residential and non-residential development. The standards are updated on an approximately three-year cycle. The state has further increased building energy conservation requirements through adoption of the 2013 standards, which go into effect July, 1 2014. It is estimated that these revisions to the current 2008 Building Energy Efficiency Standards will result in energy consumption reductions of 25% over the current standards.

The California Green Building Standards Code (California Code of Regulations Title 24, Part 11) includes additional requirements for new construction and renovation projects that may also result in emissions reductions. This plan does not include these reductions as a separate measure. However, the impact of these requirements may be accounted for in other statewide or local reduction measures (e.g., construction and demolition waste diversion requirements).

NET ZERO ENERGY NEW BUILDINGS

In the *2007 Integrated Energy Policy Report*, the CEC adopted a goal to achieve net zero energy buildings in new residential construction by 2020 and non-residential construction by 2030. A net zero energy building consumes only as much energy on an annual basis as can be generated with an on-site renewable energy system (e.g., solar, wind, geothermal). While the pathway to realize this goal has not yet been defined, this plan considers the future impact of this measure as part of an illustration to show what it will take to achieve the city's longer-term emissions reduction target (see Chapter 3 for further description).

AB 1493 – PAVLEY I AND II

AB 1493, California's mobile-source GHG emissions regulations for passenger vehicles, or California Clean Car Standards, was signed into law in 2002. AB 1493 requires ARB to develop and adopt regulations that reduce GHG emissions from passenger vehicles, light-duty trucks, and other non-commercial vehicles for personal transportation. In 2004, ARB approved amendments to the California Code of Regulations adding GHG emissions standards to California's existing standards for motor vehicle emissions.

EO-S-1-07 – THE LOW CARBON FUEL STANDARD

EO-S-01-07 reduces the carbon intensity of California's transportation fuels by at least 10% by 2020. The Low Carbon Fuel Standard (LCFS) is a performance standard with flexible compliance mechanisms that incentivizes the development of a diverse set of clean, low-carbon transportation fuel options to reduce GHG emissions.

VEHICLE EFFICIENCY REGULATIONS

ARB has adopted several regulations to reduce emissions through improved vehicle efficiency that will have local GHG emission reduction benefits in Fairfield. The following two regulations were quantified and included as part of this CAP.

TIRE INFLATION REGULATION

On September 1, 2010, ARB's Tire Pressure Regulation took effect. The purpose of this regulation is to reduce GHG emissions from vehicles operating with under-inflated tires by inflating them to the recommended tire pressure rating. The regulation applies to vehicles with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. Under this regulation, automotive service providers must meet the following requirements:

- + Check and inflate each vehicle's tires to the recommended tire pressure rating, with air or nitrogen, as appropriate, at the time of performing any automotive maintenance or repair service.
- + Indicate on the vehicle service invoice that a tire inflation service was completed and the tire pressure measurements after the service were performed.
- + Perform the tire pressure service using a tire pressure gauge with a total permissible error no greater than + two (2) pounds per square inch (psi).
- + Have access to a tire inflation reference that is current within three years of publication.
- + Keep a copy of the service invoice for a minimum of three years, and make the vehicle service invoice available to the ARB, or its authorized representative upon request.

HEAVY-DUTY VEHICLE GHG EMISSION REDUCTION (AERODYNAMIC EFFICIENCY)

This regulation requires existing trucks/trailers to be retrofitted with the best available technology and/or ARB-approved technology to increase vehicle aerodynamics and fuel efficiency that will result in GHG reductions. This measure has been identified as a Discrete Early Action in the Scoping Plan, which means it must be enforceable beginning in 2010. Technologies that reduce GHG emissions and improve the fuel efficiency of trucks may include devices that reduce aerodynamic drag and rolling resistance. These requirements apply to both California-registered trucks and out-of-state registered trucks that travel to California.

SB 375

The Sustainable Communities and Climate Protection Act of 2008 (SB 375) was adopted to support statewide GHG reduction efforts through coordinated transportation and land use planning. SB 375 seeks to:

- + Use the regional transportation planning process to help achieve AB 32 goals.
- + Use CEQA streamlining as an incentive to encourage transit-oriented residential projects that help achieve AB 32 goals.
- + Coordinate the regional housing needs allocation process with the regional transportation planning process, providing monetary incentives for sustainable development.

Under SB 375, ARB set regional targets for GHG emissions reductions from passenger vehicle use. In 2010, ARB established these targets for 2020 and 2035 for each region covered by one of the State's Metropolitan Planning Organizations (MPO). Each of California's MPOs must prepare a "sustainable communities strategy" (SCS) as an integral part of its regional transportation plan. The SCS contains land use, housing, and transportation strategies that, if implemented, would allow the region to meet its GHG emission reduction targets. The Metropolitan Transportation Commission (MTC) is the MPO for nine Bay Area counties, including Solano County. As such, MTC developed *Plan Bay Area* as its long-range integrated land use and housing strategy, and includes the region's SCS and RTP.

This CAP was developed using household and employment projections from *Plan Bay Area* as well as future travel demand for 2020 and 2035 from MTC's transportation model to provide consistency between the CAP and the SCS. While there are no discrete SB 375 emissions reductions included in the CAP, the transportation emission forecasts were developed using modeled travel data from the SCS, thereby incorporating compliance with SB 375 into the CAP.

Relationship to the General Plan

Whether by local desire, guidance from the State of California, or both, cities and counties are increasingly addressing climate change in their General Plans through the inclusion of policies and programs that have a co-benefit of reducing GHG emissions. The city's policy commitment includes encouraging higher density, mixed-use and infill development in appropriate locations, energy efficiency, and renewable energy development that contribute to GHG reduction strategies contained in the CAP. Since GHG emissions are a cross-cutting issue addressed by many General Plan elements, the CAP as a whole is generally considered an implementation measure for the General Plan. This structure allows the city to update the CAP on an ongoing, as-needed basis to ensure that their climate protection efforts reflect both current legislation and emerging best practices.

In addition, several state agencies have provided guidance and case studies for local governments to address climate change in their General Plans. For example:

- + Since 2008, the California Attorney General’s office has provided guidance to local governments on addressing climate change and greenhouse gas reduction through General Plan policies.
- + The California Office of Planning and Research (OPR) is preparing an update to the state’s *General Plan Guidelines* that will include guidance for GHG emissions reduction and climate adaptation.
- + The California Natural Resources Agency has released a Climate Adaptation Policy Guide for local governments.
- + The California Department of Housing and Community Development has released a guidance document on General Plan housing element policies and programs addressing climate change with case study examples.
- + The Office of Planning and Research prepared a guidance document for addressing complete streets in General Plans as required by AB 1358.

Relationship to the California Environmental Quality Act

Local governments may prepare a Plan for Reduction of Greenhouse Gases that is consistent with AB 32 goals. By preparing such a plan, the city can streamline CEQA review of subsequent plans and projects consistent with the GHG reduction strategies and target in the plan. To meet the standards of a qualified GHG reduction plan, Fairfield’s CAP must achieve the following criteria (which elaborate upon criteria established in State CEQA Guidelines Section 15183.5[b][1]):

- + Complete a baseline emissions inventory and project future emissions
- + Identify a community-wide reduction target
- + Prepare a CAP to identify strategies and measures to meet the reduction target
- + Monitor effectiveness of reduction measures and adapt the plan to changing conditions
- + Adopt the CAP in a public process following environmental review

This approach allows jurisdictions to analyze and mitigate the significant effects of GHGs at a programmatic level, by adopting a plan for the reduction of GHG emissions. Later, as individual projects are proposed, project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review in their cumulative impacts analysis. Project-specific environmental documents prepared for projects consistent with the CAP may rely on the programmatic analysis of GHGs contained in the CAP’s corresponding CEQA document. Chapter 4 provides a discussion

of the criteria and process the city will use to determine if a future project is consistent with the CAP.

A project-specific environmental document that relies on this CAP for its cumulative impacts analysis must identify specific CAP measures applicable to the project, and how the project incorporates the measures. If the measures are not otherwise binding and enforceable, they must be incorporated as mitigation measures applicable to the project. If substantial evidence indicates that the GHG emissions of a proposed project may be cumulatively considerable, notwithstanding the project's compliance with specific measures in this CAP, an EIR must be prepared for the project.

QUALIFIED GREENHOUSE GAS REDUCTION STRATEGY

BAAQMD encourages such planning efforts and recognizes that careful early planning by local agencies is invaluable to achieving the state's GHG reduction goals. If a project is consistent with an adopted qualified GHG Reduction Strategy that addresses the project's GHG emissions, it can be presumed that the project will not have significant GHG emissions under CEQA. This CAP meets the definition of a Plan for Reduction of Greenhouse Gases under CEQA. Appendix C provides a discussion regarding how the CAP also meets BAAQMD's Plan Level Guidance (Section 4.3 of the Air District's CEQA Guidelines) for the content of a "Qualified GHG Reduction Strategy" that is consistent with AB 32 goals and *CEQA Guidelines* relating to GHGs. This guidance is important if a city or county desires to use a climate action plan to support tiering of future development projects for purposes of CEQA review of GHG impacts.

Notes

ⁱ US Environmental Protection Agency. Climate Change Basics. Accessed December 4, 2012. Available at: <http://www.epa.gov/climatechange/basics/>.

ⁱⁱ Ibid.

ⁱⁱⁱ US Environmental Protection Agency. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010. April 15, 2012. Accessed December 4, 2012. Available at: <http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html>.

^{iv} California Climate Change Center. Our Changing Climate – Assessing the Risks to California: A Summary Report from the California Climate Change Center. August 2006. Accessed December 4, 2012. Available at: <http://www.energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2006-077>.

^v California Climate Change Center. Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California. July 2012. Accessed December 4, 2012. Available at: <http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf>.

CHAPTER 2

EMISSIONS INVENTORY, FORECASTS + TARGETS

2

This chapter examines Fairfield’s current and future communitywide greenhouse gas (GHG) emissions. It outlines the first few steps of the CAP development process, including preparing the 2005 baseline GHG inventory, forecasting future emissions for 2020 and 2035, and setting communitywide GHG reduction targets. These first steps are the foundation upon which locally appropriate reduction measures were later developed. This chapter also presents estimated reductions resulting from statewide actions, and compares their impact to Fairfield’s emissions reduction targets. This comparison frames the reductions gap, which is then addressed through local CAP measures described in Chapter 3.

Baseline Inventory (2005)

The purpose of a baseline inventory is to provide a snapshot of communitywide GHG emissions in a given year. A baseline inventory allows the city to identify major sources of emissions within the community, and then develop meaningful reduction measures that address the major emissions contributors. The city developed its baseline emissions inventory for the 2005 operational year as part of a countywide climate action planning effort in 2011. Fairfield is located within the Bay Area Air Quality Management District's (BAAQMD) jurisdictional boundary. Therefore, the city's inventory was calculated to be consistent with BAAQMD's GHG Plan Level Quantification Guidance. Some participating cities are located within the Yolo Solano Air Quality Management District's (YSAQMD) jurisdiction. At the time of CAP preparation, YSAQMD had not developed specific GHG inventory guidance, so these cities were also calculated to be consistent with BAAQMD's guidance. This approach allowed all of the jointly-prepared GHG inventories and CAPs to be developed in a consistent manner. See Appendix A for the emissions inventory methodology.

EMISSIONS SECTORS

The baseline inventory organizes emissions into categories, or sectors, based on the emissions sources. Fairfield's inventory includes emissions from the following sectors:

- + Energy (electricity and natural gas)
- + Transportation
- + Solid Waste
- + Off-Road Equipment
- + Potable Water
- + Wastewater

Energy

In general, energy emissions are generated through the combustion of fossil fuels to generate electricity or directly provide power (e.g., natural gas combustion for water heating). The energy sector includes the use of electricity and natural gas in residential, commercial, and industrial land uses within the legal boundaries of the city. Although emissions associated with electricity production are likely to occur in a different jurisdiction, the emissions are considered to be measured at the point of use and not the point of generation. Consumers are thus considered accountable for the generation of those emissions. Electricity-related GHG emissions are considered indirect emissions. Indirect emissions are those that are generated as a result of activities occurring within the jurisdiction, but occur in different geographic areas. For example, a Fairfield resident may consume electricity within the city, but the electricity may be generated in a different region. Direct emissions are those where the consumption activity directly generates the emissions, such as natural gas combustion for heating or cooling.

The Pacific Gas and Electric Company (PG&E) provides electricity and natural gas to all cities within Solano County, and provided electricity and natural gas consumption data to develop the baseline inventory. PG&E provided all electricity and natural gas consumption data in the form of kilowatt-hours per year (kWh/yr) and therms per year

(therms/yr), respectively. Electricity-related GHG emissions were quantified using a PG&E-specific emission factor that accounts for PG&E's 2005 electricity production portfolio (e.g., the mix of coal, oil, wind, solar and other sources of electricity production). Natural gas GHG emissions were also quantified using a PG&E-specific natural gas emissions factor.

Transportation

Transportation emissions come from vehicle trips that begin and/or end within Fairfield's boundaries. Pass through trips (for example, non-local drivers on Interstate 80) are not included within Fairfield's emissions inventory because the CAP measures would not affect those emissions. This sector includes GHG exhaust emissions from both private vehicles and city-owned vehicles. Unlike most of the other emissions sectors where activity data is available to more precisely calculate actual resource consumption (e.g., electricity used, wastewater generated, solid waste disposed), the transportation sector relies upon travel models to estimate vehicle use within a community. Travel models estimate the total vehicle miles traveled (VMT) within a community, which can then be combined with vehicle fuel emissions factors to estimate transportation-related emissions.

For this CAP, VMT data were acquired from the new Metropolitan Transportation Commission (MTC) activity-based travel model. This model provides VMT data separated by trip origin and destination. The VMT associated with vehicle trips that would originate or terminate within the city were attributed to the city's transportation sector. The MTC model also provides commercial vehicle VMT within a jurisdiction, though calculated differently than the passenger vehicle trips.

Emission factors for the transportation sector were obtained from the California Air Resources Board's (ARB) vehicle emissions model, EMFAC2007. EMFAC2007 is a mobile source emission model for California that provides vehicle emission factors by both county and vehicle class. Solano County-specific emission factors were used in this emissions inventory.

Solid Waste

The solid waste sector includes emissions associated with solid waste disposal. During the solid waste decomposition process, only organic materials release GHGs. Carbon dioxide emissions are generated under aerobic conditions (i.e., in the presence of oxygen), such as when composting. Methane (CH₄) emissions are generated under anaerobic conditions (i.e., in the absence of oxygen), as in many landfill environments. Waste collection and hauling activities also generate GHG exhaust emissions. However, hauling-related emissions are assumed to be included within the MTC commercial vehicle model and represented within the transportation sector.

Solid waste generated within the city is primarily sent to the Potrero Hills landfill. Annual tons of solid waste generated by land uses and waste categorization data were provided by city staff and CalRecycle. The first-order-decay method was used to estimate methane landfill emissions to incorporate the time factor of the solid waste degradation process, which can take decades to occur.

Off Road Equipment

Off-road equipment emissions can come from local construction and mining activities, operation of lawn and garden equipment (e.g., lawn mowers, leaf blowers), and use of light commercial/industrial equipment (e.g., backhoes, forklifts).

Data for construction, mining, light commercial, industrial, and lawn and gardening equipment were obtained from ARB's OFFROAD2007 model, which provides county-level emissions factors for off-road equipment. OFFROAD2007 provides total off-road equipment emissions by county, so applicable indicators specific to Fairfield were used to allocate the city's share of total county-wide emissions (e.g., building permits, households, retail jobs). Similar to the transportation sector, these emissions are modeled and not based on specific activity data.

Potable Water

The potable water sector includes energy emissions associated with water treatment, distribution, and conveyance. Water consumption data was provided by city staff. The California Energy Commission's water-energy intensity studies were used to calculate the amount of electricity required to provide potable water. GHG emissions associated with potable water supply were then calculated using statewide electricity intensity factors.

Wastewater

The wastewater sector includes emissions resulting from wastewater treatment processes and from energy used to power wastewater treatment plants. City staff provided the total amount of wastewater sent to the Fairfield-Suisun Wastewater Treatment Plant from land uses within the city, as well as specific wastewater treatment factors, such as nitrogen content of effluent.

The 2006 International Panel on Climate Change (IPCC) *Guidelines for National Greenhouse Gas Inventories* was used to quantify CH₄ and nitrous oxide (N₂O) emissions resulting from wastewater treatment processes. Generation of both types of emissions depend on the amount of annual throughput (i.e., volume of wastewater), as well as characteristics of the wastewater itself and treatment plant management processes. Energy-related GHG emissions associated with wastewater treatment facility operation were removed from this sector to avoid double counting with the energy sector.

UNITS OF MEASUREMENT

Emissions inventories are commonly expressed in metric tons (or tonnes) of carbon dioxide equivalent per year (MT CO₂e/yr) to provide a standard measurement that incorporates the varying global warming potentials (GWP) of different greenhouse gases. GWP describes how much heat a greenhouse gas can trap in the atmosphere relative to carbon dioxide, which has a GWP of 1. For example, methane has a GWP of 25, which means that 1 metric ton of methane will trap 25 times more heat than 1 metric ton of carbon dioxide, making it a more potent greenhouse gas. Some gases used in industrial applications can have a GWP thousands of times larger than that of CO₂. See Table 2.1 for a sample of common greenhouse gases and their global warming potential.

**Table 2.1
Greenhouse Gases and Global Warming Potential**

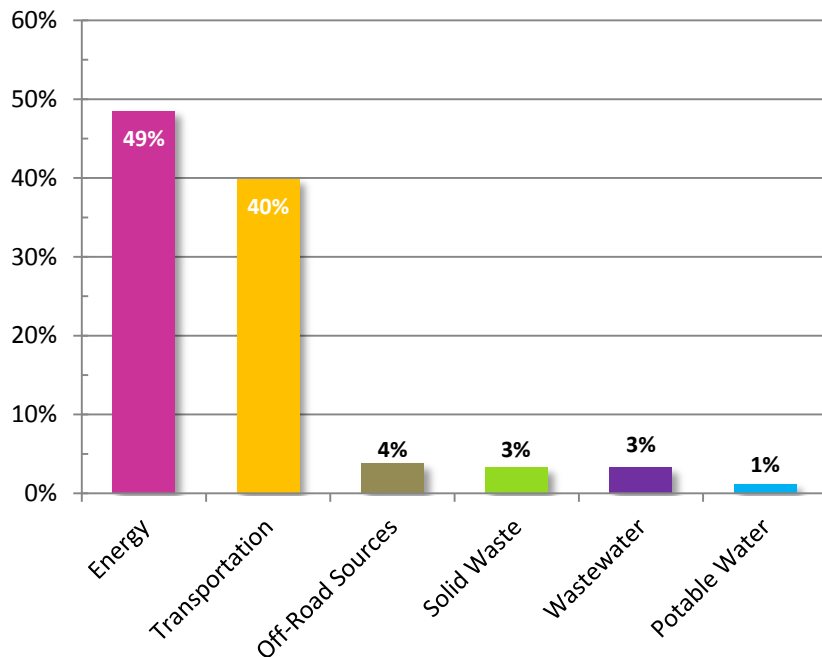
Common Name	Chemical Formula	Global Warming Potential (100-yr)
Carbon Dioxide	CO ₂	1
Methane	CH ₄	25
Nitrous Oxide	N ₂ O	298
Tetrafluoromethane (PFC-14)	CF ₄	7,390
Fluoroform (HFC-23)	CHF ₃	14,800
Sulfur Hexafluoride	SF ₆	22,800

Source: IPCC Fourth Assessment Report, Climate Change 2007ⁱ

BASELINE INVENTORY

Fairfield’s baseline emissions inventory totals 658,999 MT CO₂e/yr in 2005. As shown in Figure 2.1, energy use is the largest contributor of GHG emissions in the city (49%), with transportation emissions contributing the majority of the remainder (40%). The energy and transportation sectors account for approximately 89% of total emissions, suggesting that local reduction efforts should focus on these areas. Off-road sources provide 4% of the inventory, while solid waste and wastewater emissions provide another 3% each. Potable water use is a small contributor by comparison, making up the remaining 1% of the inventory. See Table 2.2 for the total emissions from each sector.

Figure 2.1 – 2005 Baseline Emissions by Sector



**Table 2.2
2005 Communitywide Emissions**

Emission Sector	Subsector	Emissions (MT CO₂e/year)	Communitywide Total (%)
Energy		319,664	48.5%
<i>Electricity Subtotal</i>		<i>126,984</i>	<i>19.3%</i>
	Residential	53,190	8.1%
	Commercial	70,016	10.6%
	Industrial	3,779	0.5%
<i>Natural Gas Subtotal</i>		<i>192,680</i>	<i>29.2%</i>
	Residential	81,405	12.4%
	Commercial	107,674	16.3%
	Industrial	3,601	0.5%
Transportation		262,657	39.9%
	Passenger Vehicles	222,507	33.8%
	Commercial Vehicles	40,150	6.1%
Off-Road Sources		25,256	3.8%
Solid Waste		22,066	3.3%
Wastewater	Wastewater Treatment	21,436	3.3%
Potable Water	Water Demand	7,920	1.2%
Total		658,999	100.0%

Source: AECOM 2013

Note: Columns may not total 100% due to rounding

EMISSIONS FORECASTS – 2020 AND 2035

The baseline inventory was used to project the future communitywide GHG emissions under a business-as-usual (BAU) scenario. Fairfield’s GHG emissions were forecast for the years 2020 and 2035, assuming that historic trends describing energy and water consumption, travel, and solid waste generation will remain the same in the future. Therefore, emissions forecasts demonstrate what emissions levels are likely to be under a scenario in which no statewide or local actions are taken to curtail emissions growth.

BAU emission forecasts provide insight regarding the scale of reductions necessary to achieve an emissions target before considering reductions likely to result from federal and statewide actions (e.g., vehicle efficiency standards), inherent technological advancements (e.g., energy-efficient appliances, lighting technology), or new voluntary or mandatory conservation efforts (e.g., landscape irrigation restrictions). The BAU emission forecasts also do not anticipate new sources of emissions or increased consumption rates in existing sectors. For example, as use of personal electronics, such as smartphones and tablets, increases emissions from electricity plug-load may also increase. Therefore, the only variable influencing the BAU forecasts is projected population and employment growth within the city.

The BAU forecasts use population and employment growth assumptions established by ABAG in support of Plan Bay Area. For the transportation sector, MTC provided future VMT activity levels using assumptions consistent with the VMT obtained for the baseline

year. The 2020 forecast year aligns with the AB 32 target year, while the 2035 forecast year aligns with the SB 375 planning horizon.

These forecasts have been developed for planning purposes, and due to the complexity of each emissions sector and the uncertainty of future population and employment growth within the city, are subject to change. As part of the regional approach in preparing this CAP, the participating cities chose to use the ABAG growth projections to have a common source of growth estimates in all of the plans. It should be noted that these growth estimates only represent a best guess scenario for future population and employment levels, and it is impossible to fully forecast the long-term impacts of the recent economic recession. Therefore, as the 2020 and 2035 horizon years approach, the city will reevaluate its emissions projections to incorporate additional data points from periodic emissions inventories and revised city growth estimates. Regular emissions inventory updates will also help to assess progress towards the reduction targets, allowing the city to make revisions to CAP measures as necessary.

Table 2.3 shows Fairfield’s communitywide emission forecasts by sector for 2020 and 2035. Communitywide emissions are forecast to increase by approximately 65,913 MT CO₂e/yr (10.0%) between 2005 and 2020, and by approximately 133,448 MT CO₂e/yr (20.3%) between 2005 and 2035. See Appendix A for details regarding the emissions forecast methodology.

Table 2.3 Communitywide Emissions 2005-2035					
Emission Sector	2005 Emissions (MT CO ₂ e/yr)	2020 Emissions (MT CO ₂ e/yr)	Increase from 2005 (%)	2035 Emissions (MT CO ₂ e/yr)	Increase from 2005 (%)
Energy	319,664	349,188	9.2%	378,711	18.5%
<i>Electricity Subtotal</i>	<i>126,984</i>	<i>138,712</i>	<i>9.2%</i>	<i>150,440</i>	<i>18.5%</i>
Residential	53,190	58,102	9.2%	63,015	18.5%
Commercial	70,016	76,482	9.2%	82,949	18.5%
Industrial	3,779	4,128	9.2%	4,477	18.5%
<i>Natural Gas Subtotal</i>	<i>192,680</i>	<i>210,475</i>	<i>9.2%</i>	<i>228,271</i>	<i>18.5%</i>
Residential	81,405	88,923	9.2%	96,442	18.5%
Commercial	107,674	117,619	9.2%	127,563	18.5%
Industrial	3,601	3,933	9.2%	4,266	18.5%
Transportation	262,657	289,900	10.4%	319,303	21.6%
Passenger Vehicles	222,507	243,399	9.4%	267,816	20.4%
Commercial Vehicles	40,150	46,501	15.8%	51,487	28.2%
Solid Waste	25,256	26,168	18.6%	29,733	34.7%
Off-Road Sources	22,066	27,589	9.2%	29,921	18.5%
Wastewater	21,436	23,416	9.2%	25,396	18.5%
Potable Water	7,920	8,652	9.2%	9,383	18.5%
Total	658,999	724,912	10.0%	792,447	20.3%

Source: AECOM 2013

Note: Columns may not total 100% due to rounding

Impact of Statewide Actions

Most of Fairfield’s anticipated emission reductions will come from statewide actions intended to help the state achieve its long-term emissions reduction goals. These actions are being applied throughout California, such as the state’s building energy efficiency standards, and their local impact can be quantified to estimate Fairfield’s share of these reductions. This CAP assumes that local emissions within the energy and transportation sectors will be reduced through the statewide efforts described in Chapter 1. This includes regulations addressing the use of renewable energy sources, energy efficiency, and GHG emissions from passenger cars and trucks. When the impact of these statewide actions is applied to Fairfield’s BAU emission forecast, the resulting adjusted business-as-usual (ABAU) emissions levels begin to show progress towards future reduction targets.

This CAP also considers PG&E’s future mix of electricity generation sources as planned through 2020, though this is not specifically a statewide action. In addition to its compliance with the state’s Renewable Portfolio Standard (RPS), PG&E also anticipates that the non-RPS compliant portion of its portfolio will become cleaner as their use of natural gas increases and that of coal decreases. Natural gas releases less CO₂ than coal when burned, which will result in a de-carbonization of PG&E’s electricity generation portfolio as this shift is implemented.

As part of future CAP updates, the city will monitor the effectiveness of state legislation to ensure that the anticipated level of reductions is achieved locally, and to ensure that all applicable statewide reductions are included.

The CAP includes locally-realized emissions reductions from:

- + SB 1078 (Renewable Portfolio Standard) + PG&E’s de-carbonization estimates
- + AB 1109 (Lighting Efficiency)
- + California Title-24 Building Energy Efficiency Standards
- + AB 1493 (Pavley I and II)
- + EO-S-1-07 (Low Carbon Fuel Standard)
- + Vehicle Efficiency Regulations

Including only these statewide initiatives towards the GHG reduction targets is considered a conservative approach because ARB’s Scoping Plan describes numerous other actions that will result in statewide emissions reductions. The actions included herein represent those for which a methodology is available to calculate Fairfield’s likely share of these reductions. Other actions will provide statewide benefits, but cannot be accurately attributed to Fairfield at this time, and have therefore been omitted from the CAP’s calculation of statewide actions.

Table 2.4 summarizes the anticipated reductions associated with these statewide actions in years 2020 and 2035. Figure 2.2 shows the trajectory of the BAU and ABAU emissions forecasts from baseline year 2005.

Table 2.4
2020 and 2035 Emission Reductions from Statewide Actions

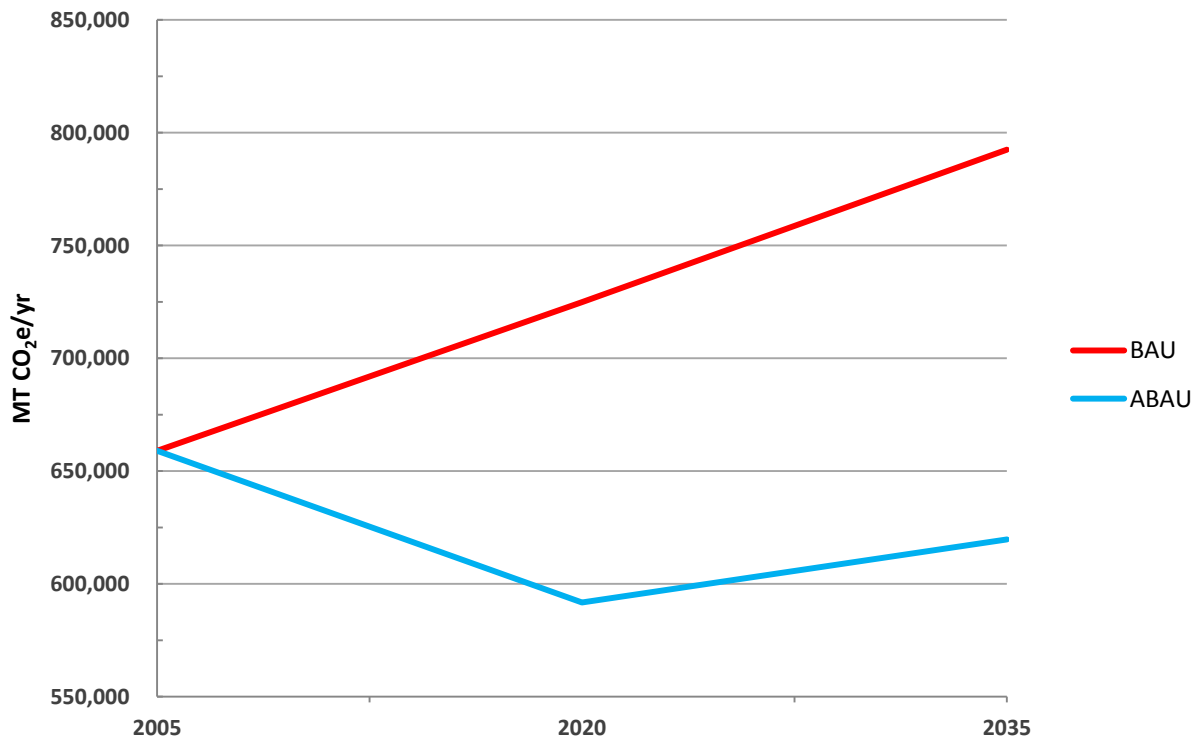
State or Federal Action	2020 Reduction (MT CO ₂ e/year)	2035 Reduction (MT CO ₂ e/year)
Renewable Portfolio Standard (33% by 2020) + PG&E De-carbonization	56,955	61,771
AB 1109 Lighting Efficiency	6,171	6,171
2013 California Building Energy Efficiency Standards	493	- ¹
Zero Net Energy Buildings Goal	- ²	5,112
Pavley I and II	49,537	80,402
Low Carbon Fuel Standard	18,844	18,083
Vehicle Efficiency Regulations	1,118	1,232
Total	133,118	172,771

Source: AECOM 2013

¹ Reductions from 2013 Building Energy Efficiency Standards are replaced in 2035 with the CEC’s Zero Net Energy Buildings Goal to avoid double counting emissions reductions with overlapping statewide actions;

² The CEC’s Zero Net Energy Buildings Goal is intended to take effect beginning in 2020 for residential buildings and 2030 for nonresidential buildings.

Figure 2.2 – Business as Usual (BAU) and Adjusted Business as Usual (ABAU) Emissions



Emission Reduction Targets

The purpose of a reduction target is to enable the city to achieve future GHG emissions reductions in a manner that supports statewide efforts, and complies with recent revisions to the California Environmental Quality Act (CEQA) guidelines to allow CEQA streamlining benefits. See Appendix B for a further description of the target setting rationale presented here.

MASS EMISSIONS AND EFFICIENCY THRESHOLDS

Targets can be expressed as either mass emissions reductions or efficiency thresholds. Mass emissions targets establish an absolute emissions level to be achieved by a target year, such as 100,000 MT CO₂e/yr by 2020. Typically, mass emissions targets are expressed as a percent below the emissions level of some baseline year, such as 15% below 2005 by 2020. Alternatively, efficiency thresholds set a target level of emissions per population or per service population (i.e., population plus local jobs), such as 6.6 MT CO₂e/SP/yr. Efficiency thresholds demonstrate a city's ability to grow population and employment, while emissions shrink on a per unit basis; in effect, a city could be growing more efficiently from an emissions standpoint. In this case, total emissions within a city may increase while still achieving an efficiency target, as long as service population is growing faster than emissions. Both types of targets are useful to consider when selecting an appropriate emissions reduction target for a community.

It is anticipated that the Governor's Office of Planning and Research will provide future guidance regarding preparation of plans for the reduction of GHG emissions. This guidance may identify mass emissions reduction targets as preferable to the use of efficiency metrics at the communitywide planning level, in order to ensure that each jurisdiction in California makes progress towards actual mass emissions reductions. However, at the time of this CAP's preparation there was no state-level guidance requiring local governments to adopt specific reduction targets.

TARGET SETTING CONSIDERATIONS

The city considered a range of GHG emission reduction targets during plan preparation. In making its target selection, the city weighed numerous factors, such as:

- + existing California climate change legislation, direction from ARB, and guidance from California air districts;
- + general understanding of the probable range of GHG reduction opportunities from various types of local and statewide measures;
- + the range of targets and goals set by other Solano County jurisdictions who have completed CAPs; and
- + the feasibility of achieving different GHG targets.

State Legislation and Guidance

The underlying purpose of AB 32 is to take state action that will result in an **absolute reduction** in the atmospheric level of carbon dioxide and other greenhouse gases, which contribute to the impacts commonly associated with climate change. Therefore, the state has set mass emissions reduction targets at the statewide level.

In 2005, Executive Order S-3-05 identified California’s vulnerability to the impacts of GHG emissions. The Executive Order established a long-range GHG reduction target of 80% below 1990 levels by 2050. Subsequently, AB 32, the California Global Warming Solutions Act of 2006 was signed, requiring California to reduce *statewide* GHG emissions to 1990 levels by 2020.

AB 32 also directed ARB to develop and implement regulations that reduce statewide GHG emissions. ARB approved *The Climate Change Scoping Plan* (Scoping Plan) in December 2008, which outlines the state’s plan to achieve the GHG reductions required in AB 32. The Scoping Plan does not define the specific role local governments, like the City of Fairfield, will play in meeting the state’s GHG reduction goals, but does identify cities and counties as “essential partners” within the overall statewide effort.

However, many local governments do not have sufficient historical data available to prepare a 1990 baseline emissions inventory, which would allow local governments to establish reduction targets that exactly mimic the state’s own targets. In the 2008 Scoping Plan, ARB “encourages local governments to adopt a reduction goal for municipal operations emissions and move toward establishing similar goals for community emissions that parallel the state commitment to reduce greenhouse gas emissions by approximately 15 percent from current levels by 2020.”ⁱⁱ

Based on this language, many communitywide CAPs select a reduction target of 15% below baseline levels by 2020 to parallel the state’s target. Some CAPs also establish a longer-term target to show the city’s trajectory towards the state’s 2050 goal of 80% below 1990 levels.

California Environmental Quality Act

The City of Fairfield intends to proactively use the tiering benefits provided under CEQA for communities that have adopted a “... local plan for the reduction or mitigation of GHG emissions” pursuant to SB 97 and State CEQA Guidelines Section 15183.5. If the CAP is prepared in a manner that meets the framework set forth in the CEQA Guidelines, the city can tier from the CAP’s CEQA document for the cumulative GHG emissions analysis of future development projects that are consistent with the CAP, eliminating the need for project-specific GHG analysis and mitigation measures.

State CEQA Guidelines Section 15183.5 establishes criteria that a GHG reduction plan, such as Fairfield’s CAP, should meet in order to provide for streamlining of future development projects consistent with the plan. In general, such plans should:

- + Quantify GHG emissions within a defined area,
- + Establish a level where GHG emissions are not cumulatively considerable,
- + Identify emissions from activities covered by the plan,
- + Specify measures to achieve the emissions reduction goal,
- + Monitor progress and amend if necessary, and
- + Be adopted in a public process following environmental review.

Section 15183.5(b)(1)(B) specifically requires that a GHG reduction target must “Establish a level, below which the contribution to [GHG] emissions from activities covered by the plan would not be cumulatively considerable.” To comply with this provision within the guidelines, a reduction target must be based on substantial evidence.

Air Quality Management District Guidance

Several air districts and state agencies (including the Bay Area Air Quality Management District (BAAQMD) and ARB) have established substantial evidence associated with recommended communitywide emissions reduction targets. Since two of the participating cities in this CAP effort are within the BAAQMD jurisdiction (including the City of Fairfield), and because YSAQMD has not established its own thresholds of significance for GHG emissions, the participating cities decided to consider BAAQMD's guidance when selecting their reduction targets.

As previously mentioned, the 2008 Scoping Plan presents substantial evidence recommending local agencies seek to reduce communitywide emissions by 15% below current emission levels by 2020. In 2010, BAAQMD also adopted CEQA Air Quality Guidelines that presented substantial evidence for three communitywide emissions reduction targets: 1) 1990 levels by 2020, 2) 15% below current (2008 or earlier) levels by 2020, or 3) use of an efficiency threshold of 6.6 MT CO₂e/yr per service population (i.e., residents plus employees) by 2020. This efficiency threshold is intended to be used only in the context of general or communitywide plans, not individual development projects.

However, BAAQMD's June 2010 adopted thresholds of significance were challenged in a lawsuit, and the Alameda County Superior Court issued a judgment finding in 2012 that the Air District had failed to comply with CEQA when it adopted the thresholds. The court found that the adoption of the thresholds was a project under CEQA and ordered the Air District to examine whether the thresholds would have a significant impact on the environment under CEQA before recommending their use. The court issued a writ of mandate ordering the Air District to set aside the thresholds and cease dissemination of them until the Air District had complied with CEQA. In view of the trial court's order, which remains in place pending final resolution of the case, the Air District is no longer recommending that the thresholds be used as a generally applicable measure of a project's significant air quality impacts.

However, the court did not determine whether the thresholds are or are not based on substantial evidence and thus valid on the merits. Therefore, cities could continue to rely on the substantial evidence based on statewide data and analysis relative to AB 32 that underlies the June 2010 BAAQMD thresholds when making an independent determination of significance of plan-level GHG impacts pursuant to State CEQA Guidelines Section 15064.7(c).

The logic behind BAAQMD's efficiency target is that if all California communities achieved the same level of efficiency on a "fair-share" per service population basis, then the state would achieve its AB 32 GHG reduction goal for 2020. The target metric was calculated by dividing total statewide land use-generated emissions in 2020 by the total population and jobs projected in the state in 2020, as shown in Table 2.5.

Building upon this logic, the project team further refined the efficiency threshold targets, and projected them towards the state's 2050 reduction target at ten-year intervals (with a 2035 target included for consistency with the SB 375 horizon year). Table 2.6 demonstrates the calculation of efficiency level thresholds that were considered as possible targets by the participating cities in development of their CAPs.

Table 2.5
Statewide Efficiency Level Threshold for 2020

	2020 Horizon Year
Population ¹	40,643,643
Employment ²	18,994,360
Service Population (SP) ³	59,638,003
Emissions Level Target ⁴	395,830,000 MT CO ₂ e/yr
Emissions per SP Target	6.6 MT CO₂e/SP/yr

Source: Adapted by AECOM, 2013

¹ Population from California Department of Finance 2013 Forecasts

² Employment is from EDD, extrapolated from 2018 estimates to 2020

³ Service Population = Population + Employment

⁴ Represents the 2020 horizon year target, which is a return to 1990 emission levels, as represented in the ARB California Greenhouse Gas Inventory for 1990. Includes only the Energy and Waste sectors from the 1990 inventory. The Industrial Processes and Product Use sector and Agriculture, Forestry, and Other Land Use sector were omitted because their emissions are not derived from urban development activities (e.g., residential construction, commercial development).

Table 2.6
Statewide Efficiency Threshold Targets through 2050

	2020	2030	2035	2040	2050
Population ¹	40,643,643	44,279,354	46,083,482	47,690,186	50,365,074
Total Employment ²	18,994,360	20,693,470	21,536,609	22,287,484	23,537,564
Total Employment minus Farm, Mining, Logging, Manufacturing ²	17,314,380	18,863,210	19,631,777	20,316,240	21,455,755
Total Service Population ³	59,638,003	64,972,824	67,620,091	69,977,670	73,902,638
Total Service Population minus Farm, Mining, Logging, Manufacturing	57,958,023	63,142,564	65,715,259	68,006,426	71,820,829
Emissions Level Target ⁴ (MT CO ₂ e/yr)	264,100,000	193,673,333	158,460,000	123,246,667	52,820,000
Emissions per Service Population (MT CO₂e/SP/yr)	4.6	3.1	2.4	1.8	0.7

Source: AECOM, 2013

¹ Population from California Department of Finance 2013 Forecasts

² Employment is from EDD, extrapolated from 2018 estimates to 2020. Then, extrapolated to 2035 based on population to land-use-related job ratio in 2020. Non-farm, mining, logging, manufacturing estimate for 2030 and beyond is based on 2020 ratio between total employment and non-land use employment.

³ Service Population = Population + Employment

⁴ Further revisions were made to emissions in the Energy and Waste sectors that were included in Table 2.5. In general, revisions were made to exclude industrial emissions across all sectors, national security emissions, and certain transportation-related emissions, such as aviation and water borne transportation. See Appendix B for further detail on the calculation of this revised 2020 emissions levels. The revised 2020 emissions level then represents a 1990 baseline, which is used to calculate the 2050 emissions level target (i.e., 80% below the 2020 level shown here). Emissions level targets for intermediary years were projected using linear growth calculations.

Local Government Targets in Solano County

The participating cities also considered the GHG emission reduction targets established in adopted or proposed CAPs prepared by other jurisdictions in Solano County, which include:

- + City of Benicia CAP – 10% below 2000 levels by 2020
- + City of Vacaville Draft CAP – 21.7% below 2020 BAU levels by 2020
- + City of Vallejo CAP – 15% below 2008 levels by 2020
- + Solano County CAP – 20% below 2005 levels by 2020

Although different targets and baseline years (or horizon year in the case of Vacaville) are used by each jurisdiction, each of these targets aims to be consistent with the statewide goals of AB 32, and with either the Scoping Plan or more recent ARB statewide projections consistent with the Scoping Plan. In other words, they all meet or exceed AB 32 requirements for 2020. Additionally, none of these jurisdictions have established targets for the 2035 timeframe.

TARGET OPTIONS CONSIDERED

As part of their collaborative CAP development effort, Fairfield and the other participating cities have chosen to establish 2020 and 2035 targets that meet the following criteria:

- + Are realistic and achievable
- + Consider impacts of statewide and local actions
- + Parallel statewide emissions reduction targets
- + Are based on substantial evidence to allow CEQA streamlining benefits

While adherence to these criteria has resulted in the selection of different targets among the participating cities, mass emissions targets were selected, when feasible, to demonstrate consistency with the state’s absolute emissions reduction efforts. However, as part of ABAG’s 2014-2022 regional housing needs allocation cycle, Fairfield and Suisun City both accepted a higher share of the Solano County subregional housing needs allocation than they otherwise might have been assigned compared to Dixon and Rio Vista. This resulted in higher emissions growth rates in Fairfield and Suisun City due to higher growth projections, making the achievement of a mass emissions target more difficult than for Dixon and Rio Vista. As described in the emissions forecast discussion above, the ABAG growth projections used in the emissions inventory may also be higher than what actually occurs, which also contributes to Fairfield’s inability to achieve a mass emissions reduction target.

Ultimately, targets were chosen to respond to the unique characteristics of each community while still demonstrating a significant local contribution to the state’s emissions reduction goals. The following sections describe the differences between the two possible target options, and illustrate why the city cannot achieve one, but can achieve the other.

Mass Emissions Target Option

Table 2.7 shows the reductions that would be required in Fairfield under a mass emissions target for 2020 and 2035. Table 2.7 also shows the reductions contributions

attributable to statewide actions, and the remaining emissions reduction gap that would need to be addressed by the local actions presented in Chapter 3. Figure 2.2 illustrates the same information with a red line showing the city’s emissions trajectory towards 2035 and a blue line representing ABAU emissions to show the impact of statewide actions. The gray line shows the necessary emissions trajectory to achieve a near-term 2020 target and a longer-term 2050 target, with a dashed line marking an interim 2035 target. The table and figure both show a gap between the mass emissions targets and the ABAU forecasts, indicating the role that local actions would play to achieve these targets.

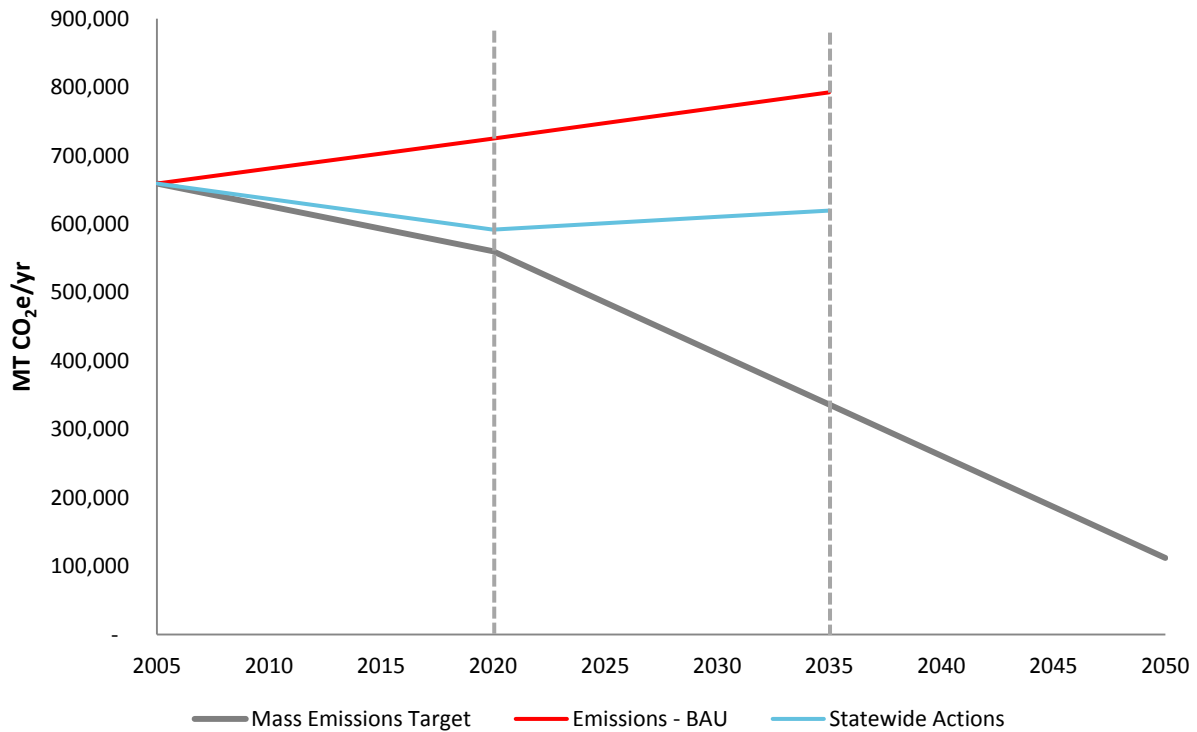
Please note that while the Air Resources Board has prepared quantified emissions reduction estimates for statewide actions through 2020 as part of the Scoping Plan process described in Chapter 1, they have not yet provided reduction estimates beyond that horizon year. It is likely that new statewide actions will be developed and existing ones enhanced to provide even greater emissions reduction opportunities for the 2035 horizon year than are estimated below. However, at the time of CAP preparation these 2020 and 2035 statewide emissions reduction estimates are based on information that is currently available.

As part of the CAP development process, the city’s proposed local actions (described in Chapter 3) were quantified to determine if a mass emissions target was realistic and achievable given its growth forecast. It was determined that, even with aggressive implementation estimates, the city would still struggle to achieve the remaining reductions of 31,645 MT CO₂e/yr that would be required to achieve a mass emissions target by 2020, as shown in Table 2.7. This is primarily because new growth in the city is estimated to occur at a faster pace than local reductions measures could accommodate. However, Fairfield’s ability to accommodate increased population and employment growth could support achievement of an efficiency threshold target, as described next.

Table 2.7 Fairfield Mass Emissions Reduction Targets			
	2005 (MT CO ₂ e/yr)	2020 (MT CO ₂ e/yr)	2035 (MT CO ₂ e/yr)
Inventory and BAU Projections	658,999	724,912	792,447
Reduction Target		560,149	336,089
Reductions Needed to Achieve Target		164,763	456,358
Assumed Statewide Reductions		133,118	172,771
Local Action Reductions Needed to Achieve Targets		31,645	283,587

Source: AECOM 2013

Figure 2.3 – Mass Emissions Reduction Target Option



Efficiency Threshold Target Option

Table 2.8 uses the statewide efficiency targets shown in Table 2.6 as the local emissions targets by applying Fairfield’s projected service population. As previously described, this type of target could allow mass emissions to increase, while still reducing per capita GHG emissions. Table 2.8 shows that under an efficiency threshold approach, the city’s 2020 target would be 4.6 MT CO₂e/SP/yr, while BAU emissions forecasts are only 4.2 MT CO₂e/SP/yr. Statewide actions would reduce the emissions forecasts even further. This indicates that no local actions would be required to achieve the 2020 target because the BAU emissions forecast levels (i.e., 4.2 MT CO₂e/SP/yr) are already lower than the emissions target level for 2020 (i.e., 4.6 MT CO₂e/SP/yr).

However, Figure 2.3 shows a steep trajectory toward a long-term 2050 efficiency threshold target (i.e., the gray line). Therefore, the city decided that in order to make progress on future emissions targets, it was important to develop local actions as part of this CAP. The measures developed in Chapter 3 establish a local framework for future emissions reduction activities, and leverage regional participation to find cost effective implementation opportunities, even though no local action is presently required to achieve the 2020 target as described in Table 2.8.

**Table 2.8
Fairfield Efficiency Threshold Reduction Targets**

	2005	2020	2035
Service Population (population + employment) ¹	157,640	172,199	186,759
Inventory and BAU Projections (MT CO ₂ e/yr)	658,999	724,912	792,447
BAU Efficiency Level (MT CO ₂ e/SP/yr) ²	4.2	4.2	4.2
Efficiency Level Target (MT CO ₂ e/SP/yr)	-	4.6	2.4
Efficiency Level Target (MT CO ₂ e/yr)		792,115	448,222
Reductions Needed to Achieve Target ³ (MT CO ₂ e/yr)		0	344,225
Assumed Statewide Reductions (MT CO ₂ e/yr)		133,118	172,771
Local Action Reductions Needed to Achieve Targets		0	171,454

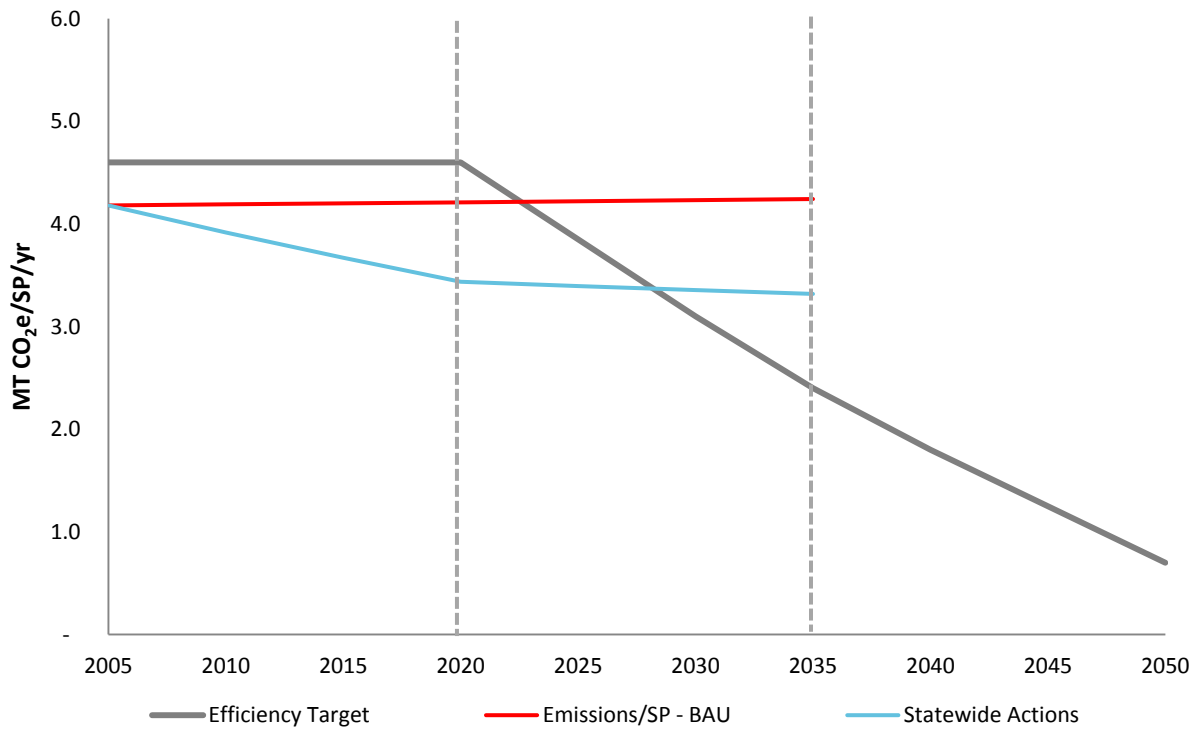
Source: AECOM 2013

¹ See Appendix A for population and employment sources and assumptions

² Per Table 2.6

³ 2020 efficiency level target is greater than 2020 forecast emissions, which means the city would achieve its 2020 target without statewide or local actions. In addition, the 2020 and 2035 forecast emissions assume that population and employment growth will meet ABAG's Plan Bay Area projections; this assumes residential development will return to historic levels and employment growth follows.

Figure 2.4 – Efficiency Target Option



FAIRFIELD'S EMISSIONS REDUCTION TARGETS

Based on the estimated growth projected in the city through 2035 and each of the target setting considerations described above, Fairfield has selected the following efficiency threshold reduction targets for 2020 and 2035:

- + **2020:** 4.6 MT CO₂e/SP/yr
- + **2035:** 2.4 MT CO₂e/SP/yr

These targets allow the city to demonstrate contributions toward statewide absolute emissions reductions, while accommodating regional population and employment growth. The targets also provide opportunities for future CEQA streamlining benefits based on the substantial evidence supporting these metrics found in the Scoping Plan and BAAQMD's June 2010 thresholds of significance. These targets are consistent with those selected by the other participating cities (in that they show a trajectory towards long-term reduction targets), which further supports the regional collaboration established during plan development. The 2020 target is directly related to the previously described guidance from ARB and BAAQMD, whereas the 2035 target represents consistency with a linear trajectory towards the state's long-term target of 80% below 1990 levels by 2050.

2020 Emissions Reduction Target

Based on the 2005 emissions inventory and 2020 forecasts presented in this chapter, the 2020 communitywide emissions reduction target is 792,115 MT CO₂e/yr (i.e., 4.6 MT CO₂e/SP/yr). No statewide or local reductions would be required in 2020 to achieve this target, based on the service population growth estimates used to develop the emissions forecasts. However, the 2020 statewide reductions identified in Table 2.4 would still contribute emissions reductions totaling 133,118 MT CO₂e/yr.

2035 Emissions Reduction Target

Achieving the 2035 communitywide emissions reduction target of 448,222 MT CO₂e/yr (i.e., 2.4 MT CO₂e/SP/yr) would require reductions totaling 344,225 MT CO₂e/yr. Statewide reductions identified in Table 2.4 would contribute 172,771 MT CO₂e/yr, leaving a reductions gap of 171,454 MT CO₂e/yr to be addressed through local actions and additional or enhanced statewide actions.

Notes

ⁱ International Panel on Climate Change. *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007*. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.). [Cambridge University Press](#), Cambridge, United Kingdom and New York, NY, USA. Available at: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html.

ⁱⁱ California Air Resources Board. *Climate Change Scoping Plan: a Framework for Change*. December 2008. Available at: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf.

CHAPTER 3

EMISSIONS REDUCTION MEASURES

3

This chapter describes measures and actions that would be needed to reduce communitywide greenhouse gas (GHG) emissions, and achieve the city's 2020 and 2035 reduction targets. Most measures are designed to achieve quantifiable GHG reductions, while others are listed as supporting measures because they cannot be accurately quantified. To ensure proper implementation, each measure is accompanied by a description providing policy background and implementation details that articulate necessary actions; city departments with primary action responsibility; and progress indicator timelines to track implementation. The city will evaluate effectiveness of CAP measures and actions every three years and propose program modifications if necessary to achieve reduction targets.

Summary of Reductions

Table 3.1 summarizes GHG emission reductions anticipated from implementation of the measures and actions presented in this chapter and the statewide reductions described in Chapter 2. These measures, as well as unquantified supporting measures, are described in detail throughout this chapter to describe how each contributes to emissions reductions and how they will be implemented in Fairfield. A target achievement discussion is presented at the end of this chapter to show how the city can achieve its 2020 reduction target, and what steps should be taken to put the city on a path towards achievement of longer-term emissions reduction targets.

Table 3.1 Measures and Quantified Reductions			
CROSS-CUTTING STRATEGIES		2020 (MT CO₂e/yr)	2035 (MT CO₂e/yr)
CC-1.1	Sustainability Coordinator		Supporting Measure
CC-1.2	Public Outreach		Supporting Measure
ENERGY STRATEGY		2020 (MT CO₂e/yr)	2035 (MT CO₂e/yr)
E-1. Existing Buildings			
E-1.1	Energy Efficiency Retrofit Outreach	1,119	3,363
E-1.2	Energy Efficiency Assessments		Supporting Measure
E-2. New Construction			
E-2.1	New Construction Energy Efficiency	73	- ¹
E-2.2	Solar Ready Construction		Supporting Measure
E-3. Financing			
E-3.1	Energy Efficiency Rebate Program		Supporting Measure
E-3.2	PACE Financing Program		Supporting Measure
E-4. Building Appliances			
E-4.1	ENERGY STAR Appliances	228	518
E-4.2	Smart Grid	1,328	2,359
E-4.3	Permanent Load Shift		Supporting Measure
E-5. Building Cooling			
E-5.1	Building Shade Trees	245	501
E-5.2	Parking Lot Shade Trees		Supporting Measure
E-6. Building Lighting			
E-6.1	Indoor Lighting Efficiency		Supporting Measure

E-7. Renewable Energy

E-7.1	Solar Photovoltaic Systems	4,534	6,668
E-7.2	Solar Water Heaters	295	1,660
E-7.3	District Energy Systems	Supporting Measure	
E-7.4	Community Choice Aggregation	0	- ²

E-8. Street and Area Lighting

E-8.1	Street Light Upgrade	352	352
E-8.2	Traffic Light Upgrade	32	32
E-8.3	Parking Lot Lighting Upgrade	74	202

E-9. Municipal Actions

E-9.1	Municipal Renewable Energy Development	0	453
E-9.2	Municipal Building Energy Efficiency	483	558
E-9.3	Wastewater Treatment Plant Process Energy Optimization	171	171

Subtotal Energy		8,934	16,836
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TRANSPORTATION AND LAND USE STRATEGY	2020	2035
	(MT CO₂e/yr)	(MT CO₂e/yr)

T-1. Pedestrians + Bicycles

T-1.1	Pedestrian Environment Enhancements	Supporting Measure	
T-1.2	Bicycle Infrastructure	Supporting Measure	
T-1.3	Bicycle Outreach Program	Supporting Measure	

T-2. Public Transit

T-2.1	Transit-Route Stabilization	Supporting Measure	
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T-3. Land Use

T-3.1	Transit-Oriented Development	0	1,738
T-3.2	Mixed-Use Development	Supporting Measure	

T-4. Alternative Fuels

T-4.1	Alternative Fuel Vehicles	3,330	- ²
T-4.2	Municipal Alternative Fuel Vehicles	Supporting Measure	

T-5. Transportation Demand Management

T-5.1	Transportation Demand Management	1,367	2,242
T-5.2	Intelligent Transportation System	1,313	1,313

Subtotal Transportation and Land Use		6,010	5,293
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WATER STRATEGY	2020	2035
	(MT CO₂e/yr)	(MT CO₂e/yr)

W-1.1	SB X7-7	2,230	2,722
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Subtotal Water		2,230	2,722
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SOLID WASTE STRATEGY		2020	2035
		(MT CO₂e/yr)	(MT CO₂e/yr)
SW-1. Waste Reduction			
SW-1.1	Landfill Diversion		Supporting Measure
SW-1.2	Commercial Recycling Program		Supporting Measure
SW-1.e3	Source Reduction Program		Supporting Measure
SW-2. Organic Waste			
SW-2.1	Residential Food Scrap Diversion	47	1,484
SW-2.2	Commercial Food Scrap Collection	59	813
SW-2.3	Yard Waste Diversion	314	1,016
SW-2.4	Construction and Demolition Waste	435	2,111
Subtotal Solid Waste		855	5,424
GREEN INFRASTRUCTURE STRATEGY		2020	2035
		(MT CO₂e/yr)	(MT CO₂e/yr)
GI-1.1	Urban Forest Program	1,275	2,527
Subtotal Green Infrastructure		1,275	2,527
SUBTOTAL CAP MEASURES		19,304	32,802
STATEWIDE REDUCTIONS		2020	2035
		(MT CO₂e/yr)	(MT CO₂e/yr)
Renewable Portfolio Standard + PG&E De-Carbonization		56,955	61,771
AB 1109 – Lighting Efficiency Program		6,171	6,171
2013 California Building Energy Efficiency Standards		493	- ³
Zero Net Energy Buildings Goal		- ⁴	5,112
Pavley I and II		49,537	80,402
Low Carbon Fuel Standard		18,844	18,083
Vehicle Efficiency Regulations		1,118	1,232
Subtotal		133,118	172,771
Target Reductions Needed		0⁵	344,225
TOTAL REDUCTIONS ESTIMATED		152,422	205,573

Note: Subtotals and totals may not appear to add correctly due to rounding.

¹ Included in 2035 statewide calculation for zero net energy building goal;

² See *Progress toward 2035 Target* discussion at end of chapter for additional detail;

³ Reductions from 2013 Building Energy Efficiency Standards are replaced in 2035 with the CEC’s Zero Net Energy Buildings Goal to avoid double counting emissions reductions with overlapping statewide actions;

⁴ The CEC’s Zero Net Energy Buildings Goal is intended to take effect beginning in 2020 for residential buildings and 2030 for nonresidential buildings.

⁵ City achieves service population-based efficiency threshold in 2020 without additional local actions; see Chapter 2 for target-setting discussion

Measure Structure

This chapter is organized according to six strategy areas: cross-cutting strategies, energy, transportation, water, solid waste, and green infrastructure. These strategies represent the primary avenues by which to reduce communitywide GHG emissions in Fairfield. Each strategy area section begins with an introduction to the overarching concepts that tie that particular strategy to GHG emission generation and potential reductions. The strategy overview is followed by the specific measures and actions that translate the city's vision into on-the-ground implementation.

REDUCTION MEASURES

Measures define the programs, policies, and projects that the city will undertake to accomplish its GHG emission reduction goals. Each measure includes information related to GHG reduction potential, opportunities for regional implementation, sustainability co-benefits, and relative magnitude of cost.

REDUCTION POTENTIAL

The estimated annual emissions reduction potential of each quantifiable measure is provided for 2020 and 2035 in MT CO₂e/yr. Some measures have the same reduction potential for both horizon years because the underlying participation assumptions are held constant. Measures identified as "Supporting Measures" contribute to GHG reductions and are an important component of this CAP, but currently lack a methodology to quantify their emissions reduction potential. For example, the proposed sustainability coordinator position described in Measure CC-1.1 is critical to the full implementation of other CAP measures, but it is not possible to accurately calculate the emissions reductions specifically related to that new staff position. Appendix B describes the methodology used to quantify emissions reductions.

ICONS

Graphic icons are used in this chapter to indicate measures that have regional implementation opportunities, sustainability co-benefits associated with the measures, and simple cost estimates for mandatory components of measures. Figure 3.1 presents the icons found throughout this measure.

Regional Efforts

Measures that would benefit from a regional implementation strategy are denoted as Regional Efforts. The four participating cities (i.e., Dixon, Fairfield, Rio Vista, and Suisun City) could collaborate on implementing these measures to reduce overhead costs associated with new program development, or could partner with other regional agencies to create a sustainability coordinator position to oversee CAP implementation.

Co-Benefits

As described in Chapter 1, implementation of these measures will provide additional community benefits beyond their GHG reductions. The icons listed with each measure represent only a sample of the numerous co-benefits related to individual measures.

Cost Analysis

Some CAP measures require residents and local businesses to take action or direct the city government to develop and implement additional programs. Simple cost estimates (i.e., Very Low, Low, Medium, High) for these mandatory actions are provided for informational purposes to help weigh the potential costs and benefits of certain measures. Cost analysis was not performed for measures that describe current and on-going city programs and actions, or voluntary measures that rely on residents and businesses to make personal decisions regarding the importance and value of certain actions. Appendix C provides assumptions used to calculate these simple cost estimates.

Figure 3.1 – CAP Measure Co-Benefits



MEASURE BACKGROUND

The measure background section provides information about the specifics of a measure, including descriptions of various technologies or financing mechanisms. This section also provides information on currently available rebates and other financial incentives related to the measure, and describes any actions the city has taken to date towards implementation of that measure. Additionally, some descriptions provide guidance that will be used in program implementation, such as components of the outreach plan and which segments of the community should be targeted for inclusion.

ACTIONS AND PROGRESS INDICATORS

Action steps and progress indicators are provided in a table following each measure description. Actions identify specific steps that the city will take to implement the measure. The table also identifies responsible departments or agencies that would be best positioned to lead or provide input for implementation of certain tasks. Measures that could be implemented by a regional Sustainability Coordinator, as described in Measure CC-1.1, are identified should the participating cities secure funding for such a position. In most cases, an alternative responsible department is also listed in the event that a sustainability coordinator position cannot be established.

Progress indicators describe the specific action that is being quantified to estimate the reduction potential. These indicators enable city staff, the City Council, and the public to track implementation and monitor overall CAP progress. Progress indicators are provided for both 2020 and 2035, where applicable, and are specifically described when possible with quantified metrics, such as square feet (sq ft) renovated, number of solar hot water heaters installed, or number of employees participating in commute reduction programs. Progress indicators are not provided for supporting measures, which do not have quantifiable emissions reductions.

Reduction Strategies

The strategies identified in this Chapter affect issues within the city's direct influence. Each strategy is subdivided into various sub-strategy headings to help organize the reduction measures. Measures were developed by (a) evaluating existing community conditions, (b) identifying emission reduction opportunities within the community, (c) reviewing best practices from other jurisdictions and organizations, and (d) incorporating State and regional laws, guidelines, and recommendations. Fairfield's measures were also developed as part of a regional conversation between the cities of Dixon, Rio Vista, and Suisun City to provide as much consistency between the four cities CAPs as possible. The adopted CAPs for Solano County and the Cities of Benicia and Vallejo were also reviewed as part of the measure development process to lay the foundation for regional implementation efforts.

The emission reduction strategies are as follows:

- + **Cross-Cutting:** The Cross-Cutting Strategy describes overarching opportunities for regional implementation, but does not include estimates for direct emissions reductions.

- + **Energy:** The Energy Strategy recommends ways to increase energy efficiency in existing buildings, enhance energy performance for new construction, and increase use of renewable energy.
- + **Transportation:** The Transportation Strategy encourages transit, carpooling, walking, and bicycling as viable transportation modes to decrease the need to drive.
- + **Water:** The Water Strategy promotes the efficient use and conservation of water in buildings and landscapes.
- + **Waste:** The Waste Strategy increases waste diversion and recycling, reducing consumption of materials that otherwise end up in landfills.
- + **Green Infrastructure:** The Green Infrastructure strategy suggests ways to enhance the existing urban forest.

Cross-Cutting Strategies

During CAP development, the participating cities identified a need for regional support in the CAP implementation process. Numerous measures were designed to be implemented through collaboration to leverage limited resources and convey a consistent message throughout the county. The following two measures represent this overarching strategy of regional collaboration.

Measure CC-1.1: Sustainability Coordinator

Supporting Measure – Not Quantified

Establish a full-time regional sustainability coordinator to monitor CAP implementation and promote regional sustainability efforts. Explore opportunities to partner with other Solano County governments on this effort (e.g., City of Benicia, Solano County).



Measure Background

Implementation of the following measures described in this CAP will likely require an effort that surpasses the available capacity of existing city staff. Further, numerous measures are identified as “Regional Opportunities” that would benefit from collaboration among the different Solano County governments. Therefore, the participating cities recommended the creation of a regional sustainability coordinator position, which could oversee implementation of CAP measures that rely on regional collaboration.

The sustainability coordinator would act as a liaison between local governments, residents, and businesses in Solano County to implement and track progress of CAP

measures and actions. A regional approach would provide implementation efficiencies on certain measures, and would also help to disseminate best practices information to the local governments regarding other measures. The sustainability coordinator could also act as the point of contact for various regional agencies, including STA, PG&E, the Solano EDC, and the Solano Center for Business Innovation. This would allow one person to gain experience in facilitating implementation of the various programs described throughout this CAP, as opposed to multiple employees of each local government having to coordinate their efforts.

In recent years, several city and county governments have been able to sponsor a full-time sustainability coordinator position through American Reinvestment and Recovery Act (ARRA) grant funding or similar programs. The city will collaborate with other local governments to identify and pursue grant funding to establish a regional sustainability coordinator position.

Action	Responsibility
A Secure funding for regional Sustainability Coordinator position.	STA; Community Development; Solano EDC
B Coordinate with other Solano cities and the County to prioritize regional sustainability issues and programs for joint implementation.	Community Development; Solano EDC

Measure CC-1.2: Public Outreach
 Supporting Measure – Not Quantified

Develop coordinated outreach campaign to fulfill the public outreach components recommended throughout this CAP.



Measure Background

Community engagement and effective participation are essential to the successful implementation of this CAP. During the CAP implementation period, the city will conduct outreach programs that involve residents and businesses in various activities, assessments, and actions.

Effective public participation will increase the likelihood that the measures recommended in this plan achieve estimated participation rates. Furthermore, Fairfield will see higher participation rates if outreach and education programs are adapted over time to meet the changing needs of the community. Increased participation rates will result in increased emissions reductions.

At the start of each fiscal year, the city will work with local stakeholders to determine the outreach priorities of the community, which could be a certain segment of the community (e.g., a group of neighborhoods, the agricultural community, the retail sector) or a specific action (e.g., carpooling, biking, lighting). Outreach priorities should

be related to measures described in the CAP. The city will strive to designate at least one outreach event per quarter to address the chosen priority areas. The city could also designate one week per year to conduct a high-profile outreach campaign targeting a specific measure or strategy area. The campaign week could also be used to recognize community members or businesses that have implemented major improvements.

Numerous measures described in this chapter would benefit from a website that could serve as a central source of information on resource conservation strategies, technical assistance for a variety of topics, and a clearinghouse for rebates and other financial incentives to help implement CAP strategies. The city will work with the Sustainability Coordinator and other local governments to develop a Solano County Sustainability Website that will be a resource for all residents and businesses in the county.

Action	Responsibility
A Work with local stakeholders to determine the CAP outreach priorities for the year.	Community Development; Sustainability Coordinator
B Designate at least one outreach event per quarter to address the priority areas.	Community Development; Sustainability Coordinator
C Conduct a high-profile energy efficiency outreach campaign; recognize community members that have implemented major improvements.	Sustainability Coordinator
D Partner with other Solano County governments to develop a county sustainability website.	Sustainability Coordinator

Energy Strategy

As described in Chapter 2, the consumption of electricity for appliances, lighting, and cooling, and combustion of natural gas for heating, cooking, and other processes within residential, commercial, and industrial buildings generated nearly one half of Fairfield's communitywide GHG emissions in 2005. These emissions can be reduced by improving energy efficiency in new and existing buildings and increasing the amount of electricity and heat generated from renewable energy sources.

In Fairfield, approximately 46%ⁱ of the housing stock was built before California's energy code, Title 24 Part 6, was first adopted in 1978. Consequently, the building stock offers considerable opportunity for cost-effective energy efficiency retrofits to decrease the use of both electricity and natural gas. The city plans to achieve building energy efficiency improvements in both existing and new buildings through a combination of community outreach and education, incentives, and regulations.

Pacific Gas and Electric Company (PG&E) is Fairfield's energy utility, providing both natural gas and electricity for residential, commercial, industrial, and municipal uses. PG&E provides electricity generated at hydroelectric, nuclear, renewable, natural gas, and coal facilities. As of 2011, natural gas facilities provided 25%; nuclear plants provided 22% of the total electricity supply; renewable energy facilities including solar, geothermal, and biomass provided 19%; large hydroelectric operations provided 18%; and unspecified sources provided the remainderⁱⁱ. Under the provisions of SB 107 (2006), investor-owned utilities were required to generate 20% of their retail electricity using qualified renewable energy technologies by the end of 2010. In compliance with this mandate, PG&E will expand its renewable generation portfolio, making additional GHG-free electricity available to customers in Fairfield. In 2011, PG&E delivered 19% of total electricity from eligible renewable sources.

The city will encourage communitywide installation of rooftop solar photovoltaic (PV) and solar hot water systems to increase the portion of Fairfield's energy portfolio provided from renewable sources. The city will also explore installation of renewable energy facilities on municipal property to increase the generation of renewable energy in the community.

The total GHG emission reduction potential of the Energy Strategy is 9,047 MT CO₂e/yr in 2020. This represents about 6% percent of total 2020 reductions.

E-1: Existing Buildings

Measure E-1.1: Energy Efficiency Retrofit Outreach

2020 GHG Reduction Potential: **1,119 MT CO₂e/yr**

2035 GHG Reduction Potential: **3,363 MT CO₂e/yr**

Encourage voluntary energy efficiency retrofits in residential and nonresidential buildings through promotion of local efforts.



Measure Background

Energy efficiency improvements to residential and nonresidential structures can reduce both energy bills and GHG emissions. Many residences (approximately 56 percentⁱⁱⁱ) in Fairfield are owner-occupied, and thus the financial savings of home energy efficiency retrofits are in the long term economic interest of the homeowner. As such, the city will emphasize voluntary participation in energy efficiency retrofit programs, in lieu of mandatory programs. As part of the outreach program, the city will enhance its website by linking to information on existing energy efficiency rebates and other financial incentives, including PG&E incentives to businesses for energy efficiency improvements. The website could also contain local case studies of businesses that have completed cost effective energy efficiency improvements.

To encourage participation from residential homeowners, the city will partner with the Solano Center for Business Innovation to use existing Energy Upgrade California educational materials and online platform that provides access to incentives, technical assistance, and qualified contractors. Typical rebates and incentives available to Solano County residents through Energy Upgrade California include PG&E's Basic and Advanced Retrofit Packages, pool pumps and motor rebates, efficient water heaters/blankets, HVAC upgrades, furnace upgrades, and wall insulation installation. The city will also promote resources such as California Flex Alert, the Department of Energy's (DOE) Weatherization Assistance Program for low-income households, and PG&E's SmartEnergy Analyzer™ program, all of which link residential property owners to educational and financial resources. In addition, PG&E is working to fulfill Goal 2.2 of the CPUC *Long-Term Energy Efficiency Strategic Plan*, which states, "By 2020, 100 percent of eligible and willing customers will have received all cost-effective Low Income Energy Efficiency measures."

Financing is critical to the success of the energy efficiency retrofit program. The city will continue to work with Solano County and other local jurisdictions to develop a Property Assessed Clean Energy program (see Measure E-3.2) to further promote energy efficiency retrofits. The city will also partner with local real estate professionals to inform homebuyers about the benefits of home energy audits and the availability of energy efficiency mortgages to finance installation of retrofit packages.

Action	Responsibility
A Develop and maintain a Solano County Sustainability Website with information about current energy efficiency rebates and incentives (including links to PG&E and Energy Upgrade California rebate pages) and local energy efficiency improvement case studies. Leverage Energy Upgrade California outreach and educational materials.	Sustainability Coordinator
B Provide training to Building and Fire Safety Department counter staff regarding available sources of rebates/incentives and printed pamphlets or FAQ sheets.	Building and Fire Safety; Sustainability Coordinator
C Provide targeted outreach to low-income and elderly households with information about the federal weatherization program and statewide Energy Savings Assistance Program, and how improvements can increase occupant comfort levels and reduce utility bills.	Community Development; Sustainability Coordinator

Progress Indicators ¹	Year
900 single-family houses install advanced retrofit package; 2,500 single-family houses install basic retrofit package; 325 multi-family units upgraded with advanced retrofit package; 825 multi-family units upgraded with basic retrofit package; 750,000 sq ft of nonresidential area installs comprehensive retrofit package; 2.2 million sq ft of nonresidential area installs basic retrofit package	2020
2,500 single-family houses install advanced retrofit package; 7,750 single-family houses install basic retrofit package; 900 multi-family units upgraded with advanced retrofit package; 2,500 multi-family units upgraded with basic retrofit package; 2.2 million sq ft of nonresidential area installs comprehensive advanced retrofit package; 6.5 million sq ft of nonresidential area installs basic retrofit package	2035

¹ Comprehensive retrofit packages include lighting and appliance upgrades, and space heating / cooling upgrades; basic retrofit packages include lighting and appliance upgrades

Measure E-1.2: Energy Efficiency Assessments

Supporting Measure – Not Quantified

Encourage voluntary energy assessments for residential and nonresidential buildings to identify cost-effective improvements.



Measure Background

The houses in Fairfield built before adoption of California’s Title 24 energy efficiency requirements are excellent candidates for energy-saving retrofits, which could be identified through energy assessments.

Building energy assessments can help identify and prioritize energy efficiency improvements by providing a building-specific list of retrofit options and their cost effectiveness.

Additionally, the California Energy Commission (CEC) developed the Statewide Home Energy Rating System (HERS) program to allow comparisons of the efficiency levels between California homes. A home’s HERS rating is calculated as part of an energy assessment, and informs homeowners and renters about energy efficiency much like the MPG metric allows comparisons of vehicles. This type of rating assists in estimating the relative utility costs associated with a home so that renters and buyers can factor those costs into their decision.

The city will partner with the Solano Center for Business Innovation to develop a comprehensive outreach campaign that describes the benefit of energy assessments and available rebates, incentives, and financing options, such as PG&E’s no- or low-cost energy assessment programs for nonresidential customers and residential energy assessment rebates available through Energy Upgrade California. Residential assessments should be performed per the Whole House Energy Rating required by Energy Upgrade California. To help residents finance home energy assessments, the city should pursue grant funding to provide a partial rebate for residents that voluntarily perform energy assessments. Previous sources of funding have included Energy Efficiency Conservation Block Grants (EECBG) and the CEC.

As part of this outreach campaign, the city will identify neighborhoods with concentrations of older homes to help focus the outreach toward buildings that will receive the greatest energy savings. In some cases, the funding for these upgrades may be tied to income eligibility.

The city will also work with PG&E to identify large energy users that would benefit from energy assessments and could be eligible for PG&E’s on-bill financing to install retrofit packages identified in the assessment. For these larger energy customers, PG&E offers low- or no-cost energy assessment services that include on-site analysis of energy consuming systems and customized calculations to help create a strategic plan for implementing projects. The city should also partner with local real estate professionals to help educate home buyers about the value of energy assessments at the point of sale. Realtors should also be encouraged to include a home’s HERS rating in the MLS listing.

Action	Responsibility
A Develop a comprehensive outreach campaign that describes the benefit of energy audits and available rebates, incentives, and financing options.	Solano Center for Business Innovation; Sustainability Coordinator
B Pursue grant funding to provide a partial rebate for residents and businesses that voluntarily perform energy audits.	Solano Center for Business Innovation; Sustainability Coordinator
C Identify neighborhoods with concentrations of older building stock to focus outreach campaign.	Community Development; Sustainability Coordinator
D Work with PG&E to identify large-energy users that would benefit from energy audits. Leverage PG&E’s on-bill financing option for nonresidential and municipal customers.	Community Development; Sustainability Coordinator

E	Partner with real estate professional groups to help educate home buyers and business owners about the benefits of energy audits at the point of sale.	Solano Center for Business Innovation; Sustainability Coordinator
F	Provide links on the city website to PG&E's do-it-yourself online energy audit program. (This information could be placed on a new Solano County Sustainability Webpage to leverage regional efforts.)	Community Development; Sustainability Coordinator

E-2: New Construction

Measure E-2.1: New Construction Energy Efficiency

2020 GHG Reduction Potential: **73 MT CO₂e/yr**

2035 GHG Reduction Potential: *Included in Statewide Reduction Zero Net Energy Building Goal*

Encourage energy-efficient new construction through promotion of energy-efficient mortgages and technical assistance programs for developers.



Measure Background

California Building Energy Efficiency Standards (Title 24, Part 6, 2008) serve as the basis for mandatory building energy efficiency standards. The California Green Building Standards Code (CALGreen), effective in 2011, also provides the city with the option of adopting an energy efficiency standard that surpasses the State’s basic requirements. CALGreen outlines two options: Tier I requires a building’s energy performance to exceed Title 24 requirements by 15 percent, while Tier II increases this standard to 30 percent. Revisions to the Title 24 Standards will be adopted in 2013 and will go into effect in 2015.

Although a mandatory ordinance to exceed Title 24 Standards through adoption of the Tier I or II standards will not be established at this time, the city will promote energy efficient new construction through its technical assistance program that provides local builders with information on green building practices, specifically those which relate to energy- and water-efficient design and construction practices. PG&E also developed the Savings by Design program to encourage energy-efficient construction in new commercial buildings. The program offers a range of services to building owners and their design teams, such as design assistance, design team incentives, owner incentives, and educational resources for customized new construction projects that exceed California's Title 24 energy efficiency standards.

The city will also encourage local real estate professional groups and area developers to provide outreach and information to home buyers about the benefits of energy efficiency mortgages, which allow homebuyers to finance the installation of energy efficient systems, such as solar photovoltaics or high-efficiency windows.

Action	Responsibility
A Provide plan-check for energy-efficient new commercial construction projects; define "energy-efficient" for plan-check purposes.	Building and Fire Safety
B Encourage local developers and realtors to distribute informational brochures about energy efficient mortgages to potential new home buyers.	Sustainability Coordinator
C Provide outreach to local developers, architects, and builders on PG&E's Savings by Design program.	Building and Fire Safety

Progress Indicators	Year
90 new single-family residential buildings exceed 2013 Title-24 by 30%;	2020
30 new multi-family residential units exceed 2013 Title-24 by 30%	

Measure E-2.2: Solar Ready Construction

Supporting Measure – Not Quantified

Encourage builders to incorporate solar-ready design into new construction, including building orientation for maximum solar exposure, pre-wiring and pre-plumbing for solar PV and solar hot water, and roof system construction that can handle additional loads of future solar installations.



Measure Background

Increasing the use of distributed renewable energy systems (e.g., rooftop solar photovoltaic) prevents the combustion of fossil fuels to generate electricity, thereby reducing GHG emissions. Fairfield’s location and geography result in a high solar insolation rating, which makes it an excellent candidate for effective adoption of solar technologies. The city can facilitate future installation of solar technologies by encouraging new construction to be oriented for maximum solar access, pre-wired and pre-plumbed to support PV systems and solar hot water systems, and constructed to support roof loads of solar installations. These front-end additions can reduce the cost of post-construction solar installations for homeowners. The city’s technical assistance program described in Measure E-2.1 could be used to provide information on solar-ready construction techniques.

Action	Responsibility
A Promote the city’s technical assistance program for developers to help implement this measure (see Measure E-2.1).	Building and Fire Safety

E-3: Financing

Measure E-3.1: Energy Efficiency Rebate Program

Supporting Measure – Not Quantified

Consider establishing a city or county rebate program to encourage implementation of energy efficiency retrofits.



Measure Background

PG&E currently offers rebates for various home energy efficiency improvements. In addition to PG&E rebates, numerous programs funded by state agencies and local governments are available to Solano County residents through the Energy Upgrade California program. The city will partner with other Solano County governments and agencies to identify gaps in existing rebate and incentive programs and jointly pursue funding to establish a local (e.g., Solano County) rebate program.

New rebates could be structured to encourage residents to buy goods or services from local businesses. For example, the city could develop an ENERGY STAR-rated appliance rebate program to supplement those currently offered through PG&E, by providing an additional \$50 rebate for appliances purchased from local vendors. Alternatively, the new rebate program could be structured to address the building improvement needs of a specific building type, such as small commercial properties or multi-family residential buildings.

Action	Responsibility
A Identify rebate/incentive gaps in PG&E- and Energy Upgrade California-sponsored programs to identify local financing needs.	Building and Fire Safety; Sustainability Coordinator
B Identify an outside funding source to finance rebate program (e.g., EECBG, ARRA).	Building and Fire Safety; Sustainability Coordinator

Measure E-3.2: PACE Financing Program

Supporting Measure – Not Quantified

Partner with the County and other local jurisdictions in their efforts to establish the Clean Energy Solano PACE program that would provide financing options for residential and nonresidential energy efficiency upgrades to existing buildings. Work with other Solano County jurisdictions to jointly pursue bond funding for a commercial PACE program through California FIRST.



Measure Background

A property-assessed clean energy (PACE) finance program is enabled through the AB 811 legislation. This bill allows land-secured loans for homeowners and businesses who install energy efficiency projects and clean-energy generation systems. Senate Bill 555 reinforced implementation opportunities for PACE programs by expanding the scope of activities allowed within a community facilities district, as defined by the Mello-Roos Community Facilities Act of 1982. A PACE program permits property owners within participating districts to finance the installation of energy- and water-efficiency improvements in their home or business through a lien against their property that is repaid through their property tax bill. If the property is sold, payment responsibility transfers to the new owners, allowing building owners to avoid up-front installation costs while at the same time requiring little or no investment of local government general funds. In some instances, the new lender may require repayment of the existing lien, in which case the remaining PACE loan is repaid from the proceeds of the property sale.

Fairfield is a participating member of the California FIRST program which allows PACE funding for commercial and multi-family residential projects. Fairfield would also be within the boundaries of the proposed Clean Energy Solano PACE program, which would make financing available to both residential and nonresidential projects.

An initial market analysis for the proposed Clean Energy Solano program estimated 3.5% participation in the first five years from both the residential and nonresidential sectors, which would lead to local economic benefits including approximately \$19 million in state and local tax revenue, the creation of 2,700 new jobs, and the generation of 37 MW of local renewable energy. Furthermore, building owners who participate in the PACE program are not required to front the initial capital costs.

Action	Responsibility
A Opt into the County's PACE program as a participating member.	Community Development; Sustainability Coordinator; Solano EDC
B Develop an outreach program describing available PACE financing options. Work with PG&E to identify large energy users to help focus outreach efforts.	Community Development; Sustainability Coordinator

C	Continue to participate in California FIRST to make PACE financing available to commercial, industrial, multi-family residential (5+ units), and nonprofit-owned buildings.	Community Development; Sustainability Coordinator
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E-4: Building Appliances

Measure E-4.1: ENERGY STAR Appliances

2020 GHG Reduction Potential: **228 MT CO₂e/yr**
 2035 GHG Reduction Potential: **518 MT CO₂e/yr**

Promote voluntary installation of ENERGY STAR and other high-efficiency appliances.



Measure Background

As Title 24 Standards require building shells and systems to become even more efficient, energy consumption from appliances and electronics will become an increasingly important source for reducing building energy use and residents’ utility bills. In 2009, approximately 28% of statewide residential electricity use was dedicated to appliances. Televisions, computers, and home office equipment accounted for an additional 20% of electricity use^{iv}. As big-screen televisions, smart phones, tablets, and other electricity-consuming devices become more commonplace in homes, their proportional share of home electricity use will likely increase as well. Installing ENERGY STAR appliances is one way to reduce energy use in this sector.

This measure is designed to encourage voluntary community participation to upgrade home appliances and lighting to ENERGY STAR or other energy efficient models. Successful implementation of this measure relies on leveraging the Energy Upgrade California program materials through a public outreach campaign to increase community awareness regarding energy efficient appliance choices. The ENERGY STAR rating is an internationally recognized standard for energy efficient consumer products. According to the EPA, devices that have an ENERGY STAR certification, such as office equipment, home appliances, and lighting products, generally use 20 to 30 percent less energy than required by federal standards. By promoting ENERGY STAR-rated home and business appliances, the city can help to reduce GHG emissions related to the use of lighting, refrigerators, dishwashers, clothes washers, wall air conditioning units, computers, photocopiers, lights, and other appliances.

Through Energy Upgrade California, PG&E currently offers rebates to customers who purchase ENERGY STAR dishwashers, clothes washers, refrigerators/freezers, ceiling fans, pool pumps, and room air conditioners. The city will partner with PG&E, Solano County Water District, local developers, and other relevant organizations to promote existing financial incentives and rebates for energy-efficient appliance upgrades and replacements.

Action	Responsibility
A Collaborate with PG&E, Solano County Water District, and other local organizations to promote existing financial incentive programs to encourage voluntary replacement of inefficient appliances with new ENERGY STAR appliances.	Building and Fire Safety; Sustainability Coordinator
B Provide outreach to local developers regarding sources of available rebates to encourage installation of ENERGY STAR-rated major appliances in new residential construction.	Building and Fire Safety; Sustainability Coordinator

Progress Indicators	Year
New residential construction installs energy-efficient appliances: 2,500 refrigerators; 3,000 clothes washers; 3,500 dishwashers; Existing residential units replace expired appliances with energy-efficient appliances: 9,300 refrigerators; 15,250 clothes washers; 23,000 dishwashers	2020
New residential construction installs energy-efficient appliances at the following rates: 4,800 refrigerators; 5,800 clothes washers; 6,800 dishwashers; Existing residential units replace expired appliances with energy-efficient appliances: 15,700 refrigerators; 23,000 clothes washers; 33,000 dishwashers	2035

Measure E-4.2: Smart Grid

2020 GHG Reduction Potential: 1,328 MT CO₂e/yr
2035 GHG Reduction Potential: 2,359 MT CO₂e/yr

Encourage adoption of smart grid-compatible appliances and energy management systems to shift peak-load energy use.



Measure Background

The ‘smart grid’ is an emerging energy management system which uses information technology to significantly improve how electricity is managed and controlled. Smart meters, which use a technology that enables users to take full advantage of the smart grid, will eventually provide utility customers with access to detailed energy use and cost information, new time-of-use pricing programs based on peak-energy demand, and the ability to program home appliances and devices to respond to energy use preferences based on cost, comfort, and convenience.

Current smart meters allow for frequent remote reading of energy usage by PG&E. However, the true value of the smart meter program will be fully realized when community residents and businesses begin making more informed energy use decisions based on the two-way communication enabled by smart meters, such as when a homeowner is able to program their washing machine to run when energy prices are lowest.

All investor-owned utilities are rolling out time-of-use pricing, which offers lower utility rates to customers that switch discretionary energy use to off-peak times. Time-of-use pricing is mandatory for all commercial customers, and will eventually be offered to residential customers as well. PG&E currently offers the SmartRate pricing plan to residential customers, which offers lower prices per kWh to customers that agree to reduce electricity use on “SmartDays” when intense heat drives up air conditioning use and therefore, electricity prices. PG&E has also joined OPower, a social media technology provider that helps customers using smart grid technology to compare their energy use with neighbors. To support use of their various pricing programs, PG&E created the Green Button Connect program to allow customers to share their energy usage data with third-party app developers that already have products to help customers track and manage their energy use. The assumption is that customer access to their own energy use trends will support behavioral changes to energy consumption, which will lower customers’ utility bills and lower PG&E’s costs to provide energy.

When estimating the potential GHG emission reductions associated with implementation of the smart grid, the city included the energy efficiency improvements gained from integrating smart grid energy management systems for control lighting, heating, ventilation, and air conditioning and other major appliances in residential and commercial buildings. According to CISCO, a world-wide leader in network technology, full integration of the smart grid will take time to realize, but energy analysts estimate it will ultimately be capable of reducing electricity-related GHG emissions by 30 percent below current levels.

Through public outreach efforts and targeted outreach to the development community, the city will promote voluntary adoption of smart-grid technology for homes and businesses. The city will train Building and Fire Safety Department staff on the benefits of smart-grid integration and provide informational materials on existing rebate programs.

Action	Responsibility
A Develop an outreach program that leverages existing PG&E materials, including description of the O-Power Program. Make information available at Building and Fire Safety Department counter.	Building and Fire Safety; Sustainability Coordinator
B Identify and advertise available rebates for smart-grid compatible appliances and systems on the County’s Sustainability Website.	Building and Fire Safety; Sustainability Coordinator

Progress Indicators	Year
5,000 residential units install smart-grid compatible appliances and systems; 3.0 million sq ft of commercial area installs smart-grid compatible appliances and systems	2020
11,250 residential units install smart-grid compatible appliances and systems; 6.4 million sq ft of commercial area installs smart-grid compatible appliances and systems	2035

Measure E-4.3: Permanent Load Shift

Supporting Measure – Not Quantified

Encourage participation in PG&E's Permanent Load Shift program to shift thermal cooling loads to off-peak and/or partial-peak hours.



Measure Background

PG&E’s Permanent Load Shift program, often referred to as “Shift & Save,” is to store thermal cooling capacity during off-peak hours and/or partial-peak hours in order to meet thermal cooling load in subsequent on-peak hours. The goal of this program is to shift 3.9 megawatts of load. The program’s targeted customers are bundled service, commercial, industrial, agricultural, and large residential customers in PG&E’s electric service territory. PG&E is working with Cypress Ltd. and Trane USA to implement this program.

The city will partner with PG&E to identify and provide outreach to local large-energy users that could financially benefit from participation in the program. The city will partner with PG&E and appropriate local organizations, like the Solano Center for Business Innovation, and the Solano Economic Development Corporation in its outreach activities to find regional efficiencies in program expansion and application in other Solano County cities. A statewide Permanent Load Shift technology incentive program is currently under development; the city should monitor its progress to identify opportunities for local application.

Action	Responsibility
A Work with PG&E to identify large-energy users that would benefit from peak-load shifting technologies and/or strategies. Targeted customers are bundled service, commercial, industrial, agricultural, and large residential customers.	Building and Fire Safety; Sustainability Coordinator
B Monitor development of the statewide Permanent Load Shift program to identify opportunities for local application.	Building and Fire Safety; Sustainability Coordinator

E-5: Building Cooling

Measure E-5.1: Building Shade Trees

2020 GHG Reduction Potential: **245 MT CO₂e/yr**

2035 GHG Reduction Potential: **501 MT CO₂e/yr**

Adopt a shade tree ordinance for new construction and develop a shade tree outreach campaign to encourage existing property owners to voluntarily plant shade trees.



Measure Background

Properly located trees can provide shading for residential and commercial buildings, and thereby reduce the need for air conditioning. The capacity of a tree to reduce GHG emissions is dependent on its age and species. As trees mature, their canopies increase in size and provide higher levels of shade and greater levels of building cooling in hot weather. Large, deciduous species are ideal for reducing building energy use as they provide shade in summer, but allow winter sunlight into buildings for passive solar gain in cooler weather. Additionally, trees gain carbon-capturing biomass in their trunks and roots as they absorb carbon from the air to grow.

The city will review its existing development requirements pertaining to street trees. As necessary, the city will amend the Zoning Ordinance and standard development conditions to require developers of new single-family residential units to plant two shade trees, and new multi-family residential buildings and new nonresidential buildings to plant one shade tree per 1,000 sq ft of air conditioned floor space. The city will also work with local organizations and neighborhood groups to promote voluntary shade tree planting in existing residential areas and existing commercial and industrial buildings. To facilitate proper implementation of this measure, the city will develop a shade tree planting guide to instruct home builders, developers, landscapers, building managers, and property owners on proper shade tree selection and placement to maximize building cooling opportunities while preserving solar access on the roof. Planting guidance should describe the selection of climate-appropriate species and proper siting specifications (i.e., S, SW, or W side of buildings; no more than 20’ from the building). The city will continue to enforce street tree and parking lot tree requirements in all commercial and residential development.

Action	Responsibility
A Amend the city’s Development Standards per the new shade tree ordinance; the ordinance would be applicable where appropriate during development review.	Planning Division
B Work with local environmental and conservation groups to advertise the various benefits of planting shade trees near existing buildings.	Building and Fire Safety

C	Develop a shade tree planting guide to facilitate proper tree selection and installation.	Building and Fire Safety; Public Works
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Progress Indicators	Year
12,500 new shade trees properly installed (does not include replacement trees for existing shade trees)	2020
26,750 new shade trees properly installed (does not include replacement trees for existing shade trees)	2035

Measure E-5.2: Parking Lot Shade Trees

Supporting Measure – Not Quantified

Develop a parking lot shade ordinance to reduce the urban heat island effect.



Measure Background

Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, and heat-related illness and mortality. A primary contributor to urban heat islands is unshaded asphalt pavement, including streets and parking lots. These types of surfaces absorb heat from the sun during the day and radiate that heat back to the surrounding environment throughout the day and into the night, raising local air temperatures.

The city will update its current parking lot landscaping requirements to require shade tree or shade structure installation at multi-family and commercial properties such that 50% of the parking lot is shaded within 10 years.

Action	Responsibility
A Upgrade parking lot landscaping requirements to include standards for parking lot shading at multi-family and commercial properties.	Planning

E-6: Building Lighting

Measure E-6.1: Indoor Lighting Efficiency

2020 and 2035 GHG Reduction Potential: See *Statewide Reduction AB 1109*

Encourage voluntary adoption of efficient indoor and outdoor lighting technologies in residential and nonresidential buildings.



Measure Background

According to the 2009 California Residential Appliance Saturation Study, approximately 20% of residential electricity consumption is attributed to lighting^v. In nonresidential buildings, conventional commercial lighting, including T12 fluorescent bulbs and old exit sign lights, consume more energy than new T8 lights and light-emitting diode (LED) technologies. Lighting upgrades typically provide a short payback period for their investment, and are a good source of GHG emissions reductions.

The city will provide outreach and technical assistance to nonresidential property owners to encourage participation in PG&E’s lighting upgrade program, which includes rebates for fixtures, lamps, accent/directional lighting, controls, and signage. The city will also provide outreach to multi-family property managers regarding lighting rebates through PG&E, including CFL replacement bulbs, activity sensors and timers, and replacing T-12 lamps with magnetic ballasts. Informational materials should demonstrate the simple-payback period associated with lighting improvements (typically 2-4 years). The city will also advertise PG&E’s CFL rebate, or other lighting rebate programs, on the new sustainability website.

Action	Responsibility
<p>A Develop lighting-efficiency informational materials that demonstrate the simple-payback period associated with lighting improvements and existing rebates. Post information on the Solano County Sustainability Webpage. Provided targeted outreach to large nonresidential building managers and multi-family property managers.</p>	<p>Building and Fire Safety; Sustainability Coordinator</p>
<p>B Leverage existing energy-efficient lighting rebate programs offered through Energy Upgrade California, including fixture and lamp replacements/installation, accent and directional lighting, security lighting, lighting control systems, and PG&E’s residential CFL rebate program.</p>	<p>Building and Fire Safety; Sustainability Coordinator</p>
<p>C Encourage small businesses to participate in PG&E programs that provide technical assistance and access to incentives for energy efficiency upgrades (e.g., lighting).</p>	<p>Solano EDC</p>

E-7: Renewable Energy

Measure E-7.1: Solar Photovoltaic Systems

2020 GHG Reduction Potential: **4,534 MT CO₂e/yr**

2035 GHG Reduction Potential: **6,668 MT CO₂e/yr**

Facilitate the voluntary installation of solar PV systems on residential and nonresidential buildings.



Measure Background

Solar photovoltaic (PV) systems generate electrical power by converting solar radiation into direct current electricity using semiconductors. PV power generation employs solar panels composed of cells containing photovoltaic material. PV systems can be retrofitted into existing buildings, usually by mounting them on an existing roof structure or walls. Fairfield's solar potential is approximately 5.1 kWh/m²/yr, which is sufficient to support a solar PV installation that would cover a large percentage of an average home's electricity demand^{vi}. In addition to residential rooftops, commercial and industrial rooftops tend to have large, flat roofs that are often well-suited for solar photovoltaic (PV). Parking lots also provide excellent opportunities for additional solar energy generation. According to PG&E data, Fairfield contains approximately 240 residential solar PV systems installed since 2005, with a total capacity of approximately 875 kW. The city also contains nonresidential solar PV systems totaling an additional 3.1 MW^{vii}. However, numerous barriers may prevent widespread adoption of solar PV technology, including city regulations, up-front costs, misinformation or lack of information.

Financing is critical to the success of the solar PV program. Property owners will be able to finance their PV systems through various financing programs and rebates. As described in Measure E-3.2, the city will support the development of and participation in two PACE programs to further promote renewable energy systems for residential and nonresidential buildings. Other financing models, such as power purchase agreements (PPAs), can be used to offset the initial capital cost of installing a solar PV system. Solar PV rebates are available through the California Solar Initiative and its related programs: New Solar Homes Partnerships, Multifamily Affordable Solar Housing Program, and Single-Family Affordable Solar Housing Program. Rebate amounts vary, and are typically based on the installed system size and expected performance. Some rebate programs have variable rebate steps, which decline as PV installed capacity increases.

The city will develop a comprehensive solar PV program that encourages homeowners to install PV systems through outreach advertising available rebate and incentive programs. Outreach efforts will aim to maximize community participation from homeowners, builders, and businesses by leveraging existing educational materials and links to technical assistance and rebates and financing programs. The city will encourage homeowners to request free solar PV audits provided by private solar financing and

installation companies. The city will also review and revise its zoning and building codes and other applicable ordinances to identify any regulatory barriers to solar installations (i.e., PV and solar hot water) on residential and nonresidential properties, and remove them if identified. The city will offer priority permitting for new solar PV systems to further reduce implementation barriers.

Action	Responsibility
A Review/revise all applicable building, zoning, and other codes and ordinances to identify potential regulatory barriers to the installation of solar PV or solar hot water systems in residential and nonresidential construction and remove barriers if identified.	Building and Fire Safety
B Develop a comprehensive outreach campaign to increase voluntary participation in solar PV installation programs, including a directory of existing rebates/incentive programs, explanation of simple-payback calculations for solar PV systems, and technical assistance. Leverage existing solar PV informational materials from Energy Upgrade California, the California Solar Initiative, and PG&E.	Building and Fire Safety; Sustainability Coordinator
C Develop informational materials about the benefits of PPAs offered through independent solar service providers. Post on the Solano County Sustainability Website, and make printed copies available at the Planning Department and Building Division counters.	Building and Fire Safety; Sustainability Coordinator

Progress Indicators	Year
2,375 single-family units install 4.5kW PV system 9.0 MW capacity installed on nonresidential and multi-family buildings	2020
3,050 single-family units install 4.5kW PV system 15.5 MW capacity installed on nonresidential and multi-family buildings	2035

Measure E-7.2: Solar Water Heaters

2020 GHG Reduction Potential: **295 MT CO₂e/yr**
 2035 GHG Reduction Potential: **1,660 MT CO₂e/yr**

Promote voluntary installation of solar water heaters in new construction and building retrofits through outreach campaign.



Measure Background

The effectiveness of a solar installation is described, in part, by its solar savings fraction (solar fraction). This measurement describes the percentage of a building’s total energy demand that can be met through installation of a solar energy system. A 0% solar fraction indicates that no solar energy utilization is possible, while 100% would indicate full utilization of solar energy to meet building energy demand. Dixon has a 65% solar

fraction for low-rise buildings (i.e., 1-2 stories) and a 44% solar fraction for multistory structures (i.e., 3 or more stories), indicating good potential for solar water heater applications.^{viii}

Solar water heating systems are a simple, reliable, and cost-effective method for harnessing the sun's energy to provide for hot water needs. Solar collectors, usually placed on the roof, absorb the sun's energy to heat water that is stored in a water tank. The State of California has recognized the value of solar hot water heaters. The California Solar Water Heating and Efficiency Act of 2007 (AB 1470), created a 10-year program aimed at installing solar water heaters in homes and businesses. AB 1470 was designed to lower the initial costs of purchasing a system, which averages around \$3,000-\$6,000.

Solar hot water systems can also be a cost-effective replacement for inefficient water heaters. According to the California Solar Initiative (CSI), solar hot water systems can lower energy bills by meeting 50 to 80 percent of hot water needs over a year. Though the high capital cost of solar water heater upgrades can pose a financial burden to homeowners, there are a range of financing and rebate options to offset these initial investment costs.

There are a number of financing options that may be used to reduce upfront costs, such as the PACE programs mentioned in Measure E-3.2, federal tax incentives through the Energy Policy Act of 2005, and financial incentives through the CSI-Thermal Program. Similar to the CSI solar rebate programs, the CSI-Thermal Program provides rebates for solar water heaters that decline in value as installation increases.

The Solar Water Heating Pilot Program, operated through San Diego Gas and Electric from 2007-2010, identified numerous barriers to the widespread adoption of solar water heating systems. In particular, participating contractors named permitting and inspection costs and delays as a primary obstacle to widespread adoption for single-family residential buildings because non-material costs represented approximately 65% of total system costs. That means, only 35% of total costs were related to the actual system price. To help address this problem, the city will review applicable building codes and ordinances to identify any potential barriers to the installation of solar water heaters, and work to remove barriers if identified.

The city will also work with PG&E to create outreach opportunities that provide information about the financial benefits of solar hot water heaters, describe existing financing options and rebate programs, and explain the city's efforts to encourage participation.

Action	Responsibility
A Collaborate with PG&E and the California Solar Initiative - Thermal Program to develop an outreach program to maximize installation of solar hot water systems and leverage existing funding opportunities.	Building and Fire Safety; Sustainability Coordinator
B Review/revise all applicable building, zoning, and other codes and ordinances to identify potential regulatory barriers to the installation of solar PV or solar hot water systems in residential and nonresidential construction and remove barriers if identified. [Same as Measure E-7.1 Action A]	Building and Fire Safety

Progress Indicators	Year
300 single-family residential units install solar hot water system; 100 multi-family units are served by solar hot water system	2020
1,700 single-family residential units install solar hot water system; 600 multi-family units are served by solar hot water system	2035

Measure E-7.3: District Energy Systems

Supporting Measure – Not Quantified

Encourage incorporation of district energy systems in new industrial growth areas that include on-site, or are located near, waste heat generation facilities.



Measure Background

District energy systems can provide a platform for utilizing waste heat and renewable energy sources and moving these resources around in a system to where and when they are most needed. Waste heat is generated through a variety of industrial processes, and can be captured and used as a heat source for buildings or to power other industrial processes.

District energy systems constructed to offset building heating loads require extensive infrastructure to capture heat from its waste source and deliver it to end users (e.g., residences, office buildings). In colder regions, the proportion of energy costs dedicated to space heating can be very high, which makes this type of system economically viable. Given the relatively low space heating demands in Fairfield, an extensive district energy system is not financially feasible. However, the city could identify its waste heat generators and attempt to attract compatible waste heat users that would benefit from the free use of process heat.

The city will work with the Solano Economic Development Corporation (EDC) to identify the thermal capacity of waste heat generators in Fairfield, and identify the types of industries that could beneficially use that type of heat in their processes.

Action	Responsibility
A Inventory and assess existing sources of waste heat in the city.	Solano EDC; Sustainability Coordinator
B Prepare educational and outreach materials with which to communicate Fairfield’s district energy opportunities to potential developers or other stakeholders.	Community Development; Solano EDC
C Work with Solano EDC to attract waste heat users (e.g., agricultural drying facilities) that can be co-located near waste heat generators.	Community Development; Solano EDC

Measure E-7.4: Community Choice Aggregation

2035 GHG Reduction Potential: See *Progress towards 2035 Target* discussion at end of chapter

Support the County in its efforts to develop a community choice aggregation program to provide Solano County residents with a choice in their energy provider.



Measure Background

Solano County included a measure in its CAP to investigate the potential for a countywide community choice aggregation program (CCA). Assembly Bill 117, which was signed into law in 2002, enables California cities and counties, either individually or collectively, to supply electricity to customers within their borders through the establishment of a CCA. Unlike a municipal utility, a CCA does not own the transmission and delivery systems, but is responsible for providing electricity to its constituent residents and businesses. The CCA may own electric generating facilities, but more often, it purchases electricity from private electricity generators.

A key benefit of a CCA is that the participating jurisdictions can determine the amount of renewable energy contained within the generation portfolio. For example, a Solano County CCA could decide to provide 50% of its electricity from renewable sources, which would exceed State requirements directing California’s utilities to provide 33% of their electricity from renewable sources by 2020.

Developing a CCA will require a detailed analysis of energy demand, efficiency opportunities, and renewable generation opportunities in Solano County. Using existing models from other counties (e.g., Marin County) is likely to reduce the initial program design costs. The program would be most effective if the city partnered with other Solano County cities and the County government to jointly pursue a CCA program.

The city will support the County and other interested participants in the preparation of feasibility studies, outreach campaigns, and other efforts to develop a countywide CCA. However, existing city funds are not proposed for this effort.

Action

Responsibility

<p>A Work with the County to prepare necessary study reports, informational materials, and any other supporting research and/or documents to help assess viability and appropriateness of pursuing a CCA program.</p>	<p>Sustainability Coordinator</p>
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E-8: Street and Area Lighting

Measure E-8.1: Street Light Upgrade

2020 GHG Reduction Potential: **352 MT CO₂e/yr**

2035 GHG Reduction Potential: **352 MT CO₂e/yr**

Continue the city's street light upgrade program.



Measure Background

Streetlights account for approximately 13% of the city’s municipal electricity use^{ix}. High-pressure sodium bulbs, commonly used in streetlights, require more energy and have a shorter lifespan than new induction and/or light-emitting diode (LED) lights. The short simple-payback period associated with lighting upgrades makes this an easy measure to implement.

The city has already started a program to upgrade its streetlights to LED technology, and will continue implementation of that program until all streetlights have been upgraded citywide.

Action	Responsibility
A Complete implementation of streetlight upgrade program.	Public Works

Progress Indicators	Year
100% of HPS bulbs are replaced with energy-efficient technology	2020 and 2035

Measure E-8.2: Traffic Signal Upgrade

2020 GHG Reduction Potential: **32 MT CO₂e/yr**

2035 GHG Reduction Potential: **32 MT CO₂e/yr**

Reduce energy consumption in the city's traffic signals through installation of energy-efficient lighting technology.



Measure Background

The city has already begun to replace the incandescent bulbs in traffic signals with LED bulbs. The city will finish implementation of its traffic signal upgrade program, and continue to use LED bulbs or similar technology in new and existing traffic signals.

Action	Responsibility
A Maintain current traffic signal upgrade program implementation.	Public Works

Progress Indicators	Year
100% of incandescent bulbs in traffic signals are replaced with energy-efficient technology	2020 and 2035

Measure E-8.3: Parking Lot Lighting Upgrade

2020 GHG Reduction Potential: **74 MT CO₂e/yr**
 2035 GHG Reduction Potential: **202 MT CO₂e/yr**

Continue ongoing parking lot upgrade program, building on progress at the City Hall complex and public parks, and promote lighting efficiency upgrades at private parking lots.



Measure Background

High-quality parking lot lighting is necessary to provide personal safety and deter theft and vandalism. However, conventional parking lot lighting, including high-wattage metal halide and high-pressure sodium lights, consumes more energy than new light-emitting diode (LED) technologies, which provide comparable lighting quality at a fraction of the energy consumption.

The city will continue to make parking lot lighting upgrades to reduce electricity use at municipal parking lots. To finance the program, the city could contract with an Energy Service Company (ESCO) to perform parking lot lighting energy audits and identify best available retrofit improvements. In most cases, the ESCO pays up-front costs associated with retrofit installation, further reducing financial risk to the city.

The city will also work with the Solano Center for Business Innovation to provide outreach to local businesses about the simple-payback period associated with parking lot lighting upgrades. Informational materials could include financial characteristics of the city’s previously installed upgrades and potential resources for financing or rebates. PG&E’s *Lighting Rebate Catalog* provides a comprehensive source for exterior lighting rebates, including fixtures and bulbs.

Action	Responsibility
A Maintain program implementation through CIP funding.	Public Works
B Develop outreach materials explaining simple payback period for pilot project, and available funding sources (e.g., PG&E, energy performance contracts).	Building and Fire Safety; Sustainability Coordinator
C Develop outreach campaign to encourage private parking lot owners to voluntarily upgrade their lighting technology by explaining the simple pay-back period for investments and providing a list of available rebates/incentives.	Building and Fire Safety; Sustainability Coordinator

Progress Indicators	Year
10% of parking lot lights are upgraded from HPS to energy-efficient technology	2020
25% of parking lot lights are upgraded from HPS to energy-efficient technology	2035

E-9: Municipal Actions

Measure E-9.1: Municipal Renewable Energy Development

2020 GHG Reduction Potential: **0 MT CO₂e/yr**

2035 GHG Reduction Potential: **453 MT CO₂e/yr**

Explore opportunities for installation of renewable energy facilities on municipal properties (e.g., landfills, wastewater treatment facilities, building rooftops).



Measure Background

Transitioning to clean energy sources will allow Fairfield to reduce communitywide emissions, and the installation of renewable energy systems on municipal buildings will show the city’s leadership in the area of renewable energy generation.

The city will assess the potential for installing renewable energy facilities on municipal properties in the future. The city will also continue to monitor the availability of funding for small-scale wind turbine projects, and collaborate with other regional governments and agencies to share information on best practices for developing renewable energy systems in Solano County.

Action	Responsibility
A Identify additional small-scale wind turbine funding sources to replace retired PG&E program.	Public Works; Sustainability Coordinator;
B Conduct study to identify potential municipal sites for renewable energy generation and associated costs.	Public Works
C Collaborate with other Solano County jurisdictions to identify best practices and funding strategies.	Public Works; Solano EDC; Sustainability Coordinator

Progress Indicators	Year
Develop 500 kW capacity of municipal renewable energy	2020
Develop 2 MW capacity of municipal renewable energy	2035

Measure E-9.2: Municipal Building Energy Efficiency

2020 GHG Reduction Potential: **483 MT CO₂e/yr**

2035 GHG Reduction Potential: **558 MT CO₂e/yr**

Establish a goal to reduce business-as-usual electricity use in municipal buildings by 15%.



Measure Background

Reducing municipal energy use will reduce communitywide GHG emissions, save taxpayer dollars, and set an example for the successful implementation of energy-saving technology.

To achieve 15% reductions in energy use over a 2005 baseline the city will perform energy audits on select municipal buildings to identify future potential for energy efficiency improvements. As described throughout this chapter, numerous financing options and rebate programs are available to fund energy-efficiency improvements. The city could also explore energy saving performance contracts to finance improvements. Under this type of agreement, an Energy Services Company (ESCO) completes building energy audits to identify the most cost-effective retrofit options. The ESCO guarantees the amount of energy that will be saved under a defined retrofit package, and further guarantees that the value of energy savings would be sufficient to cover efficiency upgrade costs as long as the price of energy does not fall below a stipulated floor price. In most cases, the ESCO pays up-front costs associated with retrofit installation, further reducing financial risk to the city.

In addition to addressing building performance, the city could provide information and training to city employees on how to reduce energy consumption in the workplace. The city could conduct one campaign per year, ideally during National Energy Awareness Month in October, to educate employees about their energy consumption at work and ways to reduce consumption (e.g., turning off computers and monitors, turning off

lights, using power strips). To incentivize participation, the city could consider advertising energy consumption trends during the campaign period and provide prizes for quantifiable reductions.

Action	Responsibility
A Perform energy audits on select city buildings to identify future potential for energy efficiency improvements.	Building and Fire Safety; Public Works
B Consider using an energy performance contract to finance efficiency retrofits.	Public Works
C Conduct city employee energy use reduction campaign and incentivize participation.	Public Works; Sustainability Coordinator

Progress Indicators	Year
Municipal building energy use is reduced by 3.7 million kWh/yr over 2005 baseline energy use	2020
Municipal building energy use is reduced by 4.3 million kWh/yr over 2005 baseline energy use	2035

Measure E-9.3: Wastewater Treatment Plant Process Optimization

2020 GHG Reduction Potential: 171 MT CO₂e/yr
 2035 GHG Reduction Potential: 171 MT CO₂e/yr

Continue to perform energy optimization audits at FSSD and implement audit results.



Measure Background

PG&E performs Integrated Energy Audits of wastewater treatment facilities to identify the most critical efficiency improvements and help sewer districts to select energy-saving projects and identify available financial incentives. PG&E helped the Fairfield Suisun Sewer District (FSSD) to save 1.3 million kWh/yr and install wind turbines with a 200 kW capacity. FSSD received \$350,000 in incentives from PG&E, contributing to a simple-payback of 2.7 years for its energy efficiency projects^x. FSSD now budgets for regular energy audits to ensure their facility is operating efficiently.

Action	Responsibility
A Continue to budget for regular Integrated Energy Audits on wastewater treatment plant operations.	FSSD

Progress Indicators	Year
Reduce energy use at FSSD by 1.3 million kWh from 2005 business-as-usual	2020 and 2035

Transportation + Land Use Strategy

Transportation-related emissions make up nearly 40% of the communitywide 2005 emissions inventory. Vehicle fuel efficiency, fuel carbon content, and vehicle operations, all influence the amount of transportation emissions generated in a community. However, these emissions are largely generated by the number of vehicle miles traveled (VMT) by residents and employees. Long vehicle trips and high numbers of trips create higher emissions.

While state-mandated technological changes in fuel efficiency and reductions in fuel carbon content will help reduce transportation emissions, significant reductions will require local action. Eliminating or shortening vehicle trips is made possible through increasing alternative transportation options, such as transit, bicycling, or walking, and through the distribution of diverse land uses relative to transportation options.

The transportation and land use strategy includes efforts to improve pedestrian mobility to encourage walking between nearby destinations and accommodate non-automotive circulation. Enhancing the bicycling network and improving access to transit stops also support alternative transportation options.

Where people live, work, shop, and play also determines how far they have to travel daily, whether they choose to walk, bike, use public transit, or drive. Measures that support mixed land uses and opportunities for higher density development along existing transit routes are essential to supporting alternative transportation options.

Facilitating a transition to alternative fueled vehicles and managing daily traffic demand can also reduce emissions. This includes incorporating alternative fueled vehicles in the municipal fleet, providing charging and refueling stations for alternative fueled vehicles communitywide, and assisting local businesses with automobile travel reduction efforts.

Emissions reductions from the transportation and land use strategy total 6,010 MT CO₂e/yr in 2020. This represents approximately 4% of total CAP measure reductions. While local transportation reduction estimates may appear low as compared to the proportion of transportation emissions in the city's baseline inventory, it should be noted that statewide actions addressing transportation emissions account for nearly 46% of total emissions estimated in this CAP. Many of the transportation measures included here support higher quality-of-life indicators, such as walkable communities, improved local air quality, and reduced traffic congestion.

T-1: Pedestrians + Bicycles

Measure T-1.1: Pedestrian Environment Enhancements

Supporting Measure – Not Quantified

Continue to plan for safe, attractive pedestrian environments that encourage walking between nearby destinations.



Measure Background

Pedestrian enhancements encourage walking, potentially increasing foot traffic to local retail establishments and businesses, while decreasing automobile trips and emissions. Pedestrian enhancements include the provision of seating, shading, way-finding signs, safe crosswalks, and traffic calming measures. Providing connectivity and convenient, enjoyable pedestrian areas also improves residents’ quality of life.

Recent efforts by the city to increase walking and pedestrian safety include the installation of flashing signal lights and curb extensions, called bulb-outs. Bulb-outs extend the sidewalk into the on-street parking lane to narrow the crossing width of a roadway for pedestrians. The city installed bulb-outs and flashing crossing lights in Downtown Fairfield and along Webster Street. The city also updated the General Plan in 2012 to incorporate a complete streets policy into the Circulation Element.

Moving forward, the city will continue to work with STA on updates to the Countywide Pedestrian Master Plan, including the prioritization of projects to be implemented within Fairfield. The Countywide Plan provides a framework for local governments to identify important improvements that would increase pedestrian safety in their cities and throughout Solano County. The Countywide Plan was developed so that it could be adopted by individual cities to serve as their local Pedestrian Master Plan, thereby fulfilling a common criterion of pedestrian-improvement grant funding programs. Fairfield will either adopt the Countywide Plan or develop its own Pedestrian Master Plan. The city should also identify funding sources to help install priority projects, particularly for instances when a local match is required to qualify for grant funds.

Action	Responsibility
A Develop Pedestrian Master Plan or adopt Solano Countywide Pedestrian Plan to serve as guidance for pedestrian improvements; update plan every 3-5 years	Public Works; Community Development
B Prioritize implementation of pedestrian enhancements as identified in Pedestrian Master Plan	Public Works; Community Development
C Identify funding sources to provide city's match for project planning, design, and construction	Public Works; Community Development

D	Implement city's complete streets policy requiring accommodations for non-automotive circulation on newly constructed roads and during major roadway improvement projects	Public Works; Community Development
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Measure T-1.2: Bicycle Infrastructure

Supporting Measure – Not Quantified

Continue to install bicycle paths and lanes within the community to increase bicycle ridership and safety.



Measure Background

The city adopted a Bicycle Master Plan as part of the complete streets policy within the General Plan’s Circulation Element to improve local bicycle infrastructure and encourage cycling for local trips and recreation. The plan aims to enable safe, convenient bicycle travel as an everyday means of transportation within the city through roadway design standards, extension of existing cycling infrastructure, and possible addition of development standards regarding bicyclist accommodations in office and business parks. Recent implementation activities have included installation of new bicycle lanes.

Fairfield also has citizen representation on STA’s Bicycle Advisory Committee, which is responsible for updating and monitoring the progress of the Solano Countywide Bicycle Plan and makes funding recommendations for countywide bicycle priority projects to the STA Board of Directors and member agencies.

The city will continue to implement its Bicycle Master Plan, including regular updates to its bicycle facility maps to encourage community cycling as an alternative transportation option. The city will prioritize bicycle infrastructure improvements based on its adopted plan, and continue to partner with STA to pursue opportunities for additional bicycle safety improvements. The city will also identify and work to remove barriers to widespread cycling within the community as part of long-range planning projects or development of specific plans.

Action	Responsibility
A Implement the city's Bicycle Master Plan included in the 2012 Circulation Element; regularly update map of existing and proposed bicycle facilities	Community Development; Public Works
B Prioritize bicycle improvements as shown on Bicycle Master Plan Map, balancing considerations for immediate safety concerns and long-term returns on strategic improvements	Community Development; Public Works
C Identify funding sources to provide city's match for project planning, design, and construction	Public Works
D Identify and work to remove barriers that could inhibit cyclists from accessing various transit stations / stops	Community Development; Public Works

Measure T-1.3: Bicycle Outreach Program

Supporting Measure – Not Quantified

Develop a bicycle outreach program to promote communitywide "bikeability" through safety programs, bicycle tune-up clinics/training, and partnerships with bicycle advocacy groups and cycling clubs.



Measure Background

Bicycle education and outreach are important to increasing bicycle safety and ridership within the community. These programs can increase community members' comfort with cycling for exercise or running daily errands, with instruction on proper bicycle maintenance, safe cycling techniques, and an introduction to local cycling groups. STA currently provides a successful countywide Safe Routes to School program, which includes bicycle rodeos for elementary school students and a Walk N' Roll week to teach safety in walking and cycling.

The city will continue to partner with STA on implementation of the Safe Routes to School program, including efforts to evaluate efficacy of the program to determine if modifications should be made in the future. The city will also support STA in implementation of the Countywide Wayfinding Signage Program Phase II. Regional bicycle trail directional signs were installed in Phase I of this regional program. Phase II will include installation of local wayfinding signs to help riders find points of interest, such as Downtown Fairfield, city parks, and the Civic Center. The city can also work with local cycling clubs or advocacy groups to identify dangerous conditions that should be addressed in future updates of the Bikeways Plan.

Action	Responsibility
A Work with STA to continue its bicycle safety education activities, including bicycle rodeos and Walk-and-Roll programs at local schools	STA; Public Works; Police
B Solicit comments from local cycling clubs/advocacy groups to identify dangerous cycling conditions within city; address problem areas through Safe Routes to School (SRTS) Program	Public Works; Community Development
C Support STA in effort to evaluate efficacy of existing SRTS program to identify changes in pedestrian or bicycle accidents and modify future program as necessary	STA; Public Works
D As funding permits, support STA in adoption and implementation of Countywide Wayfinding Signage Program Phase II	STA; Public Works

T-2: Public Transit

Measure T-2.1: Transit Route Stabilization

Supporting Measure – Not Quantified

Ensure maintenance of existing transit service programs before attempting to expand services.



Measure Background

Successful public transit systems shift commute trips from personal automobiles to buses, shuttles, trains, and other options. Well-designed public transit systems serve a community’s major residential, employment, and cultural centers at service intervals that allow riders to easily and predictably plan trips. Viable transit systems are dependent upon a sufficient ridership base, which often requires an average minimum population or employment density around transit stops.

Several transportation agencies operate transit routes within and through Fairfield, including FAST, Solano Express, VINE, and Soltrans. These agencies provide local transit services throughout the city, as well as connections to Sacramento, the Bay Area, and Napa County. STA also manages the Solano Napa Commuter Information website, which provides information on area vanpools and ride matching services.

Fairfield’s relatively lower-density development character makes the creation of a robust public transit system difficult. Rather than attempt to expand the geographic extent of the current transit system, the city will first work with STA to ensure existing levels of service continue into the future. The city will work with STA to implement its Short-Range Transit Plan, which includes near-term strategies to stabilize the existing transit system. The city will also continue to explore opportunities through the public planning process to increase densities and intensities within certain areas of the city. Measure T-3.1 and T-3.2 address land use strategies that could help to strengthen the existing transit system, and in the long-term, provide a sufficient ridership base to allow for system expansion.

Action	Responsibility
A Work with STA to implement findings of Short-Range Transit Plan to keep current transit systems viable	STA; Public Works
B Facilitate higher density development within designated Priority Development Areas to increase potential ridership of residents and employees along existing transit routes	Community Development
C Enhance local transit service next to high density, mixed-use development areas to take advantage of proximity to new potential transit riders	STA; Public Works

T-3: Land Use

Measure T-3.1: Transit-Oriented Development

2020 GHG Reduction Potential: **0 MT CO₂e/yr**

2035 GHG Reduction Potential: **1,738 MT CO₂e/yr**

Create opportunities for new high-density, mixed-use development adjacent to transit centers.



Measure Background

Transit-oriented development (TOD) places higher density and intensity development within walking distance of primary transit stops. This strategy brings residents and jobs closer to transit opportunities, providing additional ridership for the public transit system. Successful TOD can take various shapes, depending on the character of the community. TOD can focus on increasing employment near transit stops, typically within a ½-mile radius, provided adequate pedestrian connectivity is available for riders to then reach their jobs. It can also focus on increasing residential densities near transit stops, usually within a ¼-mile radius. TOD can also include a mix of uses (e.g., residential, office, retail) when the goal is to develop a more complete neighborhood center.

Community opposition to increased densities or intensities may hinder local efforts to encourage TOD. Local land use and development policies may also pose a barrier. Parking standards that ignore the potential for reduced automobile trips in TOD may inhibit development due to the high cost of providing parking. The city currently provides for shared parking in certain mixed use developments, which reduces total parking requirements.

The city also identified four priority development areas (PDAs) – Downtown South, Fairfield/Vacaville Train Station, North Texas Street Core, and West Texas Street Gateway. PDAs are locally-identified infill development areas near transit, in which there is a local commitment to developing more housing, amenities, and services to meet the needs of residents in pedestrian-friendly environments served by transit. The city's PDAs are good opportunities to test the TOD model, and further support Measure T-2.1 above. The Fairfield Train Station Specific Plan has already incorporated this approach with a town center designation, specific design guidelines, and zoning provisions that encourage flexible design, including transit-oriented development.

To further implement this measure the city will also consider the suitability of the two Texas Street PDAs for increased development density and/or intensity, and verify that adequate infrastructure exists to support that level of development in the future. Additional TOD opportunities may exist within the city and should be explored once the four identified PDAs have been pursued to the extent possible.

Action	Responsibility
A Where appropriate, allow reduced off-street parking requirements for transit-oriented and mixed-use developments, for developments providing shared parking, and for developments that incorporate travel demand management measures	Community Development
B Identify areas that could support net increase in population or employment through land use changes within 1/4 mile walking distance of transit stops	Community Development
C Work with Fairfield Suisun Sewer District to evaluate capacity for higher-density/intensity development in transit areas, and develop prioritization and funding strategies to complete necessary improvements	Community Development; Public Works
D Implement Fairfield Train Station Specific Plan, which includes higher density residential and commercial mixed-use land uses within 10-minute walk from proposed train station	Community Development; Public Works

Progress Indicators	Year
0 new TOD units built since 2005	2020
4,800 new TOD units built since 2005	2035

Measure T-3.2: Mixed-Use Development

2020 GHG Reduction Potential: **0 MT CO₂e/yr**

2035 GHG Reduction Potential: *Included in Measure T-3.1*

Encourage mixed-use development through land use and zoning designations to support alternative transportation options for certain daily activities.



Measure Background

The distribution of land uses and the degree of street connectivity within a city influences how people travel. Land use strategies that place daily needs near each other and near residential neighborhoods allows some trips to be made without a car. Development patterns that provide convenient pedestrian connectivity to parks, schools, retail, and jobs also supports non-automotive transportation options. Mixed-use development often creates these pedestrian-friendly environments with a variety of uses nearby that allow people to address some or all of their daily live, work, play and shop needs in one place.

Single use zoning, as the name implies, only allows one type of land use within an area, which can result in large areas dominated by a single development type, such as single-family houses or shopping. This type of development makes use of alternative transportation options difficult because densities are often too low to support public

transit and the distances between different land uses are too great to encourage walking or cycling.

The city’s General Plan includes a Mixed Use designation, as well as General Plan policies and programs to designate underutilized land within parts of the city for higher density, mixed-use projects. The city’s Zoning Ordinance provides Mixed Use Residential Development Regulations that describe density and intensity levels for mixed use projects, as well as open space and parking requirements. The Fairfield Train Station Specific Plan also includes 265 acres of mixed-use designations, as well specific planning areas designed for development of higher-density, walkable communities with services and employment provided in nearby planning areas.

In conjunction with the transit-oriented development measure described above, the city will work to identify opportunities for future mixed-use development through land use and zoning changes. The same parking analysis described in Measure T-3.1 can be used to determine if parking requirements for mixed-use development can be reduced based on shared parking opportunities that result from mixing land uses.

Action	Responsibility
A Identify opportunities to increase mixed-use development around transit centers, primary transit stops, and/or within designated Priority Development Areas	Community Development
B Reduce off-street parking requirements for transit-oriented and mixed-use developments, for developments providing shared parking, and for developments that incorporate travel demand management measures [Same as T-3.1 Action A]	Community Development
C Implement Fairfield Train Station Specific Plan, which includes higher density residential and commercial mixed-use land uses within 10-minute walk from proposed train station [Same as T-3.1 Action D]	Community Development; Public Works

T-4: Alternative Fuels

Measure T-4.1: Alternative Fuel Vehicles

2020 GHG Reduction Potential: **3,330 MT CO₂e/yr**

2035 GHG Reduction Potential: See *Progress towards 2035*

Target discussion at end of chapter

Encourage communitywide use of alternative fuel vehicles through expansion of alternative vehicle refueling infrastructure.



Measure Background

Alternative-fueled vehicles use electricity, compressed natural gas (CNG), liquefied petroleum gas (LPG), hydrogen fuel cells, or other fuel types that have lower carbon content than traditional gasoline and diesel fuel. As engine technologies continue to advance, alternative-fueled vehicles have become increasingly popular to reduce fuel costs and emissions.

One of the primary challenges to increased adoption of alternative-fueled vehicles has been limited refueling infrastructure available to support the various vehicle types. Often referred to as “range anxiety”, an incomplete network of refueling infrastructure limits broad adoption of these vehicles as drivers feel confined to the limits of their known refueling locations. Local governments can play a role in combatting range anxiety by exploring cost-effective opportunities to install recharging infrastructure for electric vehicles, requiring pre-wiring for electric charging stations in new developments and parking lots, and working regionally to construct expensive infrastructure, such as CNG and LPG refueling stations.

The city will look for cost-effective opportunities to install electric vehicle charging stations in publicly accessible areas of the community, through grant funded opportunities or donations from technology providers. The city will also encourage pre-wiring for at-home electric vehicle charging stations in new development, and will consider developing requirements for the installation of EV charging units in new parking lots. The city will continue to support STA’s efforts to develop a regional CNG refueling station that could be used to refuel municipal fleet vehicles, and support efforts to make this charging station available for public use, if possible.

Action	Responsibility
A Continue to explore cost-effective ways to increase alternative vehicle charging / refueling infrastructure within the city	Public Works; Community Development; Sustainability Coordinator

B	Encourage pre-wiring for at-home electric vehicle charging ports in future new single family and multi-family construction	Building Division; Sustainability Coordinator
C	Work with STA to develop informational brochures and technical support for developers / contractors interested in providing electric vehicle charging ports in new projects	STA; Building Division; Sustainability Coordinator

Progress Indicators

Year

5% of gasoline passenger cars switch to plug-in hybrid electric (PHEV);	2020
5% of gasoline light-duty trucks switch to PHEV;	
5% of diesel passenger cars switch to PHEV;	
5% of diesel light-duty trucks switch to PHEV	

Measure T-4.2: Municipal Alternative Fuel Vehicles

Supporting Measure – Not Quantified

Shift municipal vehicle fleet from gasoline- and diesel-powered vehicles to alternative-fueled vehicles, to the extent possible.



Measure Background

Compressed natural gas (CNG), hybrid vehicles, and plug-in electric vehicles are increasingly being incorporated into municipal fleets nationwide to help reduce vehicle-related emissions, lower operating costs, and show sustainability leadership at the local government level.

Many municipal fleet vehicles could be replaced with cleaner versions capable of performing the same tasks upon regular vehicle replacement. Passenger vehicles and light-duty trucks can often be replaced with battery electric vehicles or plug-in hybrid electrics. Some diesel-powered heavy-duty vehicles and equipment can be replaced with CNG or LPG vehicles, if refueling infrastructure is available. Recent diesel and natural gas prices have made this type of replacement feasible from an economic standpoint as well.

In an effort to modernize the city’s municipal fleet, the city will support efforts to develop a regional alternative fuel vehicle procurement program to leverage economic benefits of bulk purchases. The city will also partner with STA in its efforts to develop a regional CNG refueling station for use by municipal fleets. Development of this facility could support future conversion of the FAST fleet to CNG vehicles.

Action	Responsibility
A Consider purchasing alternative fueled vehicles and/or more fuel-efficient vehicles during routine vehicle replacement	Public Works
B Support STA in its efforts to develop a CNG refueling station for public and private use within Solano County	STA; Public Works
C Pursue grant funding or vendor's promotional offers to install EV charging stations at city facilities for use by municipal vehicles	Public Works; Sustainability Coordinator
D Consider partnering with other Solano County governments in regional alternative fueled vehicle procurement program to achieve lower vehicle costs through bulk procurement	Public Works; Sustainability Coordinator

T-5: Transportation Demand Management

Measure T-5.1: Demand Management Program

2020 GHG Reduction Potential: **1,367 MT CO₂e/yr**

2035 GHG Reduction Potential: **2,242 MT CO₂e/yr**

Provide informational resources to local businesses subject to SB 1339 transportation demand management program requirements and encourage voluntary participation in the program.



Measure Background

Transportation demand management (TDM) programs are a collection of policies and incentives that reduce travel congestion at peak commute hours. Common TDM practices include subsidized or pre-tax transit passes, flexible work hours, emergency rides home, vanpool or carpool incentives, and parking cash-out programs that pay employees who agree to give up their guaranteed parking spaces.

SB 1339 authorizes the Bay Area Air Quality Management District (BAAQMD) and Metropolitan Transportation Commission (MTC) to adopt and implement a regional ordinance known as the Bay Area Commuter Benefits Program. The program requires employers with 50 or more employees within MTC’s jurisdiction to select one of four commuter benefit options (e.g. transit or vanpool subsidy). Within Fairfield, the Wal-Mart on West Texas Street is already participating in this program.

The city will support STA, which is largely responsible for implementation of the TDM program, in its efforts to comply with program requirements. STA already has a well-established rideshare network and incentivizes the creation of new vanpools, which are

seen as the likeliest path towards compliance for Solano County jurisdictions. The city currently has three park-and-ride locations, which could be used to support implementation of vanpool and rideshare programs; two of the city’s park-and-ride lots have access to transit.

BAAQMD has made funding available to help its members comply with the legislation. The city will also work with STA on an outreach campaign directed at local businesses of fewer than 50 employees, to attract voluntary participation in the TDM program.

Action	Responsibility
A Support STA’s efforts to implement SB 1339 TDM program requirements	STA; Sustainability Coordinator
B Work with STA on outreach campaign targeting employers with 50 or fewer employees to encourage voluntary participation in TDM program activities, including pre-tax deductions for transit expenses, new vanpool creation, and Solano Commute Challenge	STA; Sustainability Coordinator

Progress Indicators	Year
11,000 employees voluntarily participate in rideshare program or telecommuting/alternative work schedule	2020
18,000 employees voluntarily participate in rideshare program or telecommuting/alternative work schedule	2035

Measure T-5.2: Intelligent Transportation System

2020 GHG Reduction Potential: 1,313 MT CO₂e/yr
 2035 GHG Reduction Potential: 1,313 MT CO₂e/yr

Continue to apply traffic signal coordination, as appropriate, on major local roadways to reduce congestion during peak travel times.



Measure Background

Building an efficient transportation system can improve traffic flow and reduce congestion-related transportation emissions. Intelligent transportation systems (ITS) incorporate traffic signal synchronization on major roadways to reduce instances of “stop-and-go” traffic and vehicle idling.

In partnership with CalTrans, the city received a grant from MTC’s Program for Arterial System Synchronization to develop optimized signal timing plans for five Caltrans intersections and 21 City of Fairfield intersections along various corridors. Signal coordination occurred on Waterman Boulevard/Air Base Parkway, North Texas Street, West Texas Street, and Beck Avenue. The goal of the project was to develop signal coordination plans for the morning, mid-day, and evening peak periods that respond to changes in traffic patterns and volumes along the corridor. The program provides travel

safety and efficiency benefits to commuters and pedestrians. The program will provide benefits to bicyclists and pedestrians through increased “green time” and adjusted “Walk” signal timing that will allow safer passage through intersections. The program will also decrease travel time on transit and for automobile commuters through increased average travel speeds and reduced signal delay and stops.

The city will continue to partner with CalTrans on ITS strategies and work to identify new opportunities for ITS expansion as new growth areas develop and traffic increases.

Action	Responsibility
A Continue to partner with CalTrans on implementation of ITS projects in Fairfield	Public Works
B Explore opportunities for additional ITS projects as city's new growth areas develop	Public Works

Progress Indicators	Year
143,245 gallons of fuel saved	2020 and 2035

Water Strategy

Water-related GHG emissions primarily come from the energy used to pump, transport, and treat potable water and wastewater. Water-related emissions accounted for approximately 4.5% of the communitywide GHG inventory.

With water supplies expected to continue declining into the future, water conservation strategies have the added benefits of aligning demand with future water availability, improving public health, and saving ratepayers money.

Senate Bill (SB) X7-7 (2009) requires the state to achieve a 20% reduction in urban per capita water use by December 31, 2020. The state is required to make incremental progress toward this goal by reducing per capita water use by at least 10% on or before December 31, 2015. SB X7-7 requires each urban retail water supplier to develop both long-term urban water use targets and an interim urban water use target. This law also creates a framework for future planning and actions for urban and agricultural users to reduce per capita water consumption 20% by 2020.

The GHG emissions reduction potential from implementing SB X7-7 locally is 2,230 MT CO₂e/yr in 2020, which represents 1.5% of total emissions. While the level of emissions reductions attributed to this measure is relatively small, the long-term water conservation benefits it provides are highly valuable to an agricultural community such as Solano County.

W-1: Urban Water Management Plan

Measure W-1.1: SB-X7-7

2020 GHG Reduction Potential: **2,230 MT CO₂e/yr**

2035 GHG Reduction Potential: **2,722 MT CO₂e/yr**

Implement the water conservation policies contained within the city's Urban Water Management Plan.



Measure Background

The City of Fairfield is the urban water service provider to residents and businesses within the city limits. In accordance with state law, the city adopted its most recent Urban Water Management Plan (UWMP) in 2010.

As part of its UWMP, the city demonstrates its current and future abilities to provide water within its service boundaries. Additionally, SB X7-7 requires that urban water providers adopt conservation targets and implementation plans that will achieve a 20% per capita water use reduction by 2020. The city incorporated its water conservation

targets and plan into its current UWMP. In general, the plan identifies best management practices (BMPs) in water conservation, including:

- + residential water surveys and retrofits,
- + system and large landscape water audits and leak detection,
- + metering and conservation pricing,
- + public information and educational programs,
- + energy efficient appliance and high-efficiency toilet rebate programs, and
- + water waste prevention measures.

In addition to the water conservation programs identified in the UWMP, the city adopted a Water Efficient Landscaping Ordinance. The ordinance applies to all new and rehabilitated landscaping for public agency projects, private nonresidential development projects that require a building permit, and developer-installed residential landscaping. To demonstrate compliance with water conservation requirements, the ordinance requires preparation of a landscape documentation package that includes the following items:

- + design concept statement and certificate of design compliance,
- + soils report,
- + annual water budget (total maximum allowable water usage for the project),
- + water budget compliance chart,
- + grading plan,
- + scaled landscape design plan,
- + irrigation design plan, and
- + maintenance procedure manual.

This CAP assumes that the city will implement the BMPs identified within its UWMP, and will achieve its 2020 water conservation targets. The Water Efficient Landscaping Ordinance is treated like an implementation program to support the UWMP.

Action	Responsibility
A Implement water conservation policies contained within city's Urban Water Management Plan	Public Works

Progress Indicators	Year
20% reduction in per capita water use by 2020 over baseline established in UWMP	2020 and 2035

Solid Waste Strategy

Solid waste disposal creates emissions when organic waste (e.g., food scraps, yard clippings, paper and wood products) is buried in landfills and anaerobic digestion takes place, emitting methane. Additionally, the extraction and processing of raw materials for consumer products, distribution to consumers, and eventual disposal of the products, creates emissions as well. In Fairfield, about 3% of GHG emissions are associated with solid waste generation and disposal in landfills.

The zero-waste concept in waste management is a high-level goal to increase communitywide solid waste diversion efforts above the 90% range. Implementation of the county's Integrated Waste Management Plan can help to shift waste generation patterns over time. Other opportunities to reduce waste and related emissions include programs to divert waste away from landfills, increase recycling rates, reuse waste byproducts (e.g. construction materials), and expand organic waste collection.

Recycling helps to remove organic materials, like recyclable paper and cardboard, from the waste stream where it would ultimately contribute to landfill methane emissions. One option to increase recycling is through the enhancement and promotion of commercial paper recycling campaigns, in an effort to divert a broader range of recyclable paper away from landfills. Additionally, measures can encourage coordination between local businesses, waste haulers, and the County Department of Resource Management to increase commercial waste diversion and identify reusable waste byproducts. Construction and demolition waste can also be diverted, in increasingly higher proportions, through recycling or material reuse.

Although a number of the solid waste measures presented below cannot be quantified at this time, the results of their implementation will still make meaningful contributions to statewide emissions reduction efforts. Their inclusion within this CAP also provides future opportunities for regional implementation efforts, should other local governments seek collaboration on any of these measures.

The total GHG emission reduction potential of the waste strategy is 855 MT CO₂e/yr in 2020. Solid waste reductions represent approximately 1% of total reductions in 2020.

SW-1: Waste Reduction

Measure SW-1.1: Landfill Diversion

Supporting Measure – Not Quantified

Maximize waste diversion communitywide through implementation of the City's Source Reduction and Recycling Element of the General Plan.



Measure Background

The purpose of a solid waste strategic plan is to establish a framework that allows a community to achieve long-term waste reduction goals. Implementation of such a plan would be a comprehensive effort including expanded recycling programs, green waste and organics collection, source reduction, and byproduct re-use from area industries. Assembly Bill 939 requires local jurisdictions to meet numerical diversion goals. Although landfill capacity is no longer considered the statewide crisis it once was, solid waste diversion programs protect public health and safety and extend the operable life of the area's landfills.

The Solano County Department of Resource Management works with local jurisdictions to prepare the *Countywide Integrated Waste Management Plan (CIWMP)* and its periodic updates. Fairfield will continue to work with the county on implementation of the CIWMP, and will establish a non-binding goal to exceed the 50% communitywide solid waste diversion requirements in AB 939. Longer-term strategies like this, while not intended to be implemented immediately, will help the city to make progress on its future emissions reduction goals. The city can also leverage its existing relationship with its franchise waste hauler, Republic Services, to identify local opportunities for additional waste reductions.

Action	Responsibility
A Continue to work with the County Department of Resource Management to update and implement the Countywide Integrated Waste Management Plan (CIWMP)	Public Works; Sustainability Coordinator
B Establish non-binding goal and implementing strategy to exceed 50% communitywide solid waste diversion requirements established by AB 939, either through updates to CIWMP elements or through preparation of standalone strategic plan	Public Works; Sustainability Coordinator
C Work with franchise waste haulers to identify additional opportunities for solid waste diversion	Public Works

Measure SW-1.2: Commercial Recycling Program

Supporting Measure – Not Quantified

Increase commercial paper recycling rates through implementation of AB 341 and targeted outreach campaigns.



Measure Background

Commercial establishments typically generate white paper, mixed office paper, newspaper, and corrugated cardboard. Approximately 90% of all office waste is paper. According to the US EPA, commercial establishments also generate a large portion of the estimated 24.1 million tons of corrugated cardboard discarded each year. Enhanced office paper recycling will help reduce emissions associated with organic landfill waste, and help to conserve raw materials.

Assembly Bill 341 (2011) requires development of commercial and multi-family residential recycling programs statewide. AB 341 also sets a 75% statewide recycling goal for 2020 (as compared to the 50% solid waste diversion requirements embodied in AB 939). As the city’s contract waste hauler, Republic Services has already reached out to commercial and multi-family property owners within the city to begin recycling service. Republic Services also provides assistance with commercial waste audits, employee training and education, and provides support to local businesses in selecting the appropriate recycling program for their needs.

The regional sustainability coordinator will work with area franchise waste haulers to develop informational materials to help increase office paper recycling. These materials should highlight the broad range of office paper products that can be recycled.

Action	Responsibility
A Support franchise haulers, as necessary, in their outreach efforts to increase recycling rates among commercial and multi-family residential customers, as specified in AB 341	Public Works; Sustainability Coordinator
B Work with County Department of Resource Management and franchise waste haulers to develop enhanced paper recycling outreach campaign directed at office managers that explains full range of recyclable paper products that can be diverted from solid waste stream	Public Works; Sustainability Coordinator

Measure SW-1.3: Source Reduction Program

Supporting Measure – Not Quantified

Identify opportunities for creative reuse of industrial waste material.



Measure Background

Source reduction programs are strategies to reduce the volume of waste generated by certain activities or processes, and are designed to eliminate waste before it is created. These programs typically influence the design, manufacturing, and packaging of goods and materials to decrease both resource inputs and waste outputs. These programs can also be applied at the broader community level to address certain waste-generating activities. The promotion of reusable shopping bags is a common source reduction program intended to minimize solid waste disposal and pollution associated with plastic bag use.

At the individual business scale, source reduction programs can result in operational costs savings related to solid waste disposal or even become a revenue generator. For example, the Campbell Soup Company (with local operations in Dixon) has waste recycling programs that focus on recycling food waste, corrugated paper, steel drums, office paper, plastic, fluorescent tubes, batteries, wood pallets and scrap metal. In addition, Campbell's Asset Recovery program recycled or reused almost 1.2 million pounds of used equipment in 2012, generating nearly \$700,000 in sales revenue.^{xi}

Certain businesses may also find that the waste materials produced from their operations can be used as the input material for another business. This type of symbiotic relationship could result in operating costs savings for both businesses, if these industry connections can be identified. Solano County's agricultural sector could be an excellent candidate if beneficial reuse opportunities can be found for its organic waste stream. The Solano Center for Business Innovation has organized round table discussions with Allied Waste, one of the franchise waste haulers operating within the county, to identify opportunities for waste reuse at a local industrial park. This type of discussion could be expanded to include other waste haulers, large waste generators, and business leaders to identify interconnection among the county's industries and businesses. Results from these discussions could help inform a targeted economic development campaign. If a beneficial waste product is found to be in abundance, businesses that use such a product as an input material could be enticed to co-locate closer to the resource. The city will partner with the Solano Center for Business Innovation, franchise waste haulers, and local industries to identify potential byproduct reuse.

Action

Responsibility

<p>A Work with Solano Center for Business Innovation, region's franchise waste haulers, and local industries to identify opportunities to reuse waste byproducts from one manufacturing process as input materials for another</p>	<p>Sustainability Coordinator; Solano Center for Business Innovation</p>
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SW-2: Organic Waste

Measure SW-2.1: Residential Food Scrap and Compostable Paper Diversion

2020 GHG Reduction Potential: 47 MT CO₂e/yr

2035 GHG Reduction Potential: 1,484 MT CO₂e/yr

Encourage participation in collection of food scraps in green waste bins through public outreach campaigns.



Measure Background

According to CalRecycle, food scraps comprised nearly 16% of the state’s total waste stream, including more than 25% of the residential waste stream.^{xii} Food scraps are unwanted cooking preparation and table scraps, such as banana peels, apple cores, vegetable trimmings, bones, egg shells, meat, and pizza crusts. Compostable paper, sometimes called food-soiled paper, usually comes from the kitchen and is not appropriate for paper recycling due to contamination. Materials such as stained pizza boxes, uncoated paper cups and plates, used coffee filters, paper food cartons, napkins, and paper towels are all compostable paper. Diverting these organic items from the landfill helps to reduce methane gas generation from anaerobic decomposition, and helps to extend the operable life of a landfill.

Fairfield’s current waste hauling contract with Republic Services allows for collection of food items such as, coffee grounds, egg shells, grain products, baked goods, bones, meat, and fish in its green waste bins. However, there is limited participation data available to determine what percentage of household food waste is successfully being diverted. To encourage additional participation in this type of collection, the city will partner with the Solano County Resource Management Department and Republic Services on public outreach campaigns, including local elementary school programs, explaining what foods can be composted and why it is important. These outreach campaigns should leverage existing information materials developed by StopWaste.org and the City of San Francisco to the extent possible. The city will also discuss opportunities with their franchise waste hauler to expand the existing food scrap collection program to include compostable paper in the city’s green waste bins.

Action	Responsibility
A Partner with Solano County Resource Management Department and franchise waste haulers on public outreach campaign promoting food scrap collection in green waste bins	Public Works; Sustainability Coordinator
B Provide information to local elementary schools on existing food scrap diversion program for incorporation into on-going recycling curriculum	Public Works; Sustainability Coordinator

C	Meet with franchise waste hauler to discuss contract amendment to include compostable paper (e.g., soiled paper plates, napkins, paper towels) collection service through green waste bins	City Manager's Office; Public Works
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Progress Indicators	Year
25% of Fairfield households divert 20% of their food scraps through green waste bins or on-site composting	2020
50% of Fairfield households divert 75% of their food scraps and compostable paper through green waste bins or on-site composting	2035

Measure SW-2.2: Commercial Food Scrap Collection

2020 GHG Reduction Potential: **59 MT CO₂e/yr**
 2035 GHG Reduction Potential: **813 MT CO₂e/yr**

Continue to enroll new businesses in Fairfield's commercial food scrap collection program.



Measure Background

According to CalRecycle, food scraps comprised nearly 16% of the state's total waste stream, including more than 15% of the total commercial waste stream.^{xiii} Commercial food scrap generators include facilities with industrial kitchens, such as hotels, restaurants, schools and universities, and conference centers, as well as food distributors, such as grocery stores. Other commercial land uses, like offices and retailers, typically generate much lower volumes of food scraps than these other uses.

The city, through its franchise waste hauler, currently has a voluntary commercial food scrap collection pilot program aimed helping commercial kitchens, restaurants, schools, and grocery store to divert organic materials from their solid waste stream. These types of programs typically work to remove logistical barriers associated with food scrap collection, including space limitations for additional collection bins, odor and pest control related to collection frequency, and employee training and/or customer education on how the programs work. The city will continue to research best practices for commercial food scrap collection in similarly sized communities, and then work with local business organizations and its franchise waste hauler to further refine the city's existing voluntary food scrap collection program. Good working relationships with local business organizations will be instrumental in increasing participation rates.

Action	Responsibility
A Work with franchise waste haulers, Fairfield Suisun City Chamber of Commerce, Fairfield Main Street Association, and other local business organizations to increase participation in city's voluntary commercial food scrap collection program	Public Works; Sustainability Coordinator
B Identify opportunities to share best-practices and lessons learned with other cities in Solano County that have implemented similar programs	Sustainability Coordinator

Progress Indicators	Year
20% of Fairfield's commercial businesses divert 50% of their food scraps from solid waste stream	2020
40% of Fairfield's commercial businesses divert 75% of their food scraps and compostable paper from solid waste stream	2035

Measure SW-2.3: Yard Waste Diversion

2020 GHG Reduction Potential: **314 MT CO₂e/yr**
 2035 GHG Reduction Potential: **1,016 MT CO₂e/yr**

Encourage participation in yard waste diversion through public outreach campaign.



Measure Background

Yard waste includes leaves, grass clippings, and downed branches, and can easily be composted through either backyard composting or yard waste collection programs. Yard waste diversion helps avoid methane generation at landfills, extends a landfill's operable lifetime, and provides opportunities for beneficial reuse of this nutrient-rich organic material.

Fairfield residents receive a green waste bin from the city's franchise waste hauler for home yard waste collection, including grass cuttings, small tree and bush trimmings, leaves, flowers and weeds. Republic Services also provide green waste management services to business customers, including removal of landscape debris from office campuses, business parks, malls, and schools. The city's website also provides a link to the Solano County Recycle Guide, which provides information on yard waste disposal and composting.

Participation rates are typically very high throughout the state for residential green waste collection since the programs are easy to understand and the collection bins are often provided as part of the regular solid waste collection service. To enhance participation in the compostable food collection program described in Measure SW-2.1, the city will partner with the Solano County Resource Management Department and

franchise waste haulers to promote the disposal of yard waste and food scraps in green waste bins.

Action	Responsibility
A Partner with Solano County Resource Management Department and franchise waste haulers on public outreach campaign to promote use of green waste bins for yard waste collection instead of trash bins; campaign should be combined with food scrap diversion efforts	Public Works; Sustainability Coordinator

Progress Indicators	Year
90% of residential units divert 95% of their yard waste through green waste bins or on-site composting; 90% of non-residential properties divert 95% of their yard waste through green waste bins or on-site composting;	2020 and 2035

Measure SW-2.4: Construction and Demolition Waste

2020 GHG Reduction Potential: 435 MT CO₂e/yr
2035 GHG Reduction Potential: 2,111 MT CO₂e/yr

Continue to enforce the city's construction and demolition waste diversion ordinance.



Measure Background

According to CalRecycle’s 2008 Statewide Waste Characterization Study, construction and demolition (C&D) materials account for approximately 29 percent of the waste stream in California, including scrap lumber which comprises nearly 15% of the statewide total^{xiv}. Scrap lumber is an organic material, and therefore generates methane emissions through anaerobic decomposition in a landfill. It is also a highly reusable material, which helps conserve virgin natural resources. Many other construction materials can also be diverted from the waste stream for reuse or recycling, including concrete and asphalt, bricks, scrap metal, and drywall.

The California Green Building Code currently requires 50% diversion of C&D materials for all new residential and commercial projects, with few exceptions. CalRecycle provides a list of best practices and other resources on its website to help cities and contractors comply with this requirement. Fairfield has codified this state requirement through its Municipal Code, which includes an ordinance requiring 50% of C&D waste from applicable projects be diverted from landfills through recycling, reuse, or diversion programs. Residential, commercial, and industrial construction or demolition projects over 1,000 square feet must comply with the ordinance. Prior to permit issuance, applicants must submit a Waste Reduction Recycling Plan that identifies the estimated C&D diversion level to be achieved. Alternatively, applicants can provide copies of a signed contract with an authorized C&D collector for consideration in lieu of a Waste

Reduction Recycling Plan. The city’s website also has a link to the Solano County Recycle Guide with information on C&D material recycling and reuse opportunities in Fairfield.

As green building practices become more common in the region, waste haulers and contractors will improve their abilities to divert higher percentages of C&D waste in support of project documentation requirements for various green building certification programs (e.g., LEED, Green Point Rated).

Implementation and monitoring challenges limit full participation in the state’s C&D diversion efforts, even though the requirements are codified in the Green Building Code and the city’s Municipal Code. Some communities have addressed the issue of compliance through development of a C&D diversion deposit program, in which the project applicant pays a deposit (as a percentage of total project costs or on a square foot basis) in exchange for a building permit. The deposit is reimbursed to the applicant upon submittal of appropriate documentation showing what level of diversion was achieved by the contractor or waste hauler. The program could also be structured to forgo deposit requirements if applicants provide a signed contract with an authorized C&D collector that clearly states the level of diversion to be achieved.

The city will continue to enforce its existing C&D ordinance, and will consider increasing its diversion requirements to 75% of scrap lumber or 75% of total C&D waste as part of future CAP updates, provided that local C&D collectors and area landfills can achieve higher diversion rates. The city will also consider development of a C&D diversion deposit program to ensure widespread compliance with its diversion requirements.

Action	Responsibility
A Consider increasing diversion requirements to 75% diversion by 2020; alternatively, only target scrap lumber with 75% diversion requirement	Building Division; Public Works; Sustainability Coordinator
B Consider developing Construction and Demolition Debris Diversion Deposit Program to help enforce C+D ordinance, in which deposit is paid to city prior to issuance of building permit and refunded to applicant following submittal / approval of applicable waste diversion documentation; alternatively, an applicant could provide a signed contract with an authorized C&D collector in lieu of a deposit	Building Division; Public Works; Sustainability Coordinator

Progress Indicators	Year
50% of C&D waste is diverted from 90% of applicable new construction/renovation projects	2020
75% of C&D waste is diverted from 90% of applicable new construction/renovation projects	2035

Green Infrastructure Strategy

Green infrastructure refers to the natural features of a community that also provide an often unnoticed community benefit. In Fairfield, green infrastructure includes the urban forest, parks, landscaped medians and parkways, and other natural landscapes. These areas can reduce the urban heat island effect, perform stormwater management, and improve air quality and public health.

As one component of the green infrastructure network, urban forests provide shade and can reduce the heat island effect, which causes temperatures to increase in areas with concentrations of exposed pavement and rooftops. These higher temperatures can lead to increased air conditioner use, which increases energy consumption and can strain utility infrastructure at peak hours of the day. Urban forests also provide a visual amenity for residents and habitat value for wildlife.

The city also recognizes other beneficial aspects of trees. Trees beautify neighborhoods, increase property values, reduce noise and air pollution, and create privacy. Additionally, trees gain carbon-sequestering biomass in their trunks and roots as they absorb carbon dioxide from the air to grow. The measure in this section seeks to enhance Fairfield’s already well-established urban forest.

The total GHG emission reduction potential of the Green Infrastructure Strategy is 1,275 MT CO₂e/yr in 2020. This represents about 1% percent of total 2020 reductions anticipated from CAP implementation.

GI 1: Green Infrastructure

Measure GI1.1: Urban Forest Program

2020 GHG Reduction Potential: 1,275 MT CO₂e/yr

2035 GHG Reduction Potential: 2,527 MT CO₂e/yr

Support natural carbon sequestration opportunities through development and maintenance of a healthy, vibrant urban forest using outreach, incentives, and strategic leadership.



Measure Background:

Fairfield’s urban forest comprises trees planted on both public and private lands. The city’s development standards require new parking lots to include one tree for every 10 stalls along the periphery, and one tree for every eight stalls within the internal parking area. The city also requires one street tree every 25-35 linear feet for residential

development. Measure E-5.1 in this CAP would also require the planting of shade trees in new residential and nonresidential projects. In addition to these required tree plantings, private property owners often choose to incorporate trees into their landscaping. Collectively, all of these trees represent the city’s urban forest, and provide air quality benefits, shading, community pride, wildlife habitat, natural stormwater management benefits, visual character, and long-term carbon sequestration.

The city developed a Tree Conservation ordinance to establish mechanisms and policies for protecting public trees from unnecessary removal, maintaining public trees in good health, and replacing public trees where necessary so that the community may continue to enjoy the many benefits associated with its trees. The ordinance was also developed to facilitate that planting and maintenance of public trees by civic groups, neighborhood organizations businesses, and homeowners through an Adopt-a-Tree program.

The city will enforce existing tree-planting requirements for new construction and parking lots, including the new shade tree ordinance described in Measure E-5.1, as well as existing requirements for the replacement of removed street trees. The city will also identify neighborhood groups and/or urban forestry organizations that can be engaged to help promote and manage a healthy urban forest. These organizations could assist in communitywide tree planting campaigns designed to increase the voluntary planting of shade trees or landscape trees. They could also play a role in maintaining public trees through the city’s Adopt-a-Tree program to reduce the operational burden on the Public Works Department.

Action	Responsibility
A Enforce existing tree-planting requirements for new construction and parking lots, including new shade tree ordinance described in CAP energy measures	Community Development
B Identify opportunities to partner with urban forest organizations or similar groups to encourage voluntary tree planting and proper maintenance	Community Development; Public Works; Sustainability Coordinator
C Advertise shade-tree-giveaway programs or other incentives, when available	Public Works; Sustainability Coordinator
D Enforce existing tree protection ordinance that requires replacement of street trees that are removed	Public Works

Progress Indicators	Year
13,500 new trees planted in the community	2020
26,750 new trees planted in the community	2035

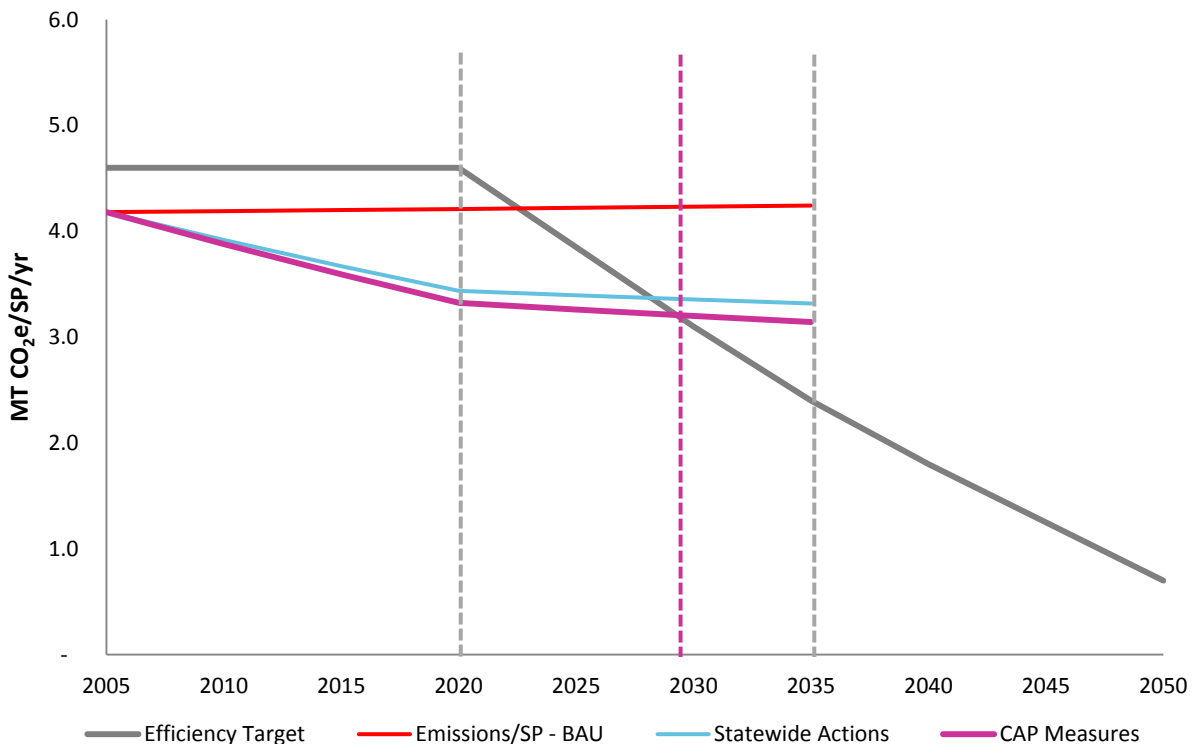
Target Achievement

PROGRESS TOWARD 2020 TARGET

The measures described above, combined with the state actions described in Chapter 2, have the potential to reduce communitywide emissions by 152,422 MT CO₂e/yr from projected 2020 levels. Although the nature of the community’s emissions projections combined with the service population target established in Chapter 2 would require no local or statewide action to achieve the 2020 target, measures included in this CAP will result in deep emissions reductions by 2020. This progress **exceeds** the city’s 2020 reduction target of 4.6 MT CO₂e/SP/yr, demonstrating near-term achievement of 3.3 MT CO₂e/SP/yr. The early actions included within this CAP will help to put the city on a trajectory towards longer-term reduction targets.

Figure 3.2 shows the additive impact of statewide actions and local actions that achieve the city’s 2020 target. Business-as-usual emissions forecast through 2035 are shown in red. The impact of known and quantifiable statewide actions is shown in blue, with the local actions of this CAP’s measures shown in fuchsia. The vertical dashed gray lines mark the 2020 and 2035 horizon years. As shown, the combination of statewide and local actions reduces the city’s emissions below the solid gray target line in 2020, indicating target achievement. The vertical dashed fuchsia line marks where the city’s emissions are estimated to increase above the long-term target trajectory line; this occurs in approximately 2028. Beyond that date, statewide actions and these CAP measures no longer reduce emissions below the reduction target line.

Figure 3.2 – 2020 Target Achievement



PROGRESS TOWARD 2035 TARGET

As shown in Figure 3.2, the city will not achieve a 2035 target with the identified statewide and local measures alone. Emissions reductions totaling 344,255 MT CO₂e/yr would be required to achieve the 2035 target (i.e., 2.4 MT CO₂e/SP/yr). However, this CAP estimates future reductions of only 205,573 MT CO₂e/yr in 2035, or 3.1 MT CO₂e/SP/yr.

Several variables will influence the city's ability to achieve future longer-term targets. First, statewide actions, which provide the majority of reductions in this CAP, are shown to flat-line beyond the 2020 horizon year. This is due to the fact that the Scoping Plan has only quantified the impacts of statewide actions through 2020. While the 2008 Scoping Plan has been revised, the new and revised actions included therein have not yet been quantified, so local governments are not yet able to take credit for the local share of those actions. It is likely that the state will continue to develop actions and programs that will support achievement of its 2050 statewide reduction target. However, at this time the potential future impact of those actions is unknown.

Second, new technologies that support additional emissions reduction may be developed between now and 2035. Existing technologies may also become more effective or financially viable for increased implementation. One example is the cost and ubiquity of solar photovoltaic panels, which have experienced exponential market growth during the last few decades. Increased renewable energy development could be a large source of future emissions reductions.

Third, additional local CAP measures may be developed during future plan updates, or CAP measures may be implemented at higher rates than previously estimated. The 2035 reduction estimates are based on the best available data and assumptions, but the future is difficult to predict accurately. Regular emissions inventory updates will be the best predictor of future target achievement, and will help the city to identify emissions sectors that need additional attention.

Fourth, and final, future target achievement is based on numerous growth estimates, which may or may not be accurate in reality. If the city grows faster than anticipated in the emissions inventories, it will become harder to achieve long-term targets without deeper implementation of CAP measures. However, if the city grows more slowly, so too will its emissions, potentially making future targets easier to achieve.

LONG-TERM REDUCTION OPPORTUNITIES

As part of the CAP development process, the participating cities considered several measure options that would provide long-term reduction opportunities, but would also require regional collaboration for successful implementation. These additional measures could be applied to the estimated statewide and local actions included in this CAP to demonstrate a pathway towards future target achievement. However, these options were not developed with the same level of detail as the local CAP measures included in this chapter, and are provided here for informational purposes only. Rough estimates of future emissions reduction potential were calculated using readily-available data and studies. Additional analysis would be required to ensure their feasibility for local implementation.

These measures were included here so that conversations with regional partners and local residents can begin early, with the hope that some or all of the measures are ready to begin implementation by 2020.

PG&E Green Option

2035 Reduction Potential (Municipal): 3,527 MT CO₂e/yr

PG&E is in the process of finalizing its proposed Green Option Program, which would allow customers to voluntarily purchase 100% renewable electricity. The California Public Utilities Commission (CPUC) will respond to PG&E's proposed program by July 1, 2014. If approved, PG&E expects the program to be available for subscription within a few months following approval. The program is currently expected to be capped at 125 MW of demand and for a five-year pilot program. It is currently unknown how participation will be granted should the program become fully-subscribed.

The city could consider participating in this program so that 100% of municipal electricity is generated from renewable sources. Though municipal emissions only represent a fraction of total communitywide emissions, this program provides an opportunity to demonstrate regional leadership in emissions reductions. Residents and local businesses will also be able to voluntarily participate in this program. A similar program offered by the Sacramento Municipal Utility District currently has an approximately 10% voluntary participation rate.

City Actions to Consider

- + Review participation costs with regards to municipal electricity expenses when final program information is available
- + Evaluate benefits to city's participation

Community Choice Aggregation

2035 Reduction Potential (75% participation): 66,502 MT CO₂e/yr

This option is included above as a stand-alone measure to highlight its importance for long-term target achievement. As described in Measure E-7.5, community choice aggregation allows a city or cities to supply electricity to customers within their borders through the establishment of a CCA. Solano County included a measure in their CAP to explore development of a CCA in partnership with the county's cities. CCA's are typically designed as an opt-out program, which means that all residents and businesses within its boundaries are automatically enrolled in its service with the ability to opt out and remain with PG&E as their utility provider. This type of enrollment is one reason that CCA programs enjoy high participation rates. For example, Marin Clean Energy began serving customers in May 2010, and currently procures electricity for 75% of electric customers in Marin County.

The city could consider participating in regional conversations regarding opportunities and challenges to establishing a Solano County CCA.

City Actions to Consider

- + Collaborate with regional partners to evaluate feasibility for CCA development (e.g., start-up costs, funding sources, legal considerations, participation estimates)

Alternative Fuel Vehicles

2035 Reduction Potential: 43,422 MT CO₂e/yr

Advancements in alternative fuel vehicle technologies make long-term market adoption seem likely. As described in Measure T-4.1 above, there are actions the city can take to facilitate this market transition, including pre-wiring requirements in new construction for electric vehicle charging stations, pursuit of grant funding to install public charging infrastructure, and collaboration with STA and local cities on development of a CNG refueling station. The reduction potential shown above is dependent upon decreasing vehicle costs resulting from further technological advancement and increasing market adoption that brings to bear economies of scale in automotive manufacturing. This estimate includes a transition away from gasoline and diesel vehicles to plug-in hybrid electric vehicles, battery-electric vehicles, and compressed natural gas vehicles throughout the range of vehicle class categories (e.g., passenger cars, light duty trucks, buses).

As the use of electric vehicles increases, it will become more important to clean the electricity grid in order to maximize the emissions reductions associated with alternative fuel vehicles.

City Actions to Consider

- + Research best-practices in facilitating market shift towards alternative fuel vehicles through local policies
- + Participate in regional collaboration on CNG refueling station
- + Explore opportunities to convert Ready-Ride vehicles to alternative fuel vehicles

Advanced Methane Capture

2035 Reduction Potential (95% capture): 17,762 MT CO₂e/yr

The city could explore opportunities with their franchise waste hauler to send the community's solid waste to a landfill facility with a highly-efficient methane control system. These advanced systems can capture 90-95% of fugitive methane emissions, significantly reducing solid waste emissions. A variety of factors should be considered before pursuing this option. The city should work with their franchise waste hauler to identify nearby landfills that have advanced methane capture systems and capacity to accept new customers. The cost premium of shipping to such a facility should also be considered, particularly as compared to the amount of emissions that could potentially be reduced. Further analysis may indicate that this option is either technically or financially infeasible.

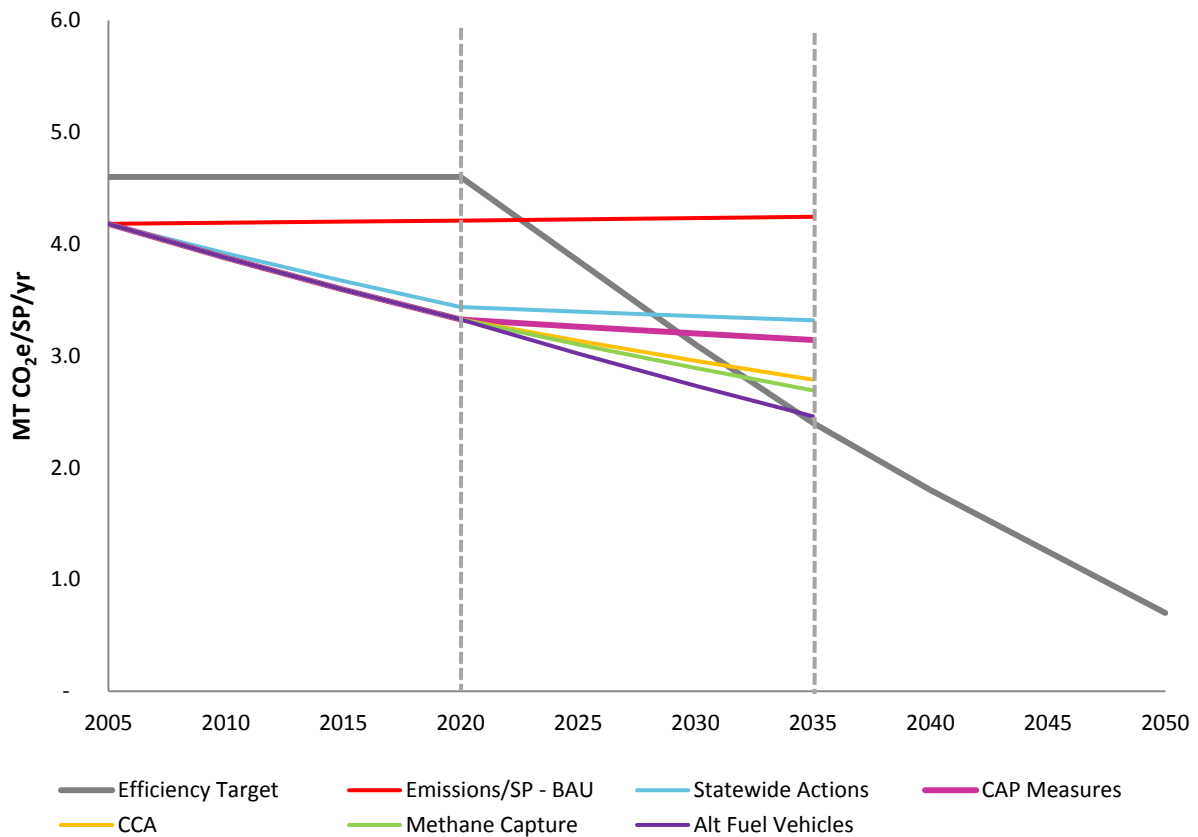
City Actions to Consider

- + Identify area landfills with advanced methane capture systems
- + Discuss potential costs with franchise waste haulers
- + Further analyze emissions reduction potential; compare to future emissions reduction gap and potential costs

Figure 3.3 shows that development and implementation of these measures (excluding the PG&E Green Option to avoid double-counting with the CCA program) would nearly achieve the 2035 target. Combined with the reduction estimates in Table 3.1, these measures would bring total reductions to 333,259 MT CO₂e/yr in 2035, which represents 2.5 MT CO₂e/SP/yr. Though a gap of 10,966 MT CO₂e/yr still exists, the target could yet be achieved based on the earlier description of unknown variables influencing longer-range reduction targets.

At the very least, Figure 3.3 provides a framework to demonstrate what it will take to mirror the state’s aggressive long-range targets at the local level. The largest reduction opportunities known at this time are likely to come from cleaner electricity sources and a large-scale shift towards alternative-fuel vehicles.

Figure 3.3 – Long-Term Reduction Options



Notes

ⁱ US Census, 2010.

ⁱⁱ PG&E, 2012. Available at:
http://www.pgecorp.com/sustainability/en03_clean_energy.jsp.

ⁱⁱⁱ US Census, 2010.

^{iv} California Energy Commission. *2009 California Residential Appliance Saturation Study*. Prepared by KEMA, October 2010.

^v *ibid.*

^{vi} National Renewable Energy Laboratory Renewable Resource Data Center, 2011.

^{vii} PG&E. *PG&E Generation Interconnection Services Progress Report for Fairfield*. October 2012.

^{viii} California Energy Commission. *Solar Water Heating CEC 2013 Title 24 Pre-rulemaking Workshop*. June 9, 2011.

^{ix} PG&E, October 2012.

^x PG&E. *Case Study: Fairfield Suisun Sewer District Integrated Energy Management*. August 2009.

^{xi} Campbell's Soup, 2012. Available at:
http://csr.campbellsoupcompany.com/csr/pages/resources/reports-and-data.asp#.UxTKgvldV_4.

^{xii} California Integrated Waste Management Board. *California 2008 Statewide Waste Characterization Study*. Prepared by Cascadia Consulting Group, August 2009. Available at:
<http://www.calrecycle.ca.gov/Publications/Documents/General/2009023.pdf>.

^{xiii} *ibid.*

^{xiv} *ibid.*

CHAPTER 4

BENCHMARKS + IMPLEMENTATION

4

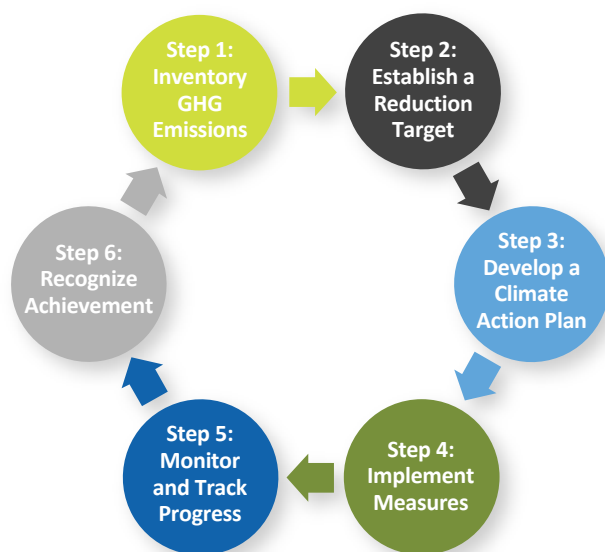
This chapter describes how city staff would implement CAP measures and related actions, and track the performance metrics identified for each measure as part of the larger Regional CAP Program. The chapter also discusses the need to evaluate, update, and amend the CAP over time, so the plan remains effective and current. Using the CAP to evaluate future project consistency is presented with regards to mandatory and voluntary nature of the CAP's measures. Lastly, the chapter gives an overview of potential funding sources to support CAP implementation. While funding sources are continually evolving, this section presents types and sources of funding that are currently, or known to be regularly, available in order to help focus the city's effort.

Implementation and Monitoring

Ensuring that the CAP measures translate from policy language into on-the-ground results is critical to the success of the plan. To facilitate this, each measure described in Chapter 3 contains a table that identifies specific actions which the city would carry out, and the departments responsible for each action. Each table also provides performance metrics to enable city staff, the City Council, and the public to track measure implementation and monitor overall CAP progress. The tables provide both interim (2020) and final (2035) performance metrics. Interim performance metrics are especially important, as they provide checkpoints to evaluate if a measure is on the right path to achieving its GHG reductions.

Figure 4.1 was presented in Chapter 1 to describe the first three steps in the CAP development process. This chapter describes strategies to approach Steps 4 and 5, which cover the implementation and monitoring process.

Figure 4.1 – Steps in the CAP Development Process



PERFORMANCE METRICS

The performance metrics are directly related to the estimated GHG emissions reductions. Therefore, they are written to provide a quantifiable measurement to accurately track progress toward the reduction target. For example, Measure E-7.1 encourages voluntary installation of rooftop solar photovoltaic systems. The measure's estimated GHG emissions reductions are based on numerous assumptions, including the number of residential and commercial buildings that will install solar photovoltaics between 2005 and the 2020 and 2035 target years (including those that have already installed systems since 2005). The performance metric assumes that 2,375 single-family residential buildings will include a 4.5 kW solar PV system by 2020 (in addition to those already existing in the 2005 baseline year). This measure also assumes that 9.0 MW of

new solar photovoltaic capacity will be installed on multi-family and commercial buildings by 2020. If there is greater adoption of solar photovoltaics than estimated in this measure, then additional emissions reductions would occur. Likewise, if installations fall short of the estimates described here, then this measure would achieve less than its stated reductions. Participation rate assumptions are described in Appendix C.

STAFFING AND COORDINATION

Upon adoption of the CAP, the city departments identified for each measure in Chapter 3 would become responsible for implementing assigned actions. Key staff in each department would facilitate and oversee this work, working in tandem with the proposed regional Sustainability Coordinator. To assess the status of city efforts, CAP plan implementation meetings should take place several times a year. Some actions will require inter-departmental or inter-agency cooperation, and appropriate partnerships would need to be established.

REGIONAL CLIMATE ACTION PLANNING PROGRAM COORDINATION

This CAP was developed in tandem with three other Solano County cities as part of a Regional Climate Action Planning Program. To ensure an approach that is mutually beneficial and efficient, measures and actions were developed with regional relevance. Table 4.1 provides a summary of the measures identified in Chapter 3 as candidates for regional implementation. These measures have the potential to save city resources and effort when coordinated and implemented regionally. Appendix E presents the full list of regional implementation opportunities that were considered, including a comparison to the adopted CAPs of Solano County and the Cities of Benicia and Vallejo.

The primary option for developing and managing a successful regional strategy is to establish the role of Sustainability Coordinator (see Measure CC-1.1 in Chapter 3) to facilitate this process, either at the city-level or as a regional position housed within a county agency. This person would have the ability to work with the participating cities on implementation of regional measures, as well as coordinate with Solano County and city staff from Benicia, Vallejo, and Vacaville on countywide programs. Additional funding would be needed to support development of regionally applicable outreach campaigns and shared resources, such as a Solano County Sustainability Website (see Measure CC-1.2 in Chapter 3).

**Table 4.1
Regional Implementation Measures**

CROSS-CUTTING STRATEGY		CITIES¹	RESPONSIBILITY
CC-1.1	Sustainability Coordinator	All	Community Development; Solano EDC
CC-1.2	Public Outreach	All	Community Development; Sustainability Coordinator
ENERGY STRATEGY		CITIES	RESPONSIBILITY
E-1. Existing Buildings			
E-1.1	Energy Efficiency Retrofit Outreach	All	Sustainability Coordinator; Community Development; Building Division
E-1.2	Energy Efficiency Assessments	All	Solano Center for Business Innovation; Sustainability Coordinator; Community Development
E-2. New Construction			
E-2.1	New Construction Energy Efficiency	All	Building and Fire Safety; Sustainability Coordinator
E-2.2	Solar-Ready Construction	All	Building and Fire Safety
E-3. Financing			
E-3.1	Energy Efficiency Rebate Program	All	Sustainability Coordinator; Community Development
E-3.2	PACE Financing Program	All	Solano Center for Business Innovation; Building Division
E-4. Building Appliances			
E-4.1	ENERGY STAR Appliances	All	Sustainability Coordinator; Community Development; Building Division
E-4.2	Smart Grid	All	Building Division; Sustainability Coordinator
E-6. Building Lighting			
E-6.1	Building Lighting Efficiency	All	Building Division; Sustainability Coordinator
E-7. Renewable Energy			
E-7.3	District Energy Systems	Dixon, Fairfield, Suisun City	Solano EDC; Sustainability Coordinator; Community Development; Building Division; Public Works
E-7.4	Community Choice Aggregation	All	Sustainability Coordinator
E-8. Street and Area Lighting			
E-8.1	Street Light Upgrade	Dixon, Rio Vista, Suisun City	Public Works
E-9. Municipal Actions			
E-9.1	Municipal Renewable Energy Development	Dixon, Fairfield, Rio Vista	Solano EDC; Sustainability Coordinator; Public Works

TRANSPORTATION + LAND USE STRATEGY		CITIES	RESPONSIBILITY
T-1. Pedestrians + Bicycles			
T-1.3	Bicycle Outreach Program	All	STA; Public Works
T-4. Alternative Fuels			
T-4.2	Municipal Alternative Fuel Vehicles	All	STA; Public Works; Building Division; Sustainability Coordinator
SOLID WASTE STRATEGY		CITIES	RESPONSIBILITY
SW-1. Waste Reduction			
SW-1.3	Source Reduction Program	All	Sustainability Coordinator; Solano Center for Business Innovation
SW-2. Organic Waste Diversion			
SW-2.1	Residential Food Scrap and Compostable Paper Diversion	All	Sustainability Coordinator; City Manager’s Office
SW-2.2	Commercial Food Scrap Collection	All	Sustainability Coordinator
SW-2.3	Yard Waste Diversion	All	Sustainability Coordinator
GREEN INFRASTRUCTURE STRATEGY		CITIES	RESPONSIBILITY
GI-1. Green Infrastructure			
GI-1.1	Urban Forest Program	All	Sustainability Coordinator; Community Development

Note:
¹ The designation of All Cities includes Dixon, Fairfield, Rio Vista, and Suisun City

Program Evaluation and Evolution

The CAP represents the city’s initial attempt to create an organized, communitywide plan to reduce GHG emissions. City staff would need to evaluate the plan’s performance over time, and be ready to alter or amend the plan in the future if it is not on track to achieve its reduction targets.

PROGRAM EVALUATION

Two types of performance evaluation are important:

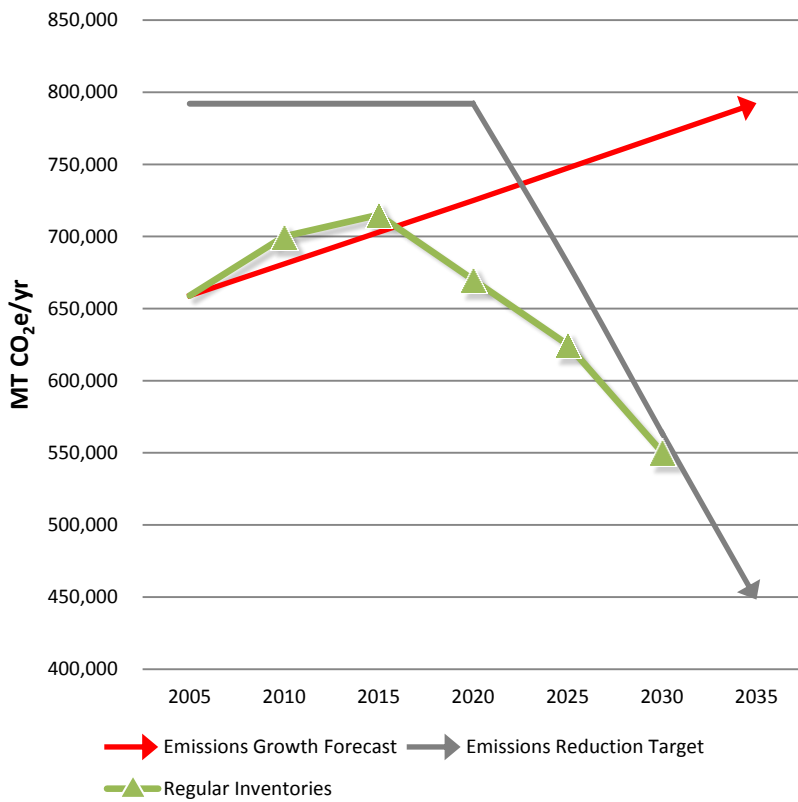
- (1) Evaluation of the community’s overall ability to reduce GHG emissions, and
- (2) Evaluation of the performance of individual CAP measures.

GHG Inventory Updates

Regular communitywide GHG emission inventories provide the best indication of CAP effectiveness. It would be important to reconcile actual growth in the city versus the growth projected when the CAP was developed. Conducting these inventories periodically would enable direct comparison to the 2005 baseline inventory and would demonstrate the CAP’s ability to achieve the adopted reduction target.

The Community Development Department, in conjunction with the proposed Sustainability Coordinator, would prepare communitywide inventories every three to five years following adoption of the CAP to assess progress toward the GHG emissions reduction targets. Figure 4.1 gives an example of how regular communitywide inventories could help track progress toward the reduction targets compared to the business-as-usual emissions forecasts. In the hypothetical scenario shown, communitywide emissions actually increase through 2015 before they start declining to achieve the long-term reduction target. This type of communitywide overview is the easiest way to determine if the CAP measures are being effectively implemented.

Figure 4.2 – Example of Future Emissions Inventory Monitoring



Source: AECOM 2014

CAP Measure Effectiveness

While communitywide inventories provide information about overall emission reductions, it will also be important to understand the effectiveness of each measure. Evaluation of the emissions reduction capacity of individual measures would improve staff and decision makers’ ability to manage and implement the CAP. The city can reinforce successful measures and reevaluate or replace under-performing ones. Evaluating measure performance would require data regarding actual community participation.

Applying the Measure Tracking Template

Table 4.2 provides an example of a measure tracking template that could be used to monitor the efficacy of each CAP measure. The table is similar to the measure tables included in Chapter 3, but has been expanded to include phasing and tracking mechanisms. The phasing column allows each responsible department or agency to identify internal timelines for implementing specific action steps. These could be expressed as specific target years or more generally as short-, medium-, and long-term actions. The tracking mechanisms specify how implementation of the progress indicators could be monitored. Similar to the future communitywide inventories, the progress indicators should be evaluated regularly to ensure each measure is on track to achieve its stated emissions reductions. If during the implementation review process a measure is found to be falling short of its performance targets, then additional attention can be given to modifying the implementation strategy. If implementation review indicates that a measure is unable to achieve its stated reduction level, then additional CAP measures could be developed to make up the difference or other measures could be enhanced to increase their reduction potential. For this reason, CAP implementation should be an iterative process to reflect future changes in the city.

Monitoring Statewide Actions

Similar to the local measures described in this CAP, program evaluation should also include monitoring statewide actions addressing climate change; particularly those actions for which an emissions reduction was calculated and counted in the city's progress toward its reduction targets (see Table 2.4 in Chapter 2). The city should work with the Sustainability Coordinator to track implementation of statewide actions to ensure that estimated reductions actually occur. New statewide actions may also be established in the future that could result in additional local emissions reductions. These new actions should be incorporated into a future CAP revision, and would further reduce the burden on implementing local actions.

Reporting Schedule

The proposed Sustainability Coordinator and responsible departments and agencies would evaluate measure performance on the same schedule as the communitywide inventories following adoption of the CAP, and summarize progress toward the GHG reduction target in a report that describes estimated annual GHG reductions in 2020, achievement of performance metrics, participation rates (where applicable), and remaining barriers to implementation.

The proposed Sustainability Coordinator (or delegated city staff) would report progress on the CAP action items to decision-makers on an annual basis. Staff would deliver this report in conjunction with the state-required annual report to the City Council regarding implementation of the city's General Plan. The progress report will include a cursory assessment of progress and implementation of individual CAP measures, including how new development projects have incorporated relevant measures. The progress report will also identify measure gaps and recommend corrections.

Table 4.2
Measure Implementation Tracking Template

MEASURE E-7.1 SOLAR PHOTOVOLTAIC SYSTEMS

Facilitate the voluntary installation of solar PV systems on residential and nonresidential buildings.

Action	Responsibility	Phasing
A Review/revise all applicable building, zoning, and other codes and ordinances to identify and remove potential regulatory barriers to the installation of solar PV or solar hot water systems in residential and nonresidential construction.	Community Development	Establish an internal target date or timeframe for implementing each action. (e.g., Short-Term, Medium-Term, Long-Term, or specific target years)
B Provide priority permitting for building-scale renewable energy projects.	Community Development; Sustainability Coordinator	
C Develop a comprehensive outreach campaign to increase voluntary participation in solar PV installation programs, including a directory of existing rebates/incentive programs, explanation of simple-payback calculations for solar PV systems, and technical assistance. Leverage existing solar PV informational materials from Energy Upgrade California, the California Solar Initiative, and PG&E.	Community Development; Sustainability Coordinator	
D Develop informational materials about the benefits of PPAs offered through independent solar service providers. Post on the Solano County Sustainability Website, and make printed copies available at the Planning Department and Building Division counters.	Community Development; Sustainability Coordinator	

Progress Indicators	Year	Tracking Mechanisms
2,375 single-family units install 4.5kW PV system 9.0 MW capacity installed on nonresidential and multi-family buildings	2020	Collect information from building permit data and analyze to gauge progress towards indicator targets: <ul style="list-style-type: none"> • How many single family homes installed PV systems in each year, and at what total new capacity? • What was the total new installed PV capacity for multi-family and nonresidential buildings in each year? • What was the total new combined installed PV capacity in each year?
3,050 single-family units install 4.5kW PV system 15.5 MW capacity installed on nonresidential and multi-family buildings	2035	

PROGRAM EVOLUTION

To remain relevant, the city must be prepared to adapt and transform the CAP over time. It is likely that new information about climate change science and risk will emerge, new GHG reduction technologies and innovative municipal strategies will be developed, new financing will be available, and state and federal legislation will change. It is also possible that future inventories could indicate that the community is not achieving its adopted target. As part of the evaluations identified above, the city could assess the implications of new scientific findings and technology, explore new opportunities for GHG reduction, respond to changes in climate policy, and incorporate these changes in future updates to the CAP to ensure an effective and efficient program.

Project Consistency with CAP

The CAP identifies both mandatory and voluntary GHG reduction measures that would apply to different types of future projects.

MANDATORY MEASURES

For each of the following mandatory measures, the CAP either reinforces the implementation of current codes, ordinances, and state legislation, or directs changes to the city's codes and ordinances that would result in GHG reductions. All new projects would be required to comply with these codes and ordinances, as applicable:

- + Measure E-5.1: Building Shade Trees
- + Measure E-5.2: Parking Lot Shade Trees
- + Measure W-1.1: SB-X7-7
- + Measure SW-2.4: Construction and Demolition Waste
- + Measure GI-1.1: Urban Green Forest Program

VOLUNTARY MEASURES

The remaining measures are essentially voluntary, relying on assumed levels of community participation to create communitywide GHG reductions. These measures could be tracked to ensure participation rates are reached and that the voluntary measures are being adequately applied to new and existing projects. If not, then additional, more aggressive actions would be necessary to correct shortfalls.

Funding Sources and Financing Mechanisms

This section describes potential funding sources and financing mechanisms that Fairfield could pursue to offset the financial burden of implementing the CAP measures described in Chapter 3. Each measure is accompanied by an analysis of costs and savings, and potential funding sources, financing strategies, and partnership opportunities.

The spectrum of public and private funding options for the measures outlined in this CAP is ever evolving. This section outlines viable funding options that are current, but could eventually become out of date. However, there are general sources of funding that provide the most up-to-date information, including:

- + U. S. Department of Energy (DOE)
- + Environmental Protection Agency (EPA)
- + US Department of Housing and Urban Development (HUD)
- + California Energy Commission (CEC)
- + California Infrastructure and Economic Development Bank

- + Metropolitan Transportation Commission (MTC)
- + Association of Bay Area Governments (ABAG)
- + Pacific Gas & Electric (PG&E)
- + Bay Area Air Quality Management District (BAAQMD)

COSTS + SAVINGS

The city is not the only entity bearing financial responsibility for implementing for CAP measures; there could be a private cost borne by residents and businesses for specific measures. In recognition of this, a costs and savings analysis was performed for each measure to evaluate the cost to the city, as well as potential costs and savings to residents or property owners. A summary of this analysis can be found in Chapter 3, with analytical background information provided in Appendix B. Generally, the implementation costs to the city for the creation of programs, which consist primarily of initial start-up costs and ongoing administration/enforcement costs, range considerably from negligible additional costs to on the order of several hundred thousand dollars.

Measures vary in the distribution of costs. Some measures require only funding from the city or other public entities, whereas others require that residents and businesses contribute. In nearly all measures that require some investment by residents or business owners, there are substantial long-term savings that would allow recuperation of initial investments, as well as other benefits such as improved air quality or publicly-owned spaces such as streetscapes, open spaces, rights-of-way, etc. There are also measures that require no private investment, but generate savings for the resident or business owner.

FUNDING STRATEGY

The CAP would require strategic public funding by the city, regional government agencies, and the state government for capital projects, incentives, outreach/education, and new regulations necessary to achieve the plan's objectives. To decrease costs and improve the plan's efficiency, actions should be pursued concurrently whenever possible. For example, the city should pursue land use and transportation-related actions together during upcoming General Plan updates and in the development of Specific Plans. The city could also look to address water- and wastewater-related measures with the related utilities and agencies (e.g., water districts); inter-agency collaboration would be paramount to the success of the CAP.

Funding sources have not been identified for all actions; however, numerous federal, state, and regional grants are available to assist with funding. More details on these programs and others follow in the subsequent sections.

Additionally, Fairfield should partner with nearby cities and jurisdictions to administer joint programs when feasible. As many businesses in Solano County and the Bay Area are leaders in resource efficiency, renewable energy, and green infrastructure, potential opportunities exist to partner with the private sector to decrease implementation costs. Finally, many of the measures and actions have the potential to be self-financing if properly designed and implemented.

FUNDING AND FINANCING SOURCES

Transportation-Related Incentives and Programs

Many state and regional grant programs are available to fund transportation and infrastructure improvements. The programs listed below represent the current status of the most relevant of these programs. It is, however, important to evaluate the status of a given program before seeking funding, as availability and application processes are updated periodically.

MTC Livable Communities & Housing Incentive Program

The purpose of MTC's Transportation for Livable Communities (TLC) Capital and Planning Program is to support community-based transportation projects that bring new vibrancy to downtown areas, commercial cores, neighborhoods, and transit corridors by enhancing their amenities and ambiance and making them places where people want to live, work, and visit. TLC provides funding for projects that are developed through an inclusive community planning effort, provide for a range of transportation choices, and support connectivity between transportation investments and land uses.

As part of the TLC program, the Housing Incentive Program (HIP) rewards local governments that build housing near transit stops. The key objectives of this program are to:

- + Increase the housing supply in areas of the region with existing infrastructure and services in place
- + Locate new housing where non-automotive transportation options are viable transportation choices
- + Establish the residential density and ridership markets necessary to support high-quality transit service

HIP funds are intended for transportation capital projects that support TLC goals, such as pedestrian and bicycle facilities that connect housing projects to adjacent land uses and transit; improved sidewalks and crosswalks linking housing to a nearby community facility, such as a school or public park; or streetscape improvements that support increased pedestrian, bicycle, and transit activities and safety.

MTC Transit-Oriented Development Policy

To promote cost-effective transit, ease regional housing shortages, create vibrant communities and preserve open space, MTC has adopted a Transit-Oriented Development (TOD) policy that will be applied to transit extension projects in the Bay Area. MTC's TOD policy includes three key elements:

- + Corridor-based performance measures to quantify minimum thresholds of development around transit stations, based on the transit mode; higher thresholds with more capital-intensive modes, such as BART.
- + Aid for funding Station Area Plans (SAPs) to promote a jobs and housing balance, station access, design standards, parking and other amenities based on unique circumstances, and community character.
- + Creation of corridor working groups to bring together local government staff, transit agencies, county congestion management agencies (CMAs) and other

key stakeholders along the corridor to help develop station area plans to meet MTC's corridor-wide land-use thresholds.

As this policy is still in development, the city should keep track of its progress and applicability to the CAP.

BAAQMD Transportation Fund for Clean Air

<http://www.baaqmd.gov/Divisions/Strategic-Incentives.aspx>

The state legislature has authorized BAAQMD to collect a \$4 surcharge on motor vehicle registration, to be used to fund clean air programs in the District' boundaries. These are known as Transportation Fund for Clean Air (TFCA) funds. By law, 40% of the TFCA funds are allocated to the jurisdiction of origin, and are programmed to qualifying projects by the Congestion Management Agency (CMA). BAAQMD releases updated programming regulations on a yearly basis. In the past, Solano BAAQMD funds have gone to projects such as the Solano Napa Commuter Information (SNCI) ridesharing program, electrical vehicle charging station installation, and signal light prioritization for transit vehicles near major transit hubs.

The TFCA program can fund a wide range of project types, including the purchase or lease of clean air vehicles; shuttle and feeder bus service to train stations; ridesharing programs to encourage carpool and transit use; bicycle facility improvements such as bike lanes, bicycle racks, and lockers; arterial management improvements to speed traffic flow on major arterials; smart growth projects; and projects to enhance the availability of transit information.

For 2014, BAAQMD estimates \$150,000 to \$300,000 of TFCA funds available for STA to allocate to qualifying projects. As with other fund sources, STA will evaluate all applications, but anticipates giving priority consideration to projects or programs that are contained in adopted STA countywide plans such as the Alternative Fuels, Bicycle and Safe Routes to Schools plans.

BAAQMD PEV Ready Program

http://www.bayareapevready.org/?doing_wp_cron=1394052429.8200039863586425781250

The Bay Area Plug-in Electric Vehicle Readiness Plan identifies the systems and resources that are needed to support accelerated PEV deployment, infrastructure, investment and readiness in the region. The Plan is the result of a community outreach process and collaboration among local and regional agencies, state and federal funding agencies, members of the California Plug-in Electric Vehicle Coordinating Council, staff from the electric vehicle industry, and other stakeholders that are pursuing numerous avenues to support PEV deployment in the nine-county Bay Area. The Plan highlights strategies and guidance to help the Bay Area achieve the goal of being "PEV Ready"—that is, well positioned to handle large-scale adoption of PEVs over the next 10 years (2013–2023).

The table below shows completed and active PEV readiness programs.

Project Title	Lead & Support Agencies	Incentive Funding		Match Funding	Charging Stations		DC Fast
		Source	Amount (Millions)		Residential Level 2	Nonresidential Level 2	
EVSE Home Charger Rebate Program (Completed June 2013)	ECOality	BAAQMD	\$2.50	N/A	1,500	-	-
		DOE	\$5.00				
ChargePoint America (Completed June 2013)	Coulomb Technologies/ ChargePoint	DOE	\$1.17 ^a	\$1.71 ^a	-	330	-
Reconnect California (Completed August 2013)	Clipper Creek	CEC	\$2.30	\$1.20	-	65	-
Bay Area EV Corridor Project (Completed November 2013)	EV Communities Alliance, ABAG, Local Cities/ Counties	CEC	\$1.49	\$2.60	-	198 ^b	4
		BAAQMD	\$0.40		-		
Local Government EV Projects	Multiple	BAAQMD	\$0.15	\$1.94	-	50	-
		MTC	\$2.80		-		
eFleet: Car Sharing Electrified	City CarShare SFCTA	MTC	\$1.70	\$0.74	-	24 ^c	-
		BAAQMD BACAF/RFG	\$0.53		-		
Tribal Community Sustainable Transportation	Kashia Band of Pomo Indians	MTC	\$0.37	\$0.08	-	6	-
Businesses Deploying EV Infrastructure	Best Buy, McDonald's, Etc.	BAAQMD	\$0.34	\$0.75	-	178	-
DC Fast Charger Program	Various site hosts	BAAQMD	\$1.00	Varies by host	-	-	50
Electric Vehicle Charging Station Project	NRG (settlement w/ CPUC)	n/a	-	\$25.00 ^d	1,650 ^d (minimum)		55
Total (maximum)					2,490	1,511	109

^a Values are estimates based on the total project funding, match funding, and grant funding. ^b There were also 138 L1 charge points installed as part of this program. ^c City CarShare has been installing EVSE through the ChargePoint America program. These charging stations are not included in the total because they are already accounted for in the ChargePoint America line item. ^d To estimate the match funding for the Bay Area, we assumed about 25% of the settlement would be invested here. For the purposes of our EVSE estimates, we assume that 60% of the Make Readies to be deployed by NRG will ultimately be residential Level 2 EVSE and the other 40% will be nonresidential Level 2 EVSE.

ABAG / MTC FOCUS Program: Station Area and Priority Development Area Grants

<http://www.bayareavision.org/initiatives/prioritydevelopmentareas.html>

As outlined in MTC's Transit-Oriented Development Policy, future transit extensions in the Bay Area must be matched by supportive local land use plans and policies. To assist cities in meeting these goals, MTC launched a Station Area Planning grant program in 2005 to fund city-sponsored planning efforts for the areas around future stations and priority development areas identified by ABAG. These station-area and land-use plans are intended to address the range of transit-supportive features that are necessary to support high levels of transit ridership.

CALTRANS Planning Grants

Community Based Transportation Planning (CBTP) grants fund transportation and land use planning that promotes public engagement, livable communities, and a sustainable transportation system (e.g., mobility, access, and safety). The maximum award is \$300,000, and a local match of 20 percent of the grant request is required.

Safe Routes to Schools

Safe Routes to Schools is an international movement focused on increasing the number of children who walk or bicycle to school by funding projects that remove barriers to doing so. These barriers include lack of infrastructure, safety, and limited programs that promote walking and bicycling through education/ encouragement programs aimed at children, parents, and the community. In California, two separate Safe Routes to School

programs are available: the State program referred to as SR2S, and the federal program referred to as SRTS; both fund qualifying infrastructure projects.

Energy-Related Incentives and Programs

Many of the financing and incentive programs relevant to the CAP concern energy infrastructure and conservation. Some of these programs are tied to the ARRA economic stimulus package enacted by Congress in February 2009, and may no longer be available. Access to these funds will be available for a limited period, and the city should seek the most up-to-date information regarding the programs listed below.

Energy Upgrade California

www.energyupgradecalifornia.com/

www.acgreenretrofit.org/

Energy Upgrade California is a program under the State Energy Program (SEP), which is administered by the CEC. The purpose of the Program is to create jobs and stimulate the economy through a comprehensive program to implement energy retrofits in existing residential buildings. The Program will focus on deploying re-trained construction workers and contractors, and youth entering the job market to improve the energy efficiency and comfort of California's existing housing, creating a sustainable energy workforce in the process.

The Association of Bay Area Governments (ABAG) administers this region-wide energy retrofit program for residential home energy retrofits. Across the Bay Area, this program is targeted to achieve energy efficiency upgrades in up to 15,000 single family and 2,000 multi-family residences.

The program is designed to:

- + Establish sets of verifiable retrofit standards for energy efficiency and other green improvements that are easy for building owners and contractors to understand
- + Train contractors to implement these standards in their retrofit projects
- + Create quality assurance procedures to help ensure that retrofit work meets program requirements and performance expectations
- + Offer financing for eligible improvements through California FIRST
- + Bundle potential rebates and other incentives to make them more accessible to property owners
- + Conduct a countywide marketing and public outreach campaign to get the word out to property owners and building industry contractors about best practices for energy efficiency and green retrofits, as well as financing and incentive opportunities.

Flex Your Power

www.fypower.org

Initiated in 2001, Flex Your Power is a partnership of California's utilities, residents, businesses, institutions, government agencies and nonprofit organizations working to save energy. The campaign includes a comprehensive website, an electronic newsletter and blog, and educational materials. The website provides regularly updated

information on financial incentives and technical assistance for energy-efficient appliances, equipment, lighting and buildings. This information is available for residential, commercial, industrial and institutional consumers.

As existing programs evolve and new programs are created, Flex Your Power is a clearinghouse for information. Current incentives listed include:

- + The California Preschool Energy Efficiency Program (CPEEP) provides child care facilities with energy audits and retrofits.
- + The Enhanced Automation Initiative (EAI) pays large commercial and institutional customers to improve energy efficiency of existing building automation systems or energy management systems.
- + The School Energy Efficiency program (SEE) provides cash incentives for installing a variety of energy efficiency measures.
- + The Savings by Design program provides design assistance and financial incentives to commercial, industrial, institutional and agricultural building owners and design teams to promote energy efficient design and construction practices.

California Solar Initiative

www.gosolarcalifornia.org/csi/index.php

The California Solar Initiative (CSI) is the solar rebate program for California consumers who are customers of investor-owned utilities, such as PG&E. The CSI Program pays solar consumers an incentive based on system performance. For existing homes, existing or new commercial, agricultural, government, and non-profit buildings, this program funds both solar photovoltaics (PV), as well as other solar thermal generating technologies. Additionally, for homes and businesses, this program funds solar hot water systems. An additional rebate is available for single-family homes owned by low-income residents or multi-family affordable housing.

The CSI solar incentives differ by customer segment and size, and are intended to encourage high performing systems. There are two types of incentives available through the CSI program: Expected Performance-Based Buydown (EPBB) and Performance-based Incentives (PBI). EPBB is a one time, up-front payment based on an estimate of the system's future performance. For solar projects with a system larger than 30 kW, PBI are monthly payments for 5 years based on actual performance (output) of the system. The incentive rate is based on the incentive type—EPBB or PBI, and the relevant customer segment—residential, commercial or government/non-profit and current incentive step.

The CSI solar thermal hot water program will run for eight years, ending on December 31, 2017. To qualify of the CSI-Thermal rebate amounts differ by customers' system size, class (e.g., residential or commercial) and water heating fuel source (e.g., gas or electric).

California Feed-In Tariff

www.cpuc.ca.gov/PUC/energy/Renewables/hot/feedintariffs.htm

The California feed-in tariff allows eligible customer-generators to enter into 10-, 15- or 20-year standard contracts with their utilities to sell the electricity produced by small renewable energy systems -- up to 3 megawatts (MW) -- at time-differentiated market-based prices. Time-of-use adjustments will be applied by each utility and will reflect the

increased value of the electricity to the utility during peak periods and its lesser value during off-peak periods. These tariffs are not available for facilities that have participated in the California Solar Initiative (CSI), Self-Generation Incentive Program (SGIP), Renewables Portfolio Standard, or other ratepayer funded generation incentive programs, including net-metering tariffs.

For customers generating renewable energy not covered by the CSI or SGIP (e.g., biomass or geothermal) the feed-in tariff is applicable. If customers prefer a long-term contract at a fixed price over a financial incentive paid in the short term, feed-in tariffs may be a beneficial financing tool.

California Energy Commission Energy Efficiency Financing

<http://www.energy.ca.gov/efficiency/financing/index.html>

The California Energy Commission offers low-interest loans for public institutions to finance energy-efficient projects. Interest rates are currently at 3%. Projects with proven energy and/or capacity savings are eligible, provided they meet the eligibility requirements. Examples of projects include:

- + Lighting systems
- + Pumps and motors
- + LED streetlights and traffic signals
- + Automated energy management systems/controls
- + Building insulation
- + Renewable energy generation and combined heat and power projects
- + Heating and air conditioning modifications
- + Waste water treatment equipment

Loans for energy projects must be repaid from energy cost savings within 15 years, including principal and interest (approximately 13 years simple payback for the one percent interest rate funding and approximately 11 years simple payback for the three percent interest rate funding). Simple payback is calculated by dividing the dollar amount of the loan by the anticipated annual energy cost savings.

Only project-related costs, with invoices dated after loans are officially awarded by the Energy Commission at a Business Meeting, are eligible to be reimbursed from loan funds. The final ten percent of the funds will be retained until the project is completed. Interest is charged on the unpaid principal computed from the date of each disbursement. The repayment schedule is up to 15 years and will be based on the annual projected energy cost savings from the aggregated projects.

School Facility Program – Modernization Grants

www.opsc.dgs.ca.gov/Programs/SFProgams/Mod.htm

The School Facility Program (SFP) provides funding assistance to school districts for the modernization of school facilities. The assistance is in the form of grants approved by the State Allocation Board (SAB), and requires a 40 percent local contribution. A district is eligible for grants when students are housed in permanent buildings 25 years old or older and re-locatable classrooms 20 years old or older and the buildings have not been previously modernized with State funds. The modernization grant can be used to fund a large variety of work at an eligible school site including but not limited to air

conditioning, insulation, roof replacement, as well as the purchase of new furniture and equipment.

Infrastructure State Revolving Fund Program

www.ibank.ca.gov/infrastructure_loans.htm

The Infrastructure State Revolving Fund Program provides direct low-cost loans for local governmental public infrastructure projects, including:

- + City Streets
- + City Highways
- + Environmental Mitigation Measures
- + Parks and Recreational Facilities
- + Public Transit
- + Solid Waste Collection and Disposal

Fairfield can consider applying for these low-interest loans to implement a wide range of CAP measures. Though some eligible projects would be considered public projects, other eligible projects are pertinent to specific measures in this CAP. In particular, the transportation- and waste-related measures could seek financing through this program. Loans are available in amounts ranging from \$250,000 to \$10 million per applicant for Tier 1 loans, and \$250,000 to \$2.5 million per applicant for Tier 2 loans (the tier system is based on evaluation of project impact; the greater the project impact, the higher the cap on available funds).

CPUC Self Generation Incentive Program

www.cpuc.ca.gov/PUC/energy/DistGen/sgip/

The CPUC's Self-Generation Incentive Program (SGIP) provides incentives to support existing, new, and emerging distributed energy resources. The SGIP provides rebates for qualifying distributed energy systems installed on the customer's side of the utility meter. Qualifying technologies include wind turbines, fuel cells, and corresponding energy storage systems.

Energy-Related Bond Financing

Qualified Energy Conservation Bonds (QECBs)

A Qualified Energy Conservation Bond (QECB) is a tax credit bond; issuers repay principal on a regular schedule, but generally do not pay interest. Instead, the holder of a QECB receives a federal tax credit in lieu of interest, which may be applied against the bond holder's regular and alternative minimum tax liability. The tax credit amount is treated as taxable interest income to the holder of the bonds. For example, if the tax credit amount is \$100 and the holder is in the 35 percent tax bracket, the credit provides a \$65 benefit to the holder. Under the current program, QECBs must be issued by the end 2010, though this program is likely to be renewed for the foreseeable future.

The proceeds of the QECBs can be used for one or more of the following "qualified conservation purposes":

- + Type I: Capital expenditures incurred for purposes of (i) reducing energy consumption in publicly-owned buildings by at least 20 percent, (ii) implementing green community programs (including the use of loans,

grants, or other repayment mechanisms to implement such programs), (iii) rural development involving the production of electricity from renewable energy resources, or (iv) any qualified facility eligible for the production tax credit under Section 45 of the IRS Code.

- + Type II: Expenditures with respect to research facilities and research grants to support research in: (i) development of cellulosic ethanol or other non-fossil fuels; (ii) technologies for the capture and sequestration of carbon dioxide produced through the use of fossil fuels, (iii) increasing the efficiency of existing technologies for producing non-fossil fuels; (iv) automobile battery technologies and other technologies to reduce fossil fuel consumption in transportation, or (v) technologies to reduce energy use in buildings
- + Type III: Mass commuting and related facilities that reduce the consumption of energy, including expenditures to reduce pollution from vehicles use
- + Type IV: Demonstration projects designed to promote the commercialization of (i) green building technology; (ii) conversion of agricultural waste for use in the production of fuel or otherwise; (iii) advanced battery manufacturing technologies; (iv) technologies to reduce peak use of electricity; or (v) technologies for the capture and sequestration of carbon dioxide emitted from combining fossil fuels to produce electricity
- + Type V: Public education campaigns to promote energy efficiency

Though some eligible projects would be considered public projects, other eligible projects are pertinent to specific measures in this CAP. In particular, the following eligible project types could have broad applicability in funding the measures in this CAP: Type II-(ii) green community programs, Type III mass commuting facilities, and Type V public education campaigns.

Other Climate-Related Programs

CAL FIRE Climate Change Program

Under the authority of the Urban Forestry Act, the Urban Forestry Program offers grants of over \$1 million dollars per year to plant trees, and over \$2.5 million for related forestry projects in urban communities throughout California.

CAL FIRE has identified five forestry strategies for reducing or mitigating GHG emissions, which are:

- + Reforestation to promote carbon sequestration
- + Forestland conservation to avoid forest loss to development
- + Fuel reduction to reduce wildfire emissions and utilization of those materials for renewable energy
- + Urban forestry to reduce energy demand through shading, increase sequestration, and contribute biomass for energy generation
- + Improved management to increase carbon sequestration benefits and protect forest health

These strategies were recognized by the Governor's Climate Action Team reports in 2006 and 2007, and by the Air Resources Board in its Climate Change Scoping Plan.

Climate Corps Bay Area

<http://www.climatecorps-bayarea.org/>

CCBA receives funding to place AmeriCorps members with local governments, public agencies and other nonprofits to work on energy and climate projects. Each CCBA member spends 11 months (1,700 hours of service) working on emissions reductions projects for their site organization. During this term of service, members will directly help communities to reduce their GHG emissions. Members cannot work directly on policy development or policy advocacy efforts. The goal for this program is for participating members to provide direct service to communities by working on projects that:

- + Realize measurable energy saving, clean energy and GHG reduction opportunities
- + Engage community members in activities that yield measurable energy and GHG benefits
- + Increase civic participation in community energy and climate efforts

Partnerships with Private Companies and Other Organizations

Numerous private companies provide renewable energy or green infrastructure. The success of the CAP depends in part on collaboration between these businesses and the city and public. For example, numerous companies are involved in developing electric plug-in auto charging station infrastructure throughout the Bay Area. PG&E also administers numerous energy efficiency and water conservation programs that the city can leverage and help advertise to residents. Solar companies will also be an important asset to the CAP, as the advent of the Power Purchase Agreement (PPA) enables businesses, residents, and the city to install solar panels and access solar power at no cost. Partnering with new and existing businesses, will enable the city to save money and provide the community with the most up-to-date green infrastructure.

Power Purchase Agreements

Renewable energy has become increasingly more accessible and cost-effective due to Power Purchase Agreements (PPAs). In a PPA, a private company or third party installs a renewable energy technology, often solar panels, at no cost to the consumer and maintains ownership of the installed panels, selling customers the power produced on a per kilowatt-hour basis at a contractually-established rate. The rate is lower than what customers pay their utility today, and increases at a fixed percentage (usually 2.5 to 4.0 percent) annually which is typically lower than the rate escalation by the utilities. In addition to installing the panels, the third party monitors and maintains the systems to ensure functionality. The contract period for a PPA is typically 15 years, at which point the third party will either uninstall the panels or sign a new agreement with the building owner. These agreements are ideal for demonstration projects implemented by the city and residents or businesses with interests in reducing the carbon emissions associated with energy consumption in their homes and businesses. This form of financing systems such as solar PV systems is becoming increasingly popular in the Bay Area, with a number of companies specializing in this form of financial transaction.

Energy Savings Performance Contracting

The basic concept of the energy savings performance contract (ESPC) is that an Energy Services Company (ESCO) guarantees the amount of energy saved, and further guarantees that the value of that energy would be sufficient to make the debt service payments as long as the price of energy does not fall below a stipulated floor price. The key benefits of the guaranteed savings include:

- + The amount of energy saved is guaranteed
- + The value of energy saved is guaranteed to meet debt service obligations down to a stipulated floor price
- + The city carries the credit risk
- + A smaller piece of the investment package goes to “buy” money
- + Tax-exempt institutions can use their legal status for much lower interest rates
- + ESCO carries only the performance risk

Typically, an ESPC project would have a simple payback of 10 years or less to allow for the cost of money and other fees to be included in the overall project payback. Lending institutions look for less than 15 years including all fees.

Typical projects include:

- + Energy management systems
- + Interior and exterior lighting
- + Boiler replacement/repair of steam systems
- + High-efficiency HVAC systems
- + LED traffic systems
- + Wastewater treatment plant pumps and motors

There are numerous ESCOs with reliable track records throughout the state. As evidenced by the above project types, the ESPC financing option would be most applicable to municipal operations-related measures in this CAP. If the city were interested in demonstration projects for particular energy savings technologies, this financing mechanism would apply.

Energy Efficiency Mortgages

www.hud.gov/offices/hsg/sfh/eem/energy-r.cfm

Energy Efficiency Mortgages can provide owners additional financing (whether at time-of-sale or upon refinancing) for energy efficiency improvements at discounted interest rates. Energy efficiency upgrades could be chosen that would allow owners to realize a net monthly savings. The goal is to provide capital for energy efficiency upgrades at a discounted interest rate. The Federal Housing Administration (FHA) offers an Energy Efficient Mortgage Loan program. This program helps current or potential homeowners significantly lower their monthly utility bills by enabling them to incorporate the cost of adding energy-efficient improvements into their new home or existing housing. This FHA program eliminates the need for homeowners who are interested in making their home more energy efficient to take out an additional mortgage to cover the cost of the improvements. The improvements can be included in a borrower’s mortgage only if the total cost is less than the total dollar value of the energy that will be saved during its

useful life. The program is available as part of a FHA-insured home purchase or by refinancing a current mortgage loan.

ENERGY STAR, a program under the DOE, offers another energy efficient mortgage option, though it is in its pilot phase and not currently available in California. This program is designed to encourage comprehensive energy efficiency improvements to new and existing homes by increasing the affordability and availability of energy efficiency mortgages for homeowners and homebuyers. These mortgages include the cost of energy efficiency investments in the loans themselves so that borrowers can pay for those investments over the life of their loans, as well as deduct the interest from their federal and State income taxes. One of the key benefits of an ENERGY STAR mortgage is that a borrower can finance energy-saving improvements to their home without paying more than he/she would for a typical mortgage. Following the completion of the pilot phase, this program will be extended to California.

Partnerships with Other Jurisdictions and Organizations

Partnering with neighboring jurisdictions is another key implementation strategy supporting the CAP. Various jurisdictions within Solano County could serve as potential partners in implementing the CAP strategies. The city should seek to partner with appropriate local governments, as identified in the CAP measure implementation sections, other potential partners including:

- + Solano Transportation Agency
- + Metropolitan Transportation Commission (MTC)
- + Association of Bay Area Governments (ABAG)
- + Pacific Gas & Electric (PG&E)
- + BAAQMD
- + Solano Economic Development Corporation
- + Solano Center for Business Innovation
- + Regional water districts
- + California ReLeaf
- + Sustainable Agriculture Education (SAGE)
- + United States Green Building Council (USGBC) – Northern California Chapter

Infrastructure Financing Districts

Local governments can finance a variety of infrastructure, public facilities, and related improvements through Infrastructure Finance Districts (IFDs). In 2014, AB 471 (Atkins) expanded the authority of cities and counties to establish and fund IFDs. An IFD may finance a project or portion of a project that is located in, or overlaps with, a redevelopment project area or former redevelopment project area and use tax increment financing (to the extent available after meeting former redevelopment agency debt and other financial obligations). As part of budget proposal, Governor Brown is proposing legislation to expand the use of IFDs, lower the voter threshold to create the districts from 2/3 to 55%, and allow.

Other Self-Financing Strategies

CAP measures include a range of incentives and regulations to change the community's behavior. It is important that the fees established in the CAP be self-financing. The money raised through the fees would then be used to implement the CAP measures determined to provide the best mitigation results. Fairfield can actively explore opportunities to establish programs that are self-financing and thus sustainable over the long term.

Prospective Funding: Cap and Trade Revenue

Governor Brown has proposed several hundred million dollars in funding for transportation programs that would reduce GHG emissions. These are summarized below. A copy of the Legislative Analyst Office's report with more details is at:

<http://lao.ca.gov/reports/2014/budget/overview/budget-overview-2014.pdf>.

- + Sustainable Communities \$100 million** – The Strategic Growth Council will administer this program in coordination with various departments to implement Sustainable Communities Strategies that improve transit ridership, increase active transportation, provide affordable housing near transit, as well as preserves agricultural lands and supports local planning efforts that promote infill development. A priority will be given to projects in disadvantaged communities.
- + Low Carbon Transportation \$200 million** – The California Air Resources Board will use these funds to accelerate the transition to low carbon freight and passenger transportation, with a priority for disadvantaged communities. These funds will be used to augment the Air Board's existing programs that provide rebates for zero-emission cars and vouchers for hybrid and zero-emission trucks and buses.
- + Transportation Management Programs** – \$100 million for traffic management mobility projects, \$9 million for active transportation projects, and \$5 million for environmental mitigation.
- + Proposition 1B Bond Funds** – \$793 million to support local transit operators.

Bay Area Integrated Regional Water Management Plan – Integrated Regional Water Management Implementation Grant Program

The Bay Area Integrated Regional Water Management Plan (BAIRWMP) program provides grants for a wide range of water resource, and water quality, stormwater management programs and projects that improve the Bay Area's reliable water supply, increase water conservation, and improve stormwater management, among other program objectives. BAIRWMP has prioritized grant requests that address Bay Area priorities related to climate change (mitigation and adaptation). The primary sources of funding for this program are state water bonds.



City of Rio Vista Climate Action Plan

Public Review Draft
April 2014



City of Rio Vista **Climate Action Plan**

Public Review Draft
April 2014

Prepared for:

City of Rio Vista

Consultant to the City:



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CHAPTER I

INTRODUCTION: PLANNING FOR CLIMATE CHANGE



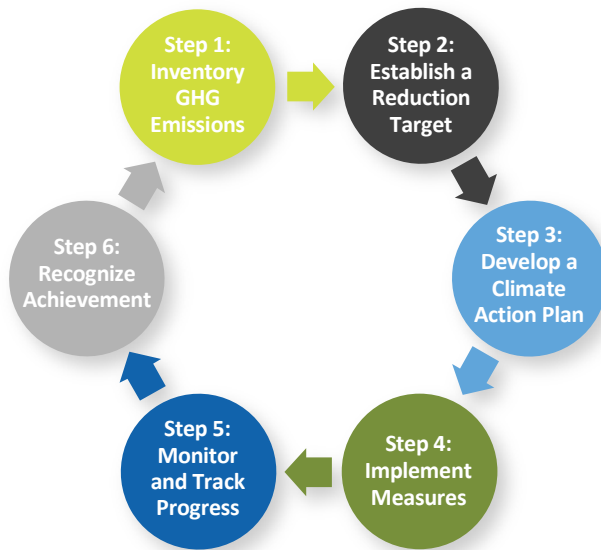
The State of California considers increasing greenhouse gas (GHG) emissions and resulting climate change impacts a major global challenge for the 21st century. According to most climatologists, the planet is starting to experience shifts in climate patterns and increased frequency of extreme weather events at both the global and local levels. At a statewide level, these impacts include reduced snow pack in the Sierra Nevada affecting California water supplies; rising sea levels threatening cities along the coast, San Francisco Bay, and Sacramento River; decreasing air quality affecting public health, particularly in the Central Valley; and, rising temperatures impacting the state's agricultural industry, including Solano County farmers and agricultural businesses.

This plan seeks to address these impacts by increasing local energy independence, improving building energy and water efficiency, supporting alternative transportation options, improving solid waste management, and establishing a regional framework for collaboration. This framework will build from the working relationships established during plan preparation to realize efficiencies in measure implementation among the various jurisdictions within Solano County.

What is a CAP?

A CAP (Climate Action Plan) is a tool that many cities in California are using to quantify their share of statewide GHG emissions and establish action steps toward achieving a local emissions reduction target. A CAP provides a set of strategies intended to guide community efforts to reduce GHG emissions, often through a combination of statewide and local actions. Figure 1.1 shows the typical steps included in the CAP development process.

Figure 1.1 – Steps in the CAP Development Process



A CAP contains community-specific GHG emission inventories and forecasts to establish a starting point and probable future emissions levels if no action is taken (Step 1). A reduction target is then defined to provide an aspirational goal for improvement (Step 2). Emission reduction measures and implementation programs are written to help the city meet its goal by achieving the reduction target (Step 3). Upon adoption of the CAP, the jurisdiction takes action to implement the reduction measures (Step 4), monitor their progress towards achievement of the reduction target (Step 5), then evaluate effectiveness, celebrate their successes, and use the monitoring results to make adjustments to CAP measures to improve performance (Step 6). This CAP represents the city’s progress on Steps 1-3, which are described in more detail below.

Purpose

The climate action planning process seeks to identify measures which are informed by the goals, values, and priorities of the community, while also contributing to the state’s climate protection efforts and complying with any applicable Air Quality District standards for GHG emissions. In addition, the CAP measures are intended to increase community resilience and efficiency of human / economic activities that consume resources which, in turn, lead to greenhouse gas emission (e.g., increasing local energy

independence, reducing transportation-related emissions, improving building energy and water efficiency, and extending the life of area landfills). The CAP can also support regional collaborations among local jurisdictions on climate change issues. There are also California Environmental Quality Act (CEQA) review streamlining benefits for development projects occurring within a jurisdiction that has an adopted CAP.

Context

Many local governments in California are using CAPs to quantify their share of statewide GHG emissions and establish action steps toward achieving a local emissions reduction target. Jurisdictions within Solano County already have a history of taking a leadership role in this area. The cities of Benicia and Vallejo and the County of Solano have already adopted climate action plans. In addition, the City of Vacaville released its Public Review Draft CAP in late 2013 for public review and comment. The City of Rio Vista's (city) efforts are complimentary to those already taken by its neighbors and are part of a regional effort described below.

CAPs typically address emissions targets through reduced dependency on fossil fuels and nonrenewable energy sources, increased energy and water efficiency, land use and technological changes that reduce transportation emissions, and improved waste management strategies. CAPs also provide a way to connect climate change mitigation (GHG reduction) to climate adaptation, community resilience, and broader community goals.

In Rio Vista, GHG emissions come from energy used in buildings, gasoline burned in motor vehicles and power equipment, water and wastewater treatment and conveyance, and solid waste disposal. Rio Vista's CAP examines the communitywide activities that result in GHG emissions and establishes strategies to help reduce those emissions in existing and future development through both voluntary and mandatory actions. The CAP also considers the local impact of federal and statewide actions to reduce GHG emissions.

In addition to reducing greenhouse gases, many of the strategies included in this plan will also help make Rio Vista a more attractive place to live – lowering energy and water bills through conservation, improving circulation through bike and pedestrian facility enhancements, improving air quality, and reducing waste generation to extend the lifetime of local landfills.

Process

This CAP was prepared as part of a Solano County regional-effort, involving the cities of Dixon, Fairfield, Rio Vista, and Suisun City (the participating cities). The intent of preparing this CAP through a regional collaborative process was to establish a common list of reduction measures so that no one jurisdiction would become economically (dis)advantaged through its CAP actions, and to find collaborative opportunities for plan implementation. To that end, the reduction measures contained within Chapter 3 were developed through a collaborative and simultaneous process among the participating cities. The previously adopted CAPs within the county were also reviewed during the measure development process to ensure countywide consistency to the extent possible.

FUNDING

PG&E GREEN COMMUNITIES PROGRAM

The four participating cities, along with the City of Vacaville, received funding through the Pacific Gas & Electric Company's (PG&E's) Green Communities Program to prepare energy efficiency climate action plans. These plans included many components of a full CAP, including evaluation of baseline emissions, future energy use forecasts, target setting, and the development of energy efficiency measures. These draft energy plans were presented to the Planning Commissions of each participating jurisdiction for their review and comment. The resulting information prepared during that effort has been incorporated throughout this full CAP.

STRATEGIC GROWTH COUNCIL PLANNING GRANT

The participating cities also received funding from the Strategic Growth Council (SGC) to develop the remaining non energy-related components of their CAP. This included preparing emissions forecasts for the transportation, solid waste, wastewater, and water sectors, as well as development of reduction measures targeting these sectors. This work was combined with the PG&E-funded draft energy plans to create a comprehensive CAP for each city.

Though similar in many ways, the participating cities each developed a customized CAP, relevant to their community's specific context.

PUBLIC STAKEHOLDER ENGAGEMENT

The project team kept the public, city staff, and elected officials informed and involved during the CAP development process. Stakeholder input was solicited at project milestones through a Regional Technical Advisory Committee (RTAC), at Solano City County Coordinating Council (4C's) meetings, community workshops, and Planning Commission presentations. See Table 1.1 for a list of the public stakeholder engagement activities.

RTAC

The Regional Technical Advisory Committee was formed during the project kick-off phase in June 2012 under the direction of the Solano Transportation Authority. City staff, local business community representatives, and regional agency staff were invited to participate in order to:

- + help gauge project feasibility and success
- + provide feedback on interim documents
- + help make project meaningful and beneficial for all communities
- + review, comment on, and discuss measures and implementation framework
- + support public outreach and future implementation efforts

The RTAC met nine times between June 2012 and October 2013. The first five meetings were committed to development of the PG&E-funded Energy Efficiency CAPs (EECAPs). The last four meetings focused on the SGC-funded portions of the CAPs, as well as

identification of regional implementation opportunities. Table 1.2 lists RTAC members who participated at various points of the CAP development process.

Table 1.1 Public Stakeholder Engagement Overview				
Meeting	Date	Location	Topic/Task	Stakeholders
STA/PGE EECAP Project Kickoff Workshop	June 13-14, 2012	STA Offices	Project kick off and policy gap analysis	City planners, Planning Commissions, City Councils
Community Workshop #1	July 12, 2012	Administration Center	Project kick-off; energy efficiency in participating cities	All
RTAC Meeting #1	July 24, 2012	STA Offices	RTAC kick-off; discuss policy gap analysis	RTAC members
4C's Meeting #1	August 9, 2012	Solano County Water Agency	Overview of project process	4C's Mayors and Supervisors
RTAC Meeting #2	August 28, 2012	STA Offices	Draft actions and measures (Energy)	RTAC members
RTAC Meeting #3	September 25, 2012	STA Offices	Administrative Draft Energy Efficiency CAPs	RTAC members
RTAC Meeting #4	October 23, 2012	STA Offices	Public Review Draft comments	RTAC members
RTAC Meeting #5	November 27, 2012	STA Offices	Planning Commission presentation preparation	RTAC members
Planning Commission Presentations – Energy Efficiency CAPs	November/ December 2012	Dixon, Fairfield, Rio Vista, and Suisun City	Present Draft Energy Efficiency CAPs; discuss next steps	City Planners, Planning Commissions, City Councils, Business Alliance
RTAC Meeting #6	April 16, 2013	STA Offices	Project kick-off for SGC-funded portion of CAPs; overview and schedule	RTAC members
4C's Meeting #2	May 9, 2013	Solano County Water Agency	Target setting and reduction gaps to be addressed by non-energy measures	4C's Mayors and Supervisors
RTAC Meeting #7	May 30, 2013	STA Offices	Preliminary measures list (non-energy), full emissions forecasts, targets and remaining reduction gaps	RTAC members
RTAC Meeting #8	June 18, 2013	STA Offices	Community workshop overview; regional implementation opportunities	RTAC members
Community Workshop #2	June 27, 2013	Solano County Events Center	Presentation of preliminary measures; participation activity to rank CAP measure options; community questionnaire	All
RTAC Meeting #9	October 22, 2013	STA Offices	Review draft measures and actions; discuss gap-filling measures to achieve targets	RTAC members
4C's Meeting #3	November 14, 2013	Solano County Water Agency	Progress report	4C's Mayors and Supervisors
4C's Meeting #4	March 13, 2014	Solano County Water Agency	Presentation of Public Review Draft CAPs	4C's Mayors and Supervisors

**Table 1.2
RTAC Members**

Name	Organization
Michael Neward	Bay Area Air Quality Management District
Alex Porteshawver	City of Benicia
Dave Dowswell	City of Dixon
Erin Beavers / David Feinstein / Brian Miller	City of Fairfield
Dave Melilli / John Degele	City of Rio Vista
John Kearns	City of Suisun City
Tyra Hays	City of Vacaville
Michelle Hightower	City of Vallejo
Dave Hunt	Gymboree
Chuck Rieger	Solano Center for Business Innovation
Matt Walsh	Solano County
Sandy Person	Solano Economic Development Corporation
Chris Lee / Any Floreno / David Okita	Solano County Water Agency
Mona Babauta	Soltrans Ride
Mathew Ehrhardt	Yolo Solano Area Air Quality Management District

4Cs

The Solano County Board of Supervisors and the mayors of the seven Solano County cities comprise the Solano City County Coordinating Council (CCCC) or “4Cs”, whose purpose is to improve countywide communication and coordination on issues of regional importance. The project team attended four meetings with the 4Cs to give CAP status updates and receive input to define the project’s regional approach.

PUBLIC WORKSHOPS

Two public workshops were held to gather community input on the initial list of CAP reduction measures. The workshops were open to all county residents and broadly advertised in local media, on STA’s website, and through email announcements distributed through local email lists from participating city staff. Flyers were also posted at the Solano County Administrative Center, where the workshops were held, and in downtown Fairfield. The first workshop in July 2012 focused on the energy efficiency plans, while the second in June 2013 included discussion of all emissions sectors. At both workshops, the public was encouraged to fill out a survey and talk to city staff representatives about the CAP specifics of each city. Even though some community members questioned the need to reduce GHGs, overall feedback for the effort to increase efficiencies was positive and the survey responses showed that many community members are already actively supporting resource conservation by composting and making efforts to conserve energy. PG&E staff attended the workshops to provide information on available energy efficiency programs and resources. The project team also presented an overview of the CAP planning process and facilitated a

question and answer session. Community members were given another chance to comment at the Planning Commission and City Council meetings where the Draft Energy Efficiency CAPs (in 2012) and the Public Review Draft CAPs (in 2014) were presented.

Scope and Content of the Climate Action Plan

The CAP consists of four chapters: 1) Introduction: Planning for Climate Change; 2) Baseline Emissions Inventory, Forecasts, and Targets; 3) Emissions Reduction Measures; and 4) Benchmarks and Implementation. Appendices A through D provide additional detail on topics covered within the plan. The contents of each chapter and appendix are briefly described below.

- + **Chapter 1, Introduction: Planning for Climate Change**, describes the city's rationale for preparing a CAP, as well as the goals of the CAP to comply with local Air Quality Management District guidelines, as applicable. This chapter provides an overview of the topics covered in the CAP, presents conventional climate change science findings, and describes statewide actions to address climate change. This chapter also introduces the CAP's relationship to General Plan Environmental Impact Reports (EIRs), and its ability to enable a CEQA tool known as "tiering" to allow consistent future discretionary development projects to skip certain steps in the traditional CEQA process.
- + **Chapter 2, Baseline Emissions Inventory, Forecasts + Targets**, outlines key steps taken to develop the CAP, including preparing the 2005 baseline GHG inventory, forecasting future emissions for 2020 and 2035, and setting a near-term communitywide GHG reduction target for 2020 and a long-term target for 2035. This chapter also describes the emissions gap between the reduction targets and estimated statewide reductions.
- + **Chapter 3, Emissions Reduction Measures**, presents local measures developed for the five main reduction strategy areas: energy, transportation and land use, solid waste, water, and green infrastructure. This chapter provides a description of the reduction measure development process. Each local measure also includes a description of existing related programs and accomplishments, measure implementation actions, performance metrics against which to measure success, and estimated GHG reductions in 2020 and 2035.
- + **Chapter 4, Benchmarks and Implementation**, describes the process to monitor progress towards achieving the city's GHG reduction targets. This chapter identifies monitoring procedures, plan update processes, and other steps to ensure successful implementation.
- + **Appendix A – Emissions Inventory Methodology** provides a technical description of the methodology used to prepare for the 2005 emission inventory and 2020 and 2035 emissions forecasts.
- + **Appendix B – Target Setting Rationale** provides background information describing how the 2020 and 2035 reduction targets were selected.

- + **Appendix C – Emissions Reduction Quantification Methodology** provides assumptions used to determine the GHG emission reductions associated with statewide and local actions.
- + **Appendix D – Economic Analysis** presents documentation to support the measure implementation cost ranges included in Chapter 3.

Climate Change Science

According to the US Environmental Protection Agency, global warming refers to the recent and ongoing rise in global average temperature near Earth's surface, and is caused primarily by increasing concentrations of greenhouse gases in the atmosphere. Global warming is causing climate patterns to change. However, global warming itself represents only one aspect of climate change.

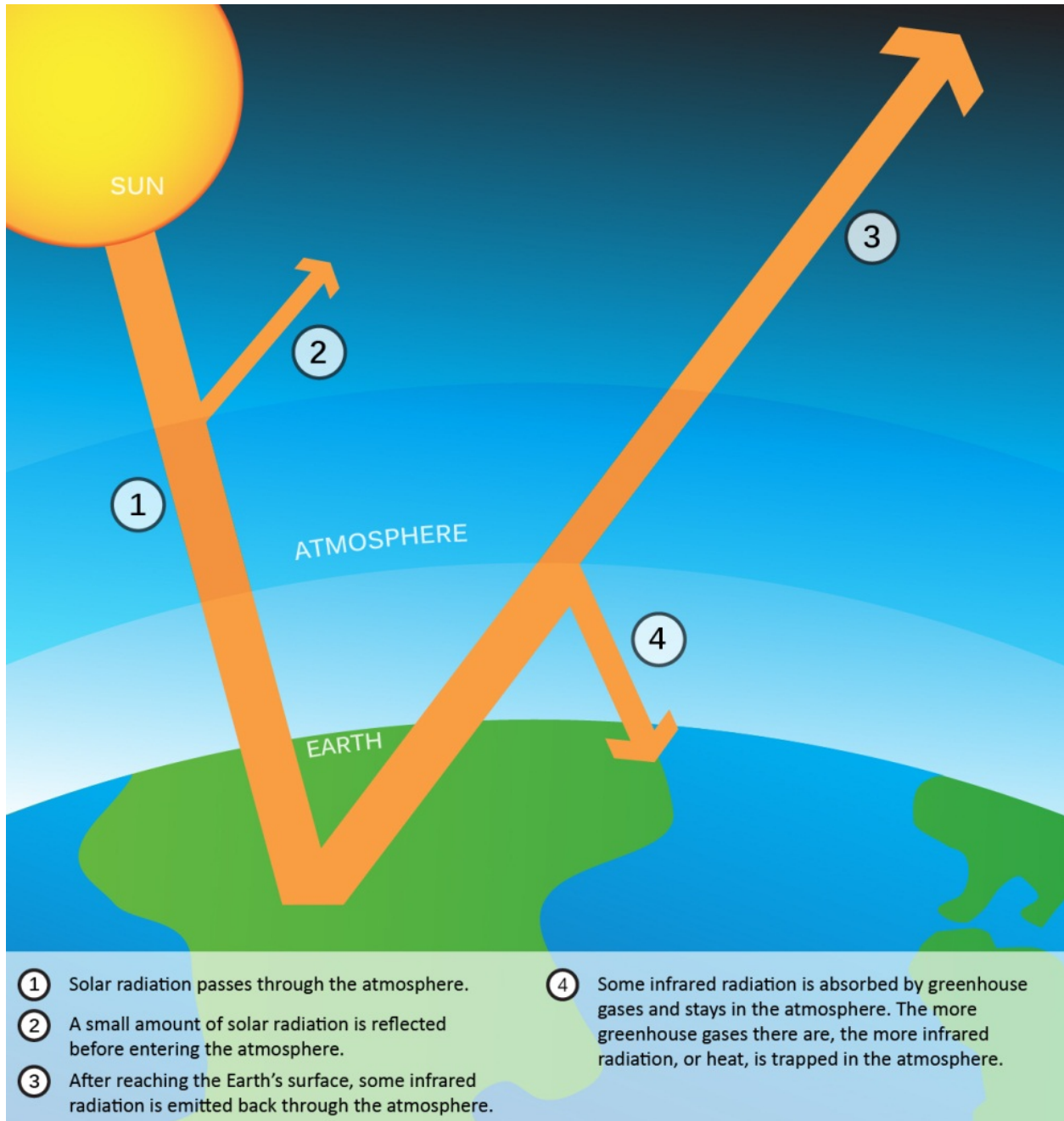
Climate change refers to any significant change in the measure of climate lasting for an extended period of time, including major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer.ⁱ

Over the past century, human activities have released large amounts of carbon dioxide (CO₂) and other greenhouse gases into the atmosphere. Greenhouse gases act like a blanket around Earth, trapping energy in the atmosphere and causing it to warm. This phenomenon is called the greenhouse effect and is natural and necessary to support life on Earth. However, the buildup of greenhouse gases can change Earth's climate and result in dangerous effects to human health and welfare and to ecosystems.ⁱⁱ Figure 1.2 provides a simple illustration of the greenhouse effect.

In the United States, 83.6% of GHG emissions are from CO₂, with 94.4% of CO₂ emissions coming from the burning of fossil fuels.ⁱⁱⁱ Trend projections indicate that atmospheric concentrations of GHG emissions will continue to increase throughout this century. If these projections become reality, climate change will threaten our economic well-being, public health, and environment.

California has an advantage in its scientific understanding of climate change and its local effects. A solid body of vital data is available to assist state and local leaders to better understand how climate change is affecting us now, what is in store ahead, and what we can do about it. State-sponsored research has played a major role in recent advances in our understanding of the potential impacts of climate change on California. A first assessment, published in 2006, made clear that the level of impact is a function of global greenhouse gas emissions and that lower emissions can significantly reduce those impacts.^{iv} The third and most recent publication, *The 2012 Vulnerability and Adaptation Study*, explores local and statewide vulnerabilities to climate change, highlighting opportunities for taking concrete actions to reduce climate-change impacts.^v

Figure 1.2 – Greenhouse Effect



The California legislature passed legislation (addressed below) based upon the findings of the most comprehensive, advanced, and thoroughly reviewed documents on the science of climate change. The development of CAPs in California, including those in Solano County, is based upon the actions of the California legislature and its reliance on these findings. For further information on Climate Science, please visit the California Climate Change Portal at <http://www.climatechange.ca.gov/>.

BENEFITS OF ADDRESSING GHG EMISSIONS

Planning efforts intended to reduce GHG emissions through resource efficiency and conservation measures often have multiple co-benefits as well that will improve the local quality of life. While some co-benefits are qualitative, others are quantifiable improvements over current conditions.

This plan references a list of co-benefits to illustrate the overlapping benefits of various CAP measures, though the list used is in no way exhaustive. Overall, these co-benefits:

- + Strengthen local economic development (e.g., CEQA streamlining/tiering, transparent development requirements)
- + Demonstrate regional sustainability leadership
- + Improve neighborhood experiences
- + Support climate change adaptation strategies and community resilience

The following co-benefits are identified in Chapter 3 next to the applicable local reduction measures:

- + Improves air quality
- + Reduced energy use
- + Promotes regional smart growth
- + Reduces traffic congestion
- + Reduces water use; extends community water supply
- + Improves water quality; reduces stormwater run-off
- + Improves local energy independence
- + Increases natural habitat
- + Reduces heat island effect
- + Improves public health
- + Creates local jobs
- + Reduces waste; extends landfill lifespan
- + Provides long-term savings to residents, businesses, and local governments
- + Raises community awareness

California Climate Change Actions

Rio Vista's strategy for climate protection, as one of eight local plans in the Solano County regional climate action planning effort, must be set within the context of the Bay Area and the State, where much of the momentum for local action in the United States originates.

California has long been a sustainability leader, as illustrated by Governor Schwarzenegger signing Executive Order (EO) S-3-05 in 2005. EO S-3-05 recognizes California's vulnerability to a reduced snowpack, exacerbation of air quality problems, and potential sea-level rise due to a changing climate. To address these concerns, the governor established targets to reduce statewide GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050.

In 2006, California became the first state in the country to adopt a statewide GHG reduction target, through the adoption of Assembly Bill 32 (AB 32). This law codifies the EO S-3-05 requirement to reduce statewide emissions to 1990 levels by 2020. AB 32 resulted in the California Air Resources Board (ARB) adoption of a *Climate Change Scoping Plan* (Scoping Plan) in 2008. The Scoping Plan outlines the state's plan to achieve emission reductions through a mix of direct regulations; alternative compliance mechanisms; and different types of incentives, voluntary actions, market based mechanisms, and funding. The Scoping Plan addresses similar areas to those contained in this CAP, including building energy efficiency, transportation, waste reduction, water conservation, and green infrastructure.

AB 32 engendered several companion laws that can assist Rio Vista in reducing communitywide GHG emissions to achieve its local target. These legislative actions and regulations are referred to as statewide actions throughout this plan, and represent a significant source of estimated GHG reductions. The CAP estimated GHG emission reductions associated with:

- + Renewable Portfolio Standard (RPS),
- + AB 1109 Lighting Efficiency
- + California 2013 Building Energy Efficiency Standards,
- + AB 1493 Pavley I and II
- + EO-S-1-07 Low Carbon Fuel Standard, and
- + Vehicle Efficiency Regulations.

As the regulatory framework surrounding AB 32 grows, it may be possible to evaluate a wider range of statewide reductions.

RENEWABLE PORTFOLIO STANDARD

Senate Bill (SB) 1078, SB 107, EO-S-14-08, and SB X1-2 have established increasingly stringent Renewable Portfolio Standard (RPS) requirements for California utilities. RPS-eligible energy sources include wind, solar, geothermal, biomass, and small-scale hydro.

- + **SB 1078** required investor-owned utilities to provide at least 20% of their electricity from renewable resources by 2020.
- + **SB 107** accelerated the SB 1078 timeframe to take effect in 2010.
- + **EO-S-14-08** increased the RPS further to 33% by 2020. PG&E, Rio Vista's electricity provider, delivered 12.1% of its electricity from RPS-eligible renewable sources in 2005 and 19% in 2011.
- + **SB X1-2** codified the 33% RPS by 2020 requirement established by EO-S-14-08.

AB 1109 – LIGHTING EFFICIENCY

AB 1109 was signed into law in 2007. The California Lighting Efficiency and Toxics Reduction Act requires the California Energy Commission to adopt energy efficiency standards for all general purpose lights, reducing lighting energy usage in indoor residences and state facilities by no less than 50%, by 2018, as well as require a 25% reduction in commercial facilities by that same date. To achieve these efficiency levels, the California Energy Commission applied its existing appliance efficiency standards to include lighting products, as well as required minimum lumen/watt standards for different categories of lighting products. In addition, the bill prohibits the manufacturing for sale or the sale of certain general purpose lights that contain hazardous substances.

2013 BUILDING ENERGY EFFICIENCY STANDARDS

California's Building Standards Code (California Code of Regulations Title 24) dictates how new buildings and major remodels are constructed in California. The Building Energy Efficiency Standards (Title 24, Part 6), are a subset of the state building code, which detail energy efficiency standards for residential and non-residential development. The standards are updated on an approximately three-year cycle. The state has further increased building energy conservation requirements through adoption of the 2013 standards, which go into effect July, 1 2014. It is estimated that these revisions to the current 2008 Building Energy Efficiency Standards will result in energy consumption reductions of 25% over the current standards.

The California Green Building Standards Code (California Code of Regulations Title 24, Part 11) includes additional requirements for new construction and renovation projects that may also result in emissions reductions. This plan does not include these reductions as a separate measure. However, the impact of these requirements may be accounted for in other statewide or local reduction measures (e.g., construction and demolition waste diversion requirements).

NET ZERO ENERGY NEW BUILDINGS

In the *2007 Integrated Energy Policy Report*, the CEC adopted a goal to achieve net zero energy buildings in new residential construction by 2020 and non-residential construction by 2030. A net zero energy building consumes only as much energy on an annual basis as can be generated with an on-site renewable energy system (e.g., solar, wind, geothermal). While the pathway to realize this goal has not yet been defined, this plan considers the future impact of this measure as part of an illustration to show what it will take to achieve the city's longer-term emissions reduction target (see Chapter 3 for further description).

AB 1493 – PAVLEY I AND II

AB 1493, California's mobile-source GHG emissions regulations for passenger vehicles, or California Clean Car Standards, was signed into law in 2002. AB 1493 requires ARB to develop and adopt regulations that reduce GHG emissions from passenger vehicles, light-duty trucks, and other non-commercial vehicles for personal transportation. In 2004, ARB approved amendments to the California Code of Regulations adding GHG emissions standards to California's existing standards for motor vehicle emissions.

EO-S-1-07 – THE LOW CARBON FUEL STANDARD

EO-S-01-07 reduces the carbon intensity of California's transportation fuels by at least 10% by 2020. The Low Carbon Fuel Standard (LCFS) is a performance standard with flexible compliance mechanisms that incentivizes the development of a diverse set of clean, low-carbon transportation fuel options to reduce GHG emissions.

VEHICLE EFFICIENCY REGULATIONS

ARB has adopted several regulations to reduce emissions through improved vehicle efficiency that will have local GHG emission reduction benefits in Rio Vista. The following two regulations were quantified and included as part of this CAP.

TIRE INFLATION REGULATION

On September 1, 2010, ARB's Tire Pressure Regulation took effect. The purpose of this regulation is to reduce GHG emissions from vehicles operating with under-inflated tires by inflating them to the recommended tire pressure rating. The regulation applies to vehicles with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. Under this regulation, automotive service providers must meet the following requirements:

- + Check and inflate each vehicle's tires to the recommended tire pressure rating, with air or nitrogen, as appropriate, at the time of performing any automotive maintenance or repair service.
- + Indicate on the vehicle service invoice that a tire inflation service was completed and the tire pressure measurements after the service were performed.
- + Perform the tire pressure service using a tire pressure gauge with a total permissible error no greater than + two (2) pounds per square inch (psi).
- + Have access to a tire inflation reference that is current within three years of publication.
- + Keep a copy of the service invoice for a minimum of three years, and make the vehicle service invoice available to the ARB, or its authorized representative upon request.

HEAVY-DUTY VEHICLE GHG EMISSION REDUCTION (AERODYNAMIC EFFICIENCY)

This regulation requires existing trucks/trailers to be retrofitted with the best available technology and/or ARB-approved technology to increase vehicle aerodynamics and fuel efficiency that will result in GHG reductions. This measure has been identified as a

Discrete Early Action in the Scoping Plan, which means it must be enforceable beginning in 2010. Technologies that reduce GHG emissions and improve the fuel efficiency of trucks may include devices that reduce aerodynamic drag and rolling resistance. These requirements apply to both California-registered trucks and out-of-state registered trucks that travel to California.

SB 375

The Sustainable Communities and Climate Protection Act of 2008 (SB 375) was adopted to support statewide GHG reduction efforts through coordinated transportation and land use planning. SB 375 seeks to:

- + Use the regional transportation planning process to help achieve AB 32 goals.
- + Use CEQA streamlining as an incentive to encourage transit-oriented residential projects that help achieve AB 32 goals.
- + Coordinate the regional housing needs allocation process with the regional transportation planning process, providing monetary incentives for sustainable development.

Under SB 375, ARB set regional targets for GHG emissions reductions from passenger vehicle use. In 2010, ARB established these targets for 2020 and 2035 for each region covered by one of the State's Metropolitan Planning Organizations (MPO). Each of California's MPOs must prepare a "sustainable communities strategy" (SCS) as an integral part of its regional transportation plan. The SCS contains land use, housing, and transportation strategies that, if implemented, would allow the region to meet its GHG emission reduction targets. The Metropolitan Transportation Commission (MTC) is the MPO for nine Bay Area counties, including Solano County. As such, MTC developed *Plan Bay Area* as its long-range integrated land use and housing strategy, and includes the region's SCS and RTP.

This CAP was developed using household and employment projections from *Plan Bay Area* as well as future travel demand for 2020 and 2035 from MTC's transportation model to provide consistency between the CAP and the SCS. While there are no discrete SB 375 emissions reductions included in the CAP, the transportation emission forecasts were developed using modeled travel data from the SCS, thereby incorporating compliance with SB 375 into the CAP.

Relationship to the General Plan

Whether by local desire, guidance from the State of California, or both, cities and counties are increasingly addressing climate change in their General Plans through the inclusion of policies and programs that have a co-benefit of reducing GHG emissions. The city's policy commitment includes encouraging higher density, mixed-use and infill development in appropriate locations, energy efficiency, and renewable energy development that contribute to GHG reduction strategies contained in the CAP. Since GHG emissions are a cross-cutting issue addressed by many General Plan elements, the CAP as a whole is generally considered an implementation measure for the General

Plan. This structure allows the city to update the CAP on an ongoing, as-needed basis to ensure that their climate protection efforts reflect both current legislation and emerging best practices.

In addition, several state agencies have provided guidance and case studies for local governments to address climate change in their General Plans. For example:

- + Since 2008, the California Attorney General's office has provided guidance to local governments on addressing climate change and greenhouse gas reduction through General Plan policies.
- + The California Office of Planning and Research (OPR) is preparing an update to the state's *General Plan Guidelines* that will include guidance for GHG emissions reduction and climate adaptation.
- + The California Natural Resources Agency has released a Climate Adaptation Policy Guide for local governments.
- + The California Department of Housing and Community Development has released a guidance document on General Plan housing element policies and programs addressing climate change with case study examples.
- + The Office of Planning and Research prepared a guidance document for addressing complete streets in General Plans as required by AB 1358.

Relationship to the California Environmental Quality Act

Local governments may prepare a Plan for Reduction of Greenhouse Gases that is consistent with AB 32 goals. By preparing such a plan, the city can streamline CEQA review of subsequent plans and projects consistent with the GHG reduction strategies and target in the plan. To meet the standards of a qualified GHG reduction plan, Rio Vista's CAP must achieve the following criteria (which elaborate upon criteria established in State CEQA Guidelines Section 15183.5[b][1]):

- + Complete a baseline emissions inventory and project future emissions
- + Identify a community-wide reduction target
- + Prepare a CAP to identify strategies and measures to meet the reduction target
- + Monitor effectiveness of reduction measures and adapt the plan to changing conditions
- + Adopt the CAP in a public process following environmental review

This approach allows jurisdictions to analyze and mitigate the significant effects of GHGs at a programmatic level, by adopting a plan for the reduction of GHG emissions. Later, as individual projects are proposed, project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review in their cumulative impacts analysis. Project-specific environmental documents prepared for

projects consistent with the CAP may rely on the programmatic analysis of GHGs contained in the CAP's corresponding CEQA document. Chapter 4 provides a discussion of the criteria and process the city will use to determine if a future project is consistent with the CAP.

A project-specific environmental document that relies on this CAP for its cumulative impacts analysis must identify specific CAP measures applicable to the project, and how the project incorporates the measures. If the measures are not otherwise binding and enforceable, they must be incorporated as mitigation measures applicable to the project. If substantial evidence indicates that the GHG emissions of a proposed project may be cumulatively considerable, notwithstanding the project's compliance with specific measures in this CAP, an EIR must be prepared for the project.

Notes

ⁱ US Environmental Protection Agency. Climate Change Basics. Accessed December 4, 2012. Available at: <http://www.epa.gov/climatechange/basics/>

ⁱⁱ Ibid

ⁱⁱⁱ US Environmental Protection Agency. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010. April 15, 2012. Accessed December 4, 2012. Available at: <http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html>

^{iv} California Climate Change Center. Our Changing Climate – Assessing the Risks to California: A Summary Report from the California Climate Change Center. August 2006. Accessed December 4, 2012. Available at: <http://www.energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2006-077>

^v California Climate Change Center. Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California. July 2012. Accessed December 4, 2012. Available at: <http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf>

CHAPTER 2

EMISSIONS INVENTORY, FORECASTS + TARGETS

2

This chapter examines Rio Vista’s current and future communitywide greenhouse gas (GHG) emissions. It outlines the first few steps of the CAP development process, including preparing the 2005 baseline GHG inventory, forecasting future emissions for 2020 and 2035, and setting communitywide GHG reduction targets. These first steps are the foundation upon which locally appropriate reduction measures were later developed. This chapter also presents estimated reductions resulting from statewide actions, and compares their impact to Rio Vista’s emissions reduction targets. This comparison frames the reductions gap, which is then addressed through local CAP measures described in Chapter 3.

Baseline Inventory (2005)

The purpose of a baseline inventory is to provide a snapshot of communitywide GHG emissions in a given year. A baseline inventory allows the city to identify major sources of emissions within the community, and then develop meaningful reduction measures that address the major emissions contributors. The city developed its baseline emissions inventory for the 2005 operational year as part of a countywide climate action planning effort in 2011. Although Rio Vista is located within the Yolo Solano Air Quality Management District's (YSAQMD) jurisdictional boundary, at the time of this analysis, YSAQMD had not developed specific GHG inventory guidance. As a result, the City of Rio Vista's inventory was calculated to be consistent with the Bay Area Air Quality Management District's (BAAQMD) GHG Plan Level Quantification Guidance. This approach allowed all of the jointly-prepared GHG inventories and CAPs (i.e., Dixon, Fairfield, Rio Vista, and Suisun City) to be developed in a consistent manner. See Appendix A for the emissions inventory methodology.

EMISSIONS SECTORS

The baseline inventory organizes emissions into categories, or sectors, based on the emissions sources. Rio Vista's inventory includes emissions from the following sectors:

- + Energy (electricity and natural gas)
- + Transportation
- + Solid Waste
- + Off-Road Equipment
- + Potable Water
- + Wastewater

Energy

In general, energy emissions are generated through the combustion of fossil fuels to generate electricity or directly provide power (e.g., natural gas combustion for water heating). The energy sector includes the use of electricity and natural gas in residential, commercial, and industrial land uses within the legal boundaries of the city. Although emissions associated with electricity production are likely to occur in a different jurisdiction, the emissions are considered to be measured at the point of use and not the point of generation. Consumers are thus considered accountable for the generation of those emissions. Electricity-related GHG emissions are considered indirect emissions. Indirect emissions are those that are generated as a result of activities occurring within the jurisdiction, but occur in different geographic areas. For example, a Rio Vista resident may consume electricity within the city, but the electricity may be generated in a different region. Direct emissions are those where the consumption activity directly generates the emissions, such as natural gas combustion for heating or cooling.

The Pacific Gas and Electric Company (PG&E) provides electricity and natural gas to all cities within Solano County, and provided electricity and natural gas consumption data to develop the baseline inventory. PG&E provided all electricity and natural gas consumption data in the form of kilowatt-hours per year (kWh/yr) and therms per year (therms/yr), respectively. Electricity-related GHG emissions were quantified using a

PG&E-specific emission factor that accounts for PG&E's 2005 electricity production portfolio (e.g., the mix of coal, oil, wind, solar and other sources of electricity production). Natural gas GHG emissions were also quantified using a PG&E-specific natural gas emissions factor.

Transportation

Transportation emissions come from vehicle trips that begin and/or end within Rio Vista's boundaries. Pass through trips (for example, non-local drivers on SR-12) are not included within Rio Vista's emissions inventory because the CAP measures would not affect those emissions. This sector includes GHG exhaust emissions from both private vehicles and city-owned vehicles. Unlike most of the other emissions sectors where activity data is available to more precisely calculate actual resource consumption (e.g., electricity used, wastewater generated, solid waste disposed), the transportation sector relies upon travel models to estimate vehicle use within a community. Travel models estimate the total vehicle miles traveled (VMT) within a community, which can then be combined with vehicle fuel emissions factors to estimate transportation-related emissions.

For this CAP, VMT data were acquired from the new Metropolitan Transportation Commission (MTC) activity-based travel model. This model provides VMT data separated by trip origin and destination. The VMT associated with vehicle trips that would originate or terminate within the city were attributed to the city's transportation sector. The MTC model also provides commercial vehicle VMT within a jurisdiction, though calculated differently than the passenger vehicle trips.

Emission factors for the transportation sector were obtained from the California Air Resources Board's (ARB) vehicle emissions model, EMFAC2007. EMFAC2007 is a mobile source emission model for California that provides vehicle emission factors by both county and vehicle class. Solano County-specific emission factors were used in this emissions inventory.

Solid Waste

The solid waste sector includes emissions associated with solid waste disposal. During the solid waste decomposition process, only organic materials release GHGs. Carbon dioxide emissions are generated under aerobic conditions (i.e., in the presence of oxygen), such as when composting. Methane (CH₄) emissions are generated under anaerobic conditions (i.e., in the absence of oxygen), as in many landfill environments. Waste collection and hauling activities also generate GHG exhaust emissions. However, hauling-related emissions are assumed to be included within the MTC commercial vehicle model and represented within the transportation sector.

Solid waste generated within the city is primarily sent to the Hay Road and Potrero Hills landfills. Annual tons of solid waste generated by land uses and waste categorization data were provided by city staff and CalRecycle. The first-order-decay method was used to estimate methane landfill emissions to incorporate the time factor of the solid waste degradation process, which can take decades to occur.

Off Road Equipment

Off-road equipment emissions can come from local construction and mining activities, operation of lawn and garden equipment (e.g., lawn mowers, leaf blowers), and use of light commercial/industrial equipment (e.g., backhoes, forklifts).

Data for construction, mining, light commercial, industrial, and lawn and gardening equipment were obtained from ARB's OFFROAD2007 model, which provides county-level emissions factors for off-road equipment. OFFROAD2007 provides total off-road equipment emissions by county, so applicable indicators specific to Rio Vista were used to allocate the city's share of total county-wide emissions (e.g., building permits, households, retail jobs). Similar to the transportation sector, these emissions are modeled and not based on specific activity data.

Potable Water

The potable water sector includes energy emissions associated with water treatment, distribution, and conveyance. Water consumption data was provided by city staff. The California Energy Commission's water-energy intensity studies were used to calculate the amount of electricity required to provide potable water. GHG emissions associated with potable water supply were then calculated using statewide electricity intensity factors.

Wastewater

The wastewater sector includes emissions resulting from wastewater treatment processes and from energy used to power wastewater treatment plants. City staff provided the total amount of wastewater sent to the Rio Vista Wastewater Treatment Plant from land uses within the city, as well as specific wastewater treatment factors, such as nitrogen content of effluent.

The 2006 International Panel on Climate Change (IPCC) *Guidelines for National Greenhouse Gas Inventories* was used to quantify CH₄ and nitrous oxide (N₂O) emissions resulting from wastewater treatment processes. Generation of both types of emissions depend on the amount of annual throughput (i.e., volume of wastewater), as well as characteristics of the wastewater itself and treatment plant management processes. Energy-related GHG emissions associated with wastewater treatment facility operation were removed from this sector to avoid double counting with the energy sector.

UNITS OF MEASUREMENT

Emissions inventories are commonly expressed in metric tons (or tonnes) of carbon dioxide equivalent per year (MT CO₂e/yr) to provide a standard measurement that incorporates the varying global warming potentials (GWP) of different greenhouse gases. GWP describes how much heat a greenhouse gas can trap in the atmosphere relative to carbon dioxide, which has a GWP of 1. For example, methane has a GWP of 25, which means that 1 metric ton of methane will trap 25 times more heat than 1 metric ton of carbon dioxide, making it a more potent greenhouse gas. Some gases used in industrial applications can have a GWP thousands of times larger than that of CO₂. See Table 2.1 for a sample of common greenhouse gases and their global warming potential.

**Table 2.1
Greenhouse Gases and Global Warming Potential**

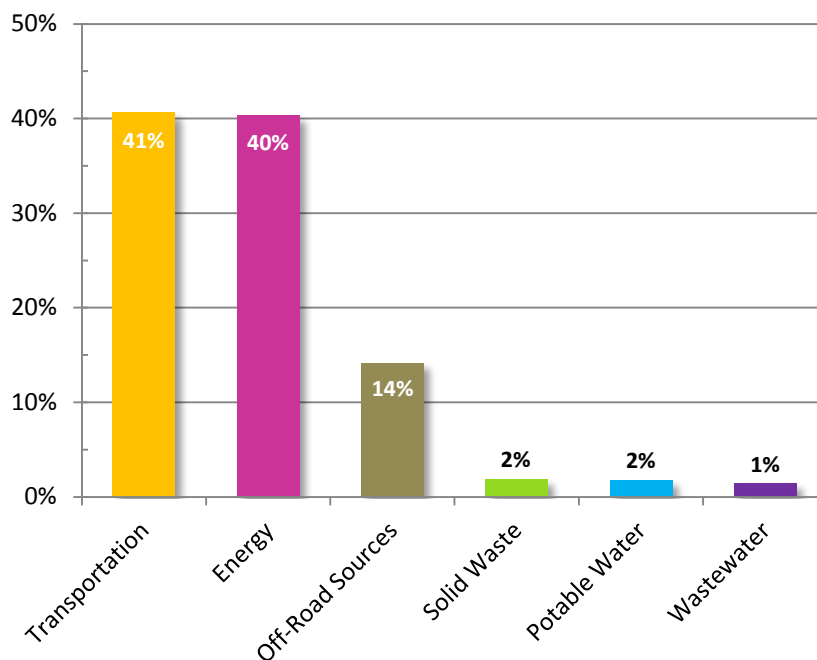
Common Name	Chemical Formula	Global Warming Potential (100-yr)
Carbon Dioxide	CO ₂	1
Methane	CH ₄	25
Nitrous Oxide	N ₂ O	298
Tetrafluoromethane (PFC-14)	CF ₄	7,390
Fluoroform (HFC-23)	CHF ₃	14,800
Sulfur Hexafluoride	SF ₆	22,800

Source: IPCC Fourth Assessment Report, Climate Change 2007¹

BASELINE INVENTORY

Rio Vista’s baseline emissions inventory totals 47,342 MT CO₂e/yr in 2005. As shown in Figure 2.1, the transportation sector is the largest contributor of GHG emissions (41%), with energy use emissions providing a nearly identical contribution (40%). The energy and transportation sectors account for approximately 81% of total emissions, suggesting that local reduction efforts should focus on these areas. Off-road sources make up 14% of the inventory. Solid waste, potable water, and wastewater treatment emissions are all small contributors by comparison, making up the remaining 5% of the inventory. See Table 2.2 for the total emissions from each sector.

Figure 2.1 – 2005 Baseline Emissions by Sector



**Table 2.2
2005 Communitywide Emissions**

Emission Sector	Subsector	Emissions (MT CO2e/year)	Communitywide Total (%)
Transportation		18,156	40.6%
	Passenger Vehicles	15,160	33.9%
	Commercial Vehicles	2,996	6.7%
Energy		18,034	40.3%
<i>Electricity Subtotal</i>		<i>8,229</i>	<i>18.4%</i>
	Residential	4,501	10.1%
	Commercial	3,706	8.3%
	Industrial	22	0.0%
<i>Natural Gas Subtotal</i>		<i>9,805</i>	<i>21.9%</i>
	Residential	7,165	16.0%
	Commercial	2,640	5.9%
	Industrial	0	0.0%
Off-Road Sources		6,298	14.1%
Solid Waste		825	1.8%
Potable Water	Water Demand	779	1.7%
Wastewater	Wastewater Treatment	646	1.4%
Total		44,738	100.0%

Source: AECOM 2013

Note: Columns may not total 100% due to rounding

EMISSIONS FORECASTS – 2020 AND 2035

The baseline inventory was used to project the future communitywide GHG emissions under a business-as-usual (BAU) scenario. Rio Vista’s GHG emissions were forecast for the years 2020 and 2035, assuming that historic trends describing energy and water consumption, travel, and solid waste generation will remain the same in the future. Therefore, emissions forecasts demonstrate what emissions levels are likely to be under a scenario in which no statewide or local actions are taken to curtail emissions growth.

BAU emission forecasts provide insight regarding the scale of reductions necessary to achieve an emissions target before considering reductions likely to result from federal and statewide actions (e.g., vehicle efficiency standards), inherent technological advancements (e.g., energy-efficient appliances, lighting technology), or new voluntary or mandatory conservation efforts (e.g., landscape irrigation restrictions). The BAU emission forecasts also do not anticipate new sources of emissions or increased consumption rates in existing sectors. For example, as use of personal electronics, such as smartphones and tablets, increases emissions from electricity plug-load may also increase. Therefore, the only variable influencing the BAU forecasts is projected population and employment growth within the city.

The BAU forecasts use population and employment growth assumptions established by ABAG in support of Plan Bay Area. For the transportation sector, MTC provided future VMT activity levels using assumptions consistent with the VMT obtained for the baseline

year. The 2020 forecast year aligns with the AB 32 target year, while the 2035 forecast year aligns with the SB 375 planning horizon. These forecasts have been developed for planning purposes, and due to the complexity of each emissions sector and the uncertainty of future population and employment growth within the city, are subject to change. Therefore, as the 2020 and 2035 horizon years approach, the city will reevaluate its emissions projections to incorporate additional data points from periodic emissions inventories and revised city growth estimates. Regular emissions inventory updates will also help to assess progress towards the reduction targets, allowing the city to make revisions to CAP measures as necessary.

Table 2.3 shows Rio Vista’s communitywide emission forecasts by sector for 2020 and 2035. Communitywide emissions are forecast to increase by approximately 3,376 MT CO₂e/yr (7.5%) between 2005 and 2020, and by approximately 6,689 MT CO₂e/yr (15.0%) between 2005 and 2035. See Appendix A for details regarding the emissions forecast methodology.

Table 2.3 Communitywide Emissions 2005-2035					
Emission Sector	2005 Emissions (MT CO ₂ e/yr)	2020 Emissions (MT CO ₂ e/yr)	Increase from 2005 (%)	2035 Emissions (MT CO ₂ e/yr)	Increase from 2005 (%)
Transportation	18,156	20,058	10.5%	22,116	21.8%
Passenger Vehicles	15,160	16,584	9.4%	18,247	20.4%
Commercial Vehicles	2,996	3,474	16.0%	3,868	29.1%
Energy	18,034	18,658	3.5%	19,283	6.9%
<i>Electricity Subtotal</i>	8,229	8,514	3.5%	8,799	6.9%
Residential	4,501	4,657	3.5%	4,813	6.9%
Commercial	3,706	3,834	3.5%	3,963	6.9%
Industrial	22	23	3.5%	24	6.9%
<i>Natural Gas Subtotal</i>	9,805	10,144	3.5%	10,484	6.9%
Residential	7,165	7,413	3.5%	7,661	6.9%
Commercial	2,640	2,732	3.5%	2,823	6.9%
Industrial	0	0	0%	0	0%
Off-Road Sources	6,298	6,516	3.5%	6,734	6.9%
Solid Waste	825	1,408	70.7%	1,772	114.8%
Potable Water	779	805	3.3%	832	6.9%
Wastewater	646	669	3.5%	691	6.9%
Total	44,738	48,114	7.5%	51,427	15.0%

Source: AECOM 2013

Note: Columns may not total 100% due to rounding

Impact of Statewide Actions

Most of Rio Vista’s anticipated emission reductions will come from statewide actions intended to help the state achieve its long-term emissions reduction goals. These actions are being applied throughout California, such as the state’s building energy efficiency standards, and their local impact can be quantified to estimate Rio Vista’s share of these reductions. This CAP assumes that local emissions within the energy and transportation sectors will be reduced through the statewide efforts described in Chapter 1. This includes regulations addressing the use of renewable energy sources, energy efficiency, and GHG emissions from passenger cars and trucks. When the impact of these statewide actions is applied to Rio Vista’s BAU emission forecast, the resulting adjusted business-as-usual (ABAU) emissions levels begin to show progress towards future reduction targets.

This CAP also considers PG&E’s future mix of electricity generation sources as planned through 2020, though this is not specifically a statewide action. In addition to its compliance with the state’s Renewable Portfolio Standard (RPS), PG&E also anticipates that the non-RPS compliant portion of its portfolio will become cleaner as their use of natural gas increases and that of coal decreases. Natural gas releases less CO₂ than coal when burned, which will result in a de-carbonization of PG&E’s electricity generation portfolio as this shift is implemented.

As part of future CAP updates, the city will monitor the effectiveness of state legislation to ensure that the anticipated level of reductions is achieved locally, and to ensure that all applicable statewide reductions are included.

The CAP includes locally-realized emissions reductions from:

- + SB 1078 (Renewable Portfolio Standard) + PG&E’s de-carbonization estimates
- + AB 1109 (Lighting Efficiency)
- + California Title-24 Building Energy Efficiency Standards
- + AB 1493 (Pavley I and II)
- + EO-S-1-07 (Low Carbon Fuel Standard)
- + Vehicle Efficiency Regulations

Including only these statewide initiatives towards the GHG reduction targets is considered a conservative approach because ARB’s Scoping Plan describes numerous other actions that will result in statewide emissions reductions. The actions included herein represent those for which a methodology is available to calculate Rio Vista’s likely share of these reductions. Other actions will provide statewide benefits, but cannot be accurately attributed to Rio Vista at this time, and have therefore been omitted from the CAP’s calculation of statewide actions.

Table 2.4 summarizes the anticipated reductions associated with these statewide actions in years 2020 and 2035. Figure 2.2 shows the trajectory of the BAU and ABAU emissions forecasts from baseline year 2005.

**Table 2.4
2020 and 2035 Emission Reductions from Statewide Actions**

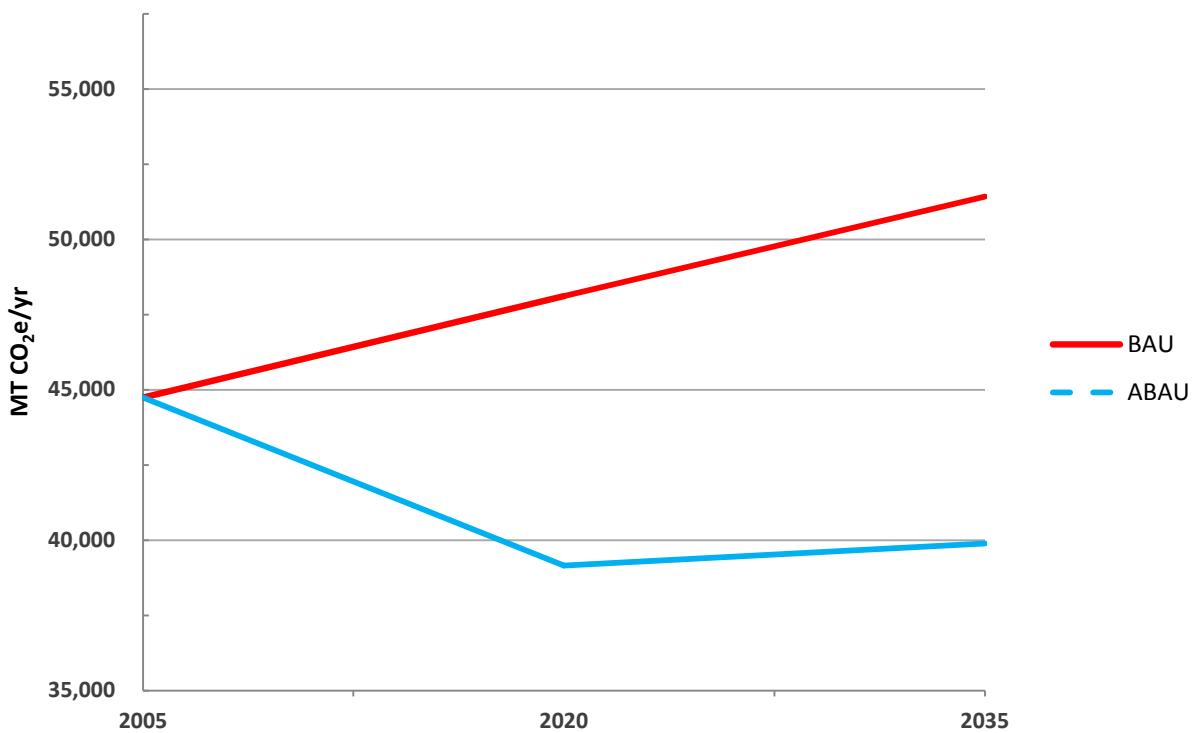
State or Federal Action	2020 Reduction (MT CO ₂ e/year)	2035 Reduction (MT CO ₂ e/year)
Renewable Portfolio Standard (33% by 2020) + PG&E De-carbonization	3,496	3,613
AB 1109 Lighting Efficiency	540	540
2013 California Building Energy Efficiency Standards	138	- ¹
Zero Net Energy Buildings Goal	- ²	510
Pavley I and II	3,411	5,538
Low Carbon Fuel Standard	1,299	1,247
Vehicle Efficiency Regulations	78	86
Total	8,962	11,534

Source: AECOM 2013

¹ Reductions from 2013 Building Energy Efficiency Standards are replaced in 2035 with the CEC's Zero Net Energy Buildings Goal to avoid double counting emissions reductions with overlapping statewide actions;

² The CEC's Zero Net Energy Buildings Goal is intended to take effect beginning in 2020 for residential buildings and 2030 for nonresidential buildings.

Figure 2.2 – Business as Usual (BAU) and Adjusted Business as Usual (ABAU) Emissions



Emission Reduction Targets

The purpose of a reduction target is to enable the city to achieve future GHG emissions reductions in a manner that supports statewide efforts, and complies with recent revisions to the California Environmental Quality Act (CEQA) guidelines to allow CEQA streamlining benefits. See Appendix B for a further description of the target setting rationale presented here.

MASS EMISSIONS AND EFFICIENCY THRESHOLDS

Targets can be expressed as either mass emissions reductions or efficiency thresholds. Mass emissions targets establish an absolute emissions level to be achieved by a target year, such as 100,000 MT CO₂e/yr by 2020. Typically, mass emissions targets are expressed as a percent below the emissions level of some baseline year, such as 15% below 2005 by 2020. Alternatively, efficiency thresholds set a target level of emissions per population or per service population (i.e., population plus local jobs), such as 6.6 MT CO₂e/SP/yr. Efficiency thresholds demonstrate a city's ability to grow population and employment, while emissions shrink on a per unit basis; in effect, a city could be growing more efficiently from an emissions standpoint. In this case, total emissions within a city may increase while still achieving an efficiency target, as long as service population is growing faster than emissions. Both types of targets are useful to consider when selecting an appropriate emissions reduction target for a community.

It is anticipated that the Governor's Office of Planning and Research will provide future guidance regarding preparation of plans for the reduction of GHG emissions. This guidance may identify mass emissions reduction targets as preferable to the use of efficiency metrics at the communitywide planning level, in order to ensure that each jurisdiction in California makes progress towards actual mass emissions reductions. However, at the time of this CAP's preparation there was no state-level guidance requiring local governments to adopt specific reduction targets.

TARGET SETTING CONSIDERATIONS

The city considered a range of GHG emission reduction targets during plan preparation. In making its target selection, the city weighed numerous factors, such as:

- + existing California climate change legislation, direction from ARB, and guidance from California air districts;
- + general understanding of the probable range of GHG reduction opportunities from various types of local and statewide measures;
- + the range of targets and goals set by other Solano County jurisdictions who have completed CAPs; and
- + the feasibility of achieving different GHG targets.

State Legislation and Guidance

The underlying purpose of AB 32 is to take state action that will result in an **absolute reduction** in the atmospheric level of carbon dioxide and other greenhouse gases, which contribute to the impacts commonly associated with climate change. Therefore, the state has set mass emissions reduction targets at the statewide level.

In 2005, Executive Order S-3-05 identified California's vulnerability to the impacts of GHG emissions. The Executive Order established a long-range GHG reduction target of 80% below 1990 levels by 2050. Subsequently, AB 32, the California Global Warming Solutions Act of 2006 was signed, requiring California to reduce *statewide* GHG emissions to 1990 levels by 2020.

AB 32 also directed ARB to develop and implement regulations that reduce statewide GHG emissions. ARB approved *The Climate Change Scoping Plan* (Scoping Plan) in December 2008, which outlines the state's plan to achieve the GHG reductions required in AB 32. The Scoping Plan does not define the specific role local governments, like the City of Rio Vista, will play in meeting the state's GHG reduction goals, but does identify cities and counties as "essential partners" within the overall statewide effort.

However, many local governments do not have sufficient historical data available to prepare a 1990 baseline emissions inventory, which would allow local governments to establish reduction targets that exactly mimic the state's own targets. In the 2008 Scoping Plan, ARB "encourages local governments to adopt a reduction goal for municipal operations emissions and move toward establishing similar goals for community emissions that parallel the state commitment to reduce greenhouse gas emissions by approximately 15 percent from current levels by 2020."ⁱⁱ

Based on this language, many communitywide CAPs select a reduction target of 15% below baseline levels by 2020 to parallel the state's target. Some CAPs also establish a longer-term target to show the city's trajectory towards the state's 2050 goal of 80% below 1990 levels.

California Environmental Quality Act

The City of Rio Vista intends to proactively use the tiering benefits provided under CEQA for communities that have adopted a "... local plan for the reduction or mitigation of GHG emissions" pursuant to SB 97 and State CEQA Guidelines Section 15183.5. If the CAP is prepared in a manner that meets the framework set forth in the CEQA Guidelines, the city can tier from the CAP's CEQA document for the cumulative GHG emissions analysis of future development projects that are consistent with the CAP, eliminating the need for project-specific GHG analysis and mitigation measures.

State CEQA Guidelines Section 15183.5 establishes criteria that a GHG reduction plan, such as Rio Vista's CAP, should meet in order to provide for streamlining of future development projects consistent with the plan. In general, such plans should:

- + Quantify GHG emissions within a defined area,
- + Establish a level where GHG emissions are not cumulatively considerable,
- + Identify emissions from activities covered by the plan,
- + Specify measures to achieve the emissions reduction goal,
- + Monitor progress and amend if necessary, and
- + Be adopted in a public process following environmental review.

Section 15183.5(b)(1)(B) specifically requires that a GHG reduction target must "Establish a level, below which the contribution to [GHG] emissions from activities covered by the plan would not be cumulatively considerable." To comply with this provision within the guidelines, a reduction target must be based on substantial evidence.

Air Quality Management District Guidance

The Yolo-Solano Air Quality Management District (YSAQMD), under whose jurisdiction Rio Vista falls, has not established thresholds of significance for GHG emissions. Several air districts and state agencies (including the Bay Area Air Quality Management District (BAAQMD) and ARB) have established substantial evidence associated with recommended communitywide emissions reduction targets. Since two of the participating cities in this CAP effort are within the BAAQMD jurisdiction, and because YSAQMD has not established its own thresholds of significance for GHG emissions, the participating cities decided to consider BAAQMD's guidance when selecting their reduction targets.

As previously mentioned, the 2008 Scoping Plan presents substantial evidence recommending local agencies seek to reduce communitywide emissions by 15% below current emission levels by 2020. In 2010, BAAQMD also adopted CEQA Air Quality Guidelines that presented substantial evidence for three communitywide emissions reduction targets: 1) 1990 levels by 2020, 2) 15% below current (2008 or earlier) levels by 2020, or 3) use of an efficiency threshold of 6.6 MT CO₂e/yr per service population (i.e., residents plus employees) by 2020. This efficiency threshold is intended to be used only in the context of general or communitywide plans, not individual development projects.

However, BAAQMD's June 2010 adopted thresholds of significance were challenged in a lawsuit, and the Alameda County Superior Court issued a judgment finding in 2012 that the Air District had failed to comply with CEQA when it adopted the thresholds. The court found that the adoption of the thresholds was a project under CEQA and ordered the Air District to examine whether the thresholds would have a significant impact on the environment under CEQA before recommending their use. The court issued a writ of mandate ordering the Air District to set aside the thresholds and cease dissemination of them until the Air District had complied with CEQA. In view of the trial court's order, which remains in place pending final resolution of the case, the Air District is no longer recommending that the thresholds be used as a generally applicable measure of a project's significant air quality impacts.

However, the court did not determine whether the thresholds are or are not based on substantial evidence and thus valid on the merits. Therefore, cities could continue to rely on the substantial evidence based on statewide data and analysis relative to AB 32 that underlies the June 2010 BAAQMD thresholds when making an independent determination of significance of plan-level GHG impacts pursuant to State CEQA Guidelines Section 15064.7(c).

The logic behind BAAQMD's efficiency target is that if all California communities achieved the same level of efficiency on a "fair-share" per service population basis, then the state would achieve its AB 32 GHG reduction goal for 2020. The target metric was calculated by dividing total statewide land use-generated emissions in 2020 by the total population and jobs projected in the state in 2020, as shown in Table 2.5.

Building upon this logic, the project team further refined the efficiency threshold targets, and projected them towards the state's 2050 reduction target at ten-year intervals (with a 2035 target included for consistency with the SB 375 horizon year). Table 2.6 demonstrates the calculation of efficiency level thresholds that were considered as possible targets by the participating cities in development of their CAPs.

Table 2.5
Statewide Efficiency Level Threshold - 2020

	2020 Horizon Year
Population ¹	40,643,643
Employment ²	18,994,360
Service Population (SP)	59,638,003
Emissions Level Target ³	395,830,000 MT CO ₂ e/yr
Emissions per SP	6.6 MT CO ₂ e/SP/yr

Source: Adapted by AECOM, 2013

¹ Population from California Department of Finance 2013 Forecasts

² Employment is from EDD, extrapolated from 2018 estimates to 2020

³ Represents the 2020 horizon year target, which is a return to 1990 emission levels, as represented in the ARB California Greenhouse Gas Inventory for 1990. Includes only the Energy and Waste sectors from the 1990 inventory. The Industrial Processes and Product Use sector and Agriculture, Forestry, and Other Land Use sector were omitted because their emissions are not derived from urban development activities (e.g., residential construction, commercial development).

Table 2.6
Efficiency Threshold Targets through 2050

	2020	2030	2035	2040	2050
Population ¹	40,643,643	44,279,354	46,083,482	47,690,186	50,365,074
Total Employment ²	18,994,360	20,693,470	21,536,609	22,287,484	23,537,564
Total Employment minus Farm, Mining, Logging, Manufacturing ²	17,314,380	18,863,210	19,631,777	20,316,240	21,455,755
Total Service Population	59,638,003	64,972,824	67,620,091	69,977,670	73,902,638
Total Service Population minus Farm, Mining, Logging, Manufacturing	57,958,023	63,142,564	65,715,259	68,006,426	71,820,829
Emissions Level Target ³ (MT CO ₂ e/yr)	264,100,000	193,673,333	158,460,000	123,246,667	52,820,000
Emissions per Service Population (MT CO ₂ e/SP/yr)	4.6	3.1	2.4	1.8	0.7

Source: AECOM, 2013

¹ Population from California Department of Finance 2013 Forecasts

² Employment is from EDD, extrapolated from 2018 estimates to 2020. Then, extrapolated to 2035 based on population to land-use-related job ratio in 2020. Non-farm, mining, logging, manufacturing estimate for 2030 and beyond is based on 2020 ratio between total employment and non-land use employment.

³ Further revisions were made to emissions in the Energy and Waste sectors that were included in Table 2.5. In general, revisions were made to exclude industrial emissions across all sectors, national security emissions, and certain transportation-related emissions, such as aviation and water borne transportation. See Appendix B for further detail on the calculation of this revised 2020 emissions levels. The revised 2020 emissions level then represents a 1990 baseline, which is used to calculate the 2050 emissions level target (i.e., 80% below the 2020 level shown here). Emissions level targets for intermediary years were projected using linear growth calculations.

Local Government Targets in Solano County

The participating cities also considered the GHG emission reduction targets established in adopted or proposed CAPs prepared by other jurisdictions in Solano County, which include:

- + City of Benicia CAP – 10% below 2000 levels by 2020
- + City of Vacaville Draft CAP – 21.7% below 2020 BAU levels by 2020
- + City of Vallejo CAP – 15% below 2008 levels by 2020
- + Solano County CAP – 20% below 2005 levels by 2020

Although different targets and baseline years (or horizon year in the case of Vacaville) are used by each jurisdiction, each of these targets aims to be consistent with the statewide goals of AB 32, and with either the Scoping Plan or more recent ARB statewide projections consistent with the Scoping Plan. In other words, they all meet or exceed AB 32 requirements for 2020. Additionally, none of these jurisdictions have established targets for the 2035 timeframe.

TARGET OPTIONS CONSIDERED

As part of their collaborative CAP development effort, Rio Vista and the other participating cities have chosen to establish 2020 and 2035 targets that meet the following criteria:

- + Are realistic and achievable
- + Consider impacts of statewide and local actions
- + Parallel statewide emissions reduction targets
- + Are based on substantial evidence to allow CEQA streamlining benefits

While adherence to these criteria has resulted in the selection of different targets among the participating cities, mass emissions targets were selected when feasible to demonstrate consistency with the state's absolute emissions reduction efforts (in contrast to an efficiency target as described above). Ultimately, targets were chosen to respond to the unique characteristics of each community while still demonstrating a local contribution to the state's emissions reduction goals.

Mass Emissions Target Option

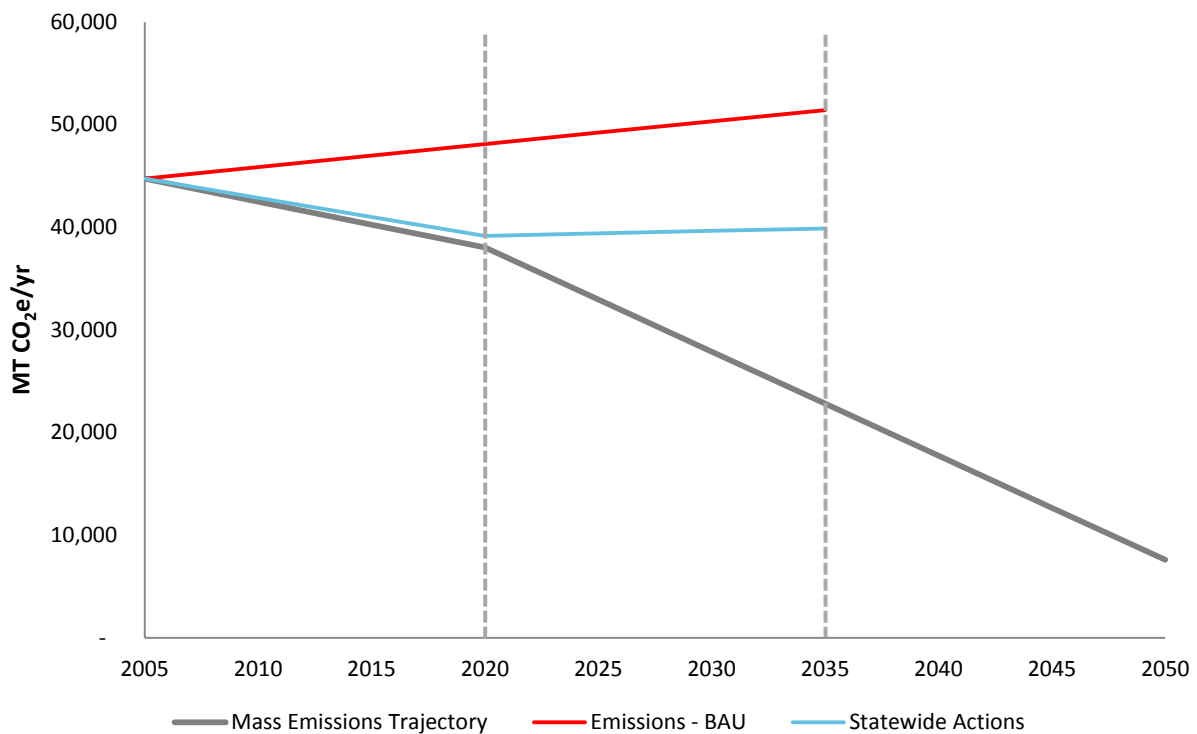
Table 2.7 shows the reductions that would be required in Rio Vista under a mass emissions target for 2020 and 2035. Table 2.7 also shows the reductions contributions attributable to statewide actions, and the remaining emissions reduction gap to be addressed by the local actions presented in Chapter 3. Figure 2.2 illustrates the same information with a red line showing the city's emissions trajectory towards 2035 and a blue line representing ABAU emissions to show the impact of statewide actions. The gray line shows the necessary emissions trajectory to achieve a near-term 2020 target and a longer-term 2050 target, with a dashed line marking an interim 2035 target. The table and figure both show that under a mass emissions reduction scenario, statewide actions would nearly achieve the reduction target in 2020, leaving little work for local CAP actions to do in order to close the gap.

**Table 2.7
Mass Emissions Reduction Targets**

	2005 (MT CO₂e/yr)	2020 (MT CO₂e/yr)	2035 (MT CO₂e/yr)
Inventory and BAU Projections	44,738	48,114	51,427
Reduction Target (2020 and 2035)		38,027	22,816
Reductions Needed to Achieve Target		10,087	28,611
Assumed Statewide Reductions		8,962	11,534
Local Action Reductions Needed to Achieve Target and Goal		1,125	17,077

Source: AECOM 2013

Figure 2.3 – Mass Emissions Reduction Target Option



Efficiency Threshold Target Option

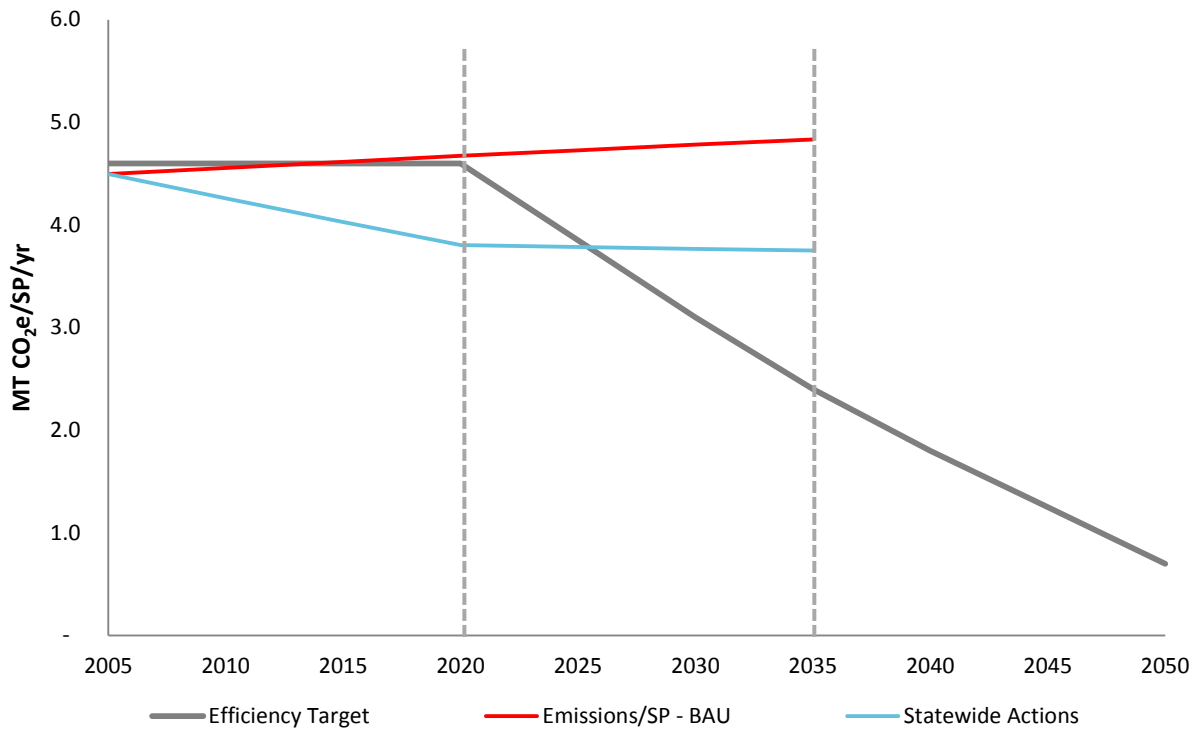
Table 2.8 uses the statewide efficiency targets shown in Table 2.6 as the local emissions targets by applying Rio Vista’s projected service population. As previously described, this type of target could allow mass emissions to increase, while reducing per capita GHG emissions. Table 2.8 shows that under an efficiency threshold approach, the city’s 2020 target would be 4.6 MT CO₂e/SP/yr, while the BAU emissions forecasts are equivalent to 4.7 MT CO₂e/SP/yr. Statewide actions would reduce the emissions forecasts below the target level, indicating that no local actions would be required to achieve the 2020 target. However, as noted above, the participating cities decided to select mass emissions targets when feasible to demonstrate consistency with the state’s absolute emissions reduction efforts.

Table 2.8
Efficiency Threshold Reduction Targets

	2005	2020	2035
Service Population (population + employment)	9,950	10,294	10,639
Inventory and BAU Projections (MT CO ₂ e/yr)	44,738	48,114	51,427
BAU Efficiency Level (MT CO ₂ e/SP/yr)	4.5	4.7	4.8
Efficiency Level Target (MT CO ₂ e/SP/yr)	-	4.6	2.4
Efficiency Level Target (MT CO ₂ e/yr)		47,352	25,534
Reductions Needed to Achieve Target (MT CO ₂ e/yr)		762	25,893
Assumed Statewide Reductions (MT CO ₂ e/yr)		8,962	11,534
Local Action Reductions Needed to Achieve Targets		0	14,359

Source: AECOM 2013
¹ Per Table 2.6

Figure 2.4 – Efficiency Threshold Target Option



RIO VISTA'S EMISSIONS REDUCTION TARGETS

Based on the estimated growth projected in the city through 2035 and each of the target setting considerations described above, Rio Vista has selected the following mass emissions reduction targets for 2020 and 2035:

- + **2020:** 15% below 2005 emissions levels
- + **2035:** 49% below 2005 emissions levels

These targets will allow the city to demonstrate contributions toward statewide absolute emissions reductions, and will provide opportunities for future CEQA streamlining benefits based on the substantial evidence supporting these metrics found in the Scoping Plan and BAAQMD's June 2010 thresholds of significance. These targets are also consistent with those selected by the other participating cities, which further supports the regional collaboration established during plan development. The 2020 target is directly related to the previously described guidance from ARB and BAAQMD, whereas the 2035 target represents consistency with a linear trajectory towards the state's long-term target of 80% below 1990 levels by 2050.

2020 Emissions Reduction Target

Based on the 2005 emissions inventory and 2020 forecasts presented in this chapter, the 2020 communitywide emissions reduction target is 38,027 MT CO₂e/yr (i.e., 15% below 2005 emissions levels). Reductions totaling 10,087 MT CO₂e/yr in 2020 are required to achieve this target. The 2020 statewide reductions identified in Table 2.4 would contribute emissions reductions of 8,962 MT CO₂e/yr. The remaining gap of 1,125 MT CO₂e/yr will be addressed through local actions described in Chapter 3.

2035 Emissions Reduction Target

Achieving the 2035 communitywide emissions reduction target of 22,816 MT CO₂e/yr (i.e., 49% below 2005 emissions levels) would require reductions totaling 28,611 MT CO₂e/yr. Statewide reductions identified in Table 2.4 would contribute 11,534 MT CO₂e/yr, leaving a reductions gap of 17,077 MT CO₂e/yr to be addressed through local actions and additional or enhanced statewide actions.

Notes

ⁱ International Panel on Climate Change. *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007*. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.). [Cambridge University Press](#), Cambridge, United Kingdom and New York, NY, USA. Available at: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

ⁱⁱ California Air Resources Board. *Climate Change Scoping Plan: a Framework for Change*. December 2008. Available at: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf

CHAPTER 3

EMISSIONS REDUCTION MEASURES

3

This chapter describes measures and actions that would be needed to reduce communitywide greenhouse gas (GHG) emissions, and achieve the city's 2020 and 2035 reduction targets. Most measures are designed to achieve quantifiable GHG reductions, while others are listed as supporting measures because they cannot be accurately quantified. To ensure proper implementation, each measure is accompanied by a description providing policy background and implementation details that articulate necessary actions; city departments with primary action responsibility; and progress indicator timelines to track implementation. The city will evaluate effectiveness of CAP measures and actions every three years and propose program modifications if necessary to achieve reduction targets.

Summary of Reductions

Table 3.1 summarizes GHG emission reductions anticipated from implementation of the measures and actions presented in this chapter and the statewide reductions described in Chapter 2. These measures, as well as unquantified supporting measures, are described in detail throughout this chapter to describe how each contributes to emissions reductions and how they will be implemented in Rio Vista. A target achievement discussion is presented at the end of this chapter to show how the city can achieve its 2020 reduction target, and what steps should be taken to put the city on a path towards achievement of longer-term emissions reduction targets.

Table 3.1 Measures and Quantified Reductions			
ENERGY STRATEGY		2020 (MT CO₂e/yr)	2035 (MT CO₂e/yr)
E-1. Existing Buildings			
E-1.1	Energy Efficiency Retrofit Outreach	115	320
E-2. New Construction			
E-2.1	New Construction Energy Efficiency	12	- ¹
E-4. Building Appliances			
E-4.1	ENERGY STAR Appliances	21	50
E-4.2	Smart Grid	83	237
E-5. Building Cooling			
E-5.1	Building Shade Trees	24	49
E-7. Renewable Energy			
E-7.1	Solar Photovoltaic Systems	315	399
E-7.2	Solar Water Heaters	28	163
E-7.4	Community Choice Aggregation	0	- ²
E-8. Street and Area Lighting			
E-8.1	Street Light Upgrade	21	21
E-9. Municipal Actions			
E-9.1	Municipal Renewable Energy Development	34	113
E-9.2	Municipal Building Energy Efficiency	41	44
E-9.3	Wastewater Treatment Plant Process Energy Optimization	171	171
Energy Subtotal		865	1,568
TRANSPORTATION AND LAND USE STRATEGY		2020 (MT CO₂e/yr)	2035 (MT CO₂e/yr)
T-4.1	Alternative Fuel Vehicles	230	- ²
T-5.1	Transportation Demand Management	58	105
Subtotal Transportation and Land Use		288	105

WATER STRATEGY		2020 (MT CO₂e/yr)	2035 (MT CO₂e/yr)
W-1.1	SB X7-7	138	170
Subtotal Water		138	170
SOLID WASTE STRATEGY		2020 (MT CO₂e/yr)	2035 (MT CO₂e/yr)
SW-2.1	Food Scrap and Compostable Paper Diversion	3	76
SW-2.2	Yard Waste Diversion	6	53
SW-2.3	Construction and Demolition Waste	25	90
Subtotal Solid Waste		34	219
GREEN INFRASTRUCTURE STRATEGY		2020 (MT CO₂e/yr)	2035 (MT CO₂e/yr)
GI-1.1	Urban Forest Program	161	328
Subtotal Green Infrastructure		161	328
SUBTOTAL CAP MEASURES		1,486	2,390
STATEWIDE REDUCTIONS			
Renewable Portfolio Standard + PG&E De-Carbonization		3,496	3,613
AB 1109 – Lighting Efficiency Program		540	540
2013 California Building Energy Efficiency Standards		138	³
Zero Net Energy Buildings Goal		⁴	510
Pavley I and II		3,411	5,538
Low Carbon Fuel Standard		1,299	1,247
Vehicle Efficiency Regulations		78	86
Subtotal		8,962	11,534
TOTAL REDUCTIONS		10,448	13,923

Note: Subtotals and totals may not appear to add correctly due to rounding.

¹ Included in 2035 statewide calculation for zero net energy building goal;

² See *Progress toward 2035 Target* discussion at end of chapter for additional detail;

³ Reductions from 2013 Building Energy Efficiency Standards are replaced in 2035 with the CEC's Zero Net Energy Buildings Goal to avoid double counting emissions reductions with overlapping statewide actions;

⁴ The CEC's Zero Net Energy Buildings Goal is intended to take effect beginning in 2020 for residential buildings and 2030 for nonresidential buildings.

Measure Structure

This chapter is organized according to six strategy areas: cross-cutting strategies, energy, transportation, water, solid waste, and green infrastructure. These strategies represent the primary avenues by which to reduce communitywide GHG emissions in Rio Vista. Each strategy area section begins with an introduction to the overarching concepts that tie that particular strategy to GHG emission generation and potential reductions. The strategy overview is followed by the specific measures and actions that translate the city's vision into on-the-ground implementation.

REDUCTION MEASURES

Measures define the programs, policies, and projects that the city will undertake to accomplish its GHG emission reduction goals. Each measure includes information related to GHG reduction potential, opportunities for regional implementation, sustainability co-benefits, and relative magnitude of cost.

REDUCTION POTENTIAL

The estimated annual emissions reduction potential of each quantifiable measure is provided for 2020 and 2035 in MT CO₂e/yr. Some measures have the same reduction potential for both horizon years because the underlying participation assumptions are held constant. Measures identified as "Supporting Measures" contribute to GHG reductions and are an important component of this CAP, but currently lack a methodology to quantify their emissions reduction potential. For example, the proposed sustainability coordinator position described in Measure CC-1.1 is critical to the full implementation of other CAP measures, but it is not possible to accurately calculate the emissions reductions specifically related to that new staff position. Appendix B describes the methodology used to quantify emissions reductions.

ICONS

Graphic icons are used in this chapter to indicate measures that have regional implementation opportunities, sustainability co-benefits associated with the measures, and simple cost estimates for mandatory components of measures. Figure 3.1 presents the icons found throughout this measure.

Regional Efforts

Measures that would benefit from a regional implementation strategy are denoted as Regional Efforts. The four participating cities (i.e., Rio Vista, Dixon, Fairfield, and Suisun City) could collaborate on implementing these measures to reduce overhead costs associated with new program development, or could partner with other regional agencies to create a sustainability coordinator position to oversee CAP implementation.

Co-Benefits

As described in Chapter 1, implementation of these measures will provide additional community benefits beyond their GHG reductions. The icons listed with each measure represent only a sample of the numerous co-benefits related to individual measures.

Cost Analysis

Some CAP measures require residents and local businesses to take action or direct the city government to develop and implement additional programs. Simple cost estimates (i.e., Very Low, Low, Medium, High) for these mandatory actions are provided for informational purposes to help weigh the potential costs and benefits of certain measures. Cost analysis was not performed for measures that describe current and on-going city programs and actions, or voluntary measures that rely on residents and businesses to make personal decisions regarding the importance and value of certain actions. Appendix C provides assumptions used to calculate these simple cost estimates.

Figure 3.1 – CAP Measure Co-Benefits



MEASURE BACKGROUND

The measure background section provides information about the specifics of a measure, including descriptions of various technologies or financing mechanisms. This section also provides information on currently available rebates and other financial incentives related to the measure, and describes any actions the city has taken to date towards implementation of that measure. Additionally, some descriptions provide guidance that will be used in program implementation, such as components of the outreach plan and which segments of the community should be targeted for inclusion.

ACTIONS AND PROGRESS INDICATORS

Action steps and progress indicators are provided in a table following each measure description. Actions identify specific steps that the city will take to implement the measure. The table also identifies responsible departments or agencies that would be best positioned to lead or provide input for implementation of certain tasks. Measures that could be implemented by a regional Sustainability Coordinator, as described in Measure CC-1.1, are identified should the participating cities secure funding for such a position. In most cases, an alternative responsible department is also listed in the event that a sustainability coordinator position cannot be established.

Progress indicators describe the specific action that is being quantified to estimate the reduction potential. These indicators enable city staff, the City Council, and the public to track implementation and monitor overall CAP progress. Progress indicators are provided for both 2020 and 2035, where applicable, and are specifically described when possible with quantified metrics, such as square feet (sq ft) renovated, number of solar hot water heaters installed, or number of employees participating in commute reduction programs. Progress indicators are not provided for supporting measures, which do not have quantifiable emissions reductions.

Reduction Strategies

The strategies identified in this Chapter affect issues within the city's direct influence. Each strategy is subdivided into various sub-strategy headings to help organize the reduction measures. Measures were developed by (a) evaluating existing community conditions, (b) identifying emission reduction opportunities within the community, (c) reviewing best practices from other jurisdictions and organizations, and (d) incorporating State and regional laws, guidelines, and recommendations. Rio Vista's measures were also developed as part of a regional conversation between the cities of Dixon, Fairfield, and Suisun City to provide as much consistency between the four cities CAPs as possible. The adopted CAPs for Solano County and the Cities of Benicia and Vallejo were also reviewed as part of the measure development process to lay the foundation for regional implementation efforts.

The emission reduction strategies are as follows:

- + **Cross-Cutting:** The Cross-Cutting Strategy describes overarching opportunities for regional implementation, but does not include estimates for direct emissions reductions.

- + **Energy:** The Energy Strategy recommends ways to increase energy efficiency in existing buildings, enhance energy performance for new construction, and increase use of renewable energy.
- + **Transportation:** The Transportation Strategy encourages transit, carpooling, walking, and bicycling as viable transportation modes to decrease the need to drive.
- + **Water:** The Water Strategy promotes the efficient use and conservation of water in buildings and landscapes.
- + **Waste:** The Waste Strategy increases waste diversion and recycling, reducing consumption of materials that otherwise end up in landfills.
- + **Green Infrastructure:** The Green Infrastructure strategy suggests ways to enhance the existing urban forest.

Cross-Cutting Strategies

During CAP development, the participating cities identified a need for regional support in the CAP implementation process. Numerous measures were designed to be implemented through collaboration to leverage limited resources and convey a consistent message throughout the county. The following two measures represent this overarching strategy of regional collaboration.

Measure CC-1.1: Sustainability Coordinator

Supporting Measure – Not Quantified

Establish a full-time regional sustainability coordinator to monitor CAP implementation and promote regional sustainability efforts. Explore opportunities to partner with other Solano County governments on this effort (e.g., City of Benicia, Solano County).



Measure Background

Implementation of the following measures described in this CAP will likely require an effort that surpasses the available capacity of existing city staff. Further, numerous measures are identified as “Regional Opportunities” that would benefit from collaboration among the different Solano County governments. Therefore, the participating cities recommended the creation of a regional sustainability coordinator position, which could oversee implementation of CAP measures that rely on regional collaboration.

The sustainability coordinator would act as a liaison between local governments, residents, and businesses in Solano County to implement and track progress of CAP measures and actions. A regional approach would provide implementation efficiencies

on certain measures, and would also help to disseminate best practices information to the local governments regarding other measures. The sustainability coordinator could also act as the point of contact for various regional agencies, including STA, PG&E, the Solano EDC, and the Solano Center for Business Innovation. This would allow one person to gain experience in facilitating implementation of the various programs described throughout this CAP, as opposed to multiple employees of each local government having to coordinate their efforts.

In recent years, several city and county governments have been able to sponsor a full-time sustainability coordinator position through American Reinvestment and Recovery Act (ARRA) grant funding or similar programs. The city will collaborate with other local governments to identify and pursue grant funding to establish a regional sustainability coordinator position.

Action	Responsibility
A Secure funding for regional Sustainability Coordinator position.	Community Development; Solano EDC
B Coordinate with other Solano cities and the county to prioritize regional sustainability issues and programs for joint implementation.	Community Development; Solano EDC

Measure CC-1.2: Public Outreach

Supporting Measure – Not Quantified

Develop coordinated outreach campaign to fulfill the public outreach components recommended throughout this CAP.



Measure Background

Community engagement and effective participation are essential to the successful implementation of this CAP. During the CAP implementation period, the city will conduct outreach programs that involve residents and businesses in various activities, assessments, and actions.

Effective public participation will increase the likelihood that the measures recommended in this plan achieve estimated participation rates. Furthermore, Rio Vista will see higher participation rates if outreach and education programs are adapted over time to meet the changing needs of the community. Increased participation rates will result in increased emissions reductions.

At the start of each fiscal year, the city will work with local stakeholders to determine the outreach priorities of the community, which could be a certain segment of the community (e.g., a group of neighborhoods, the agricultural community, the retail sector) or a specific action (e.g., carpooling, biking, lighting). Outreach priorities should be related to measures described in the CAP. The city will strive to designate at least one outreach event per quarter to address the chosen priority areas. The city could also

designate one week per year to conduct a high-profile outreach campaign targeting a specific measure or strategy area. The campaign week could also be used to recognize community members or businesses that have implemented major improvements.

Numerous measures described in this chapter would benefit from a website that could serve as a central source of information on resource conservation strategies, technical assistance for a variety of topics, and a clearinghouse for rebates and other financial incentives to help implement CAP strategies. The city will work with the Sustainability Coordinator and other local governments to develop a Solano County Sustainability Website that will be a resource for all residents and businesses in the county.

Action	Responsibility
A Work with local stakeholders to determine the CAP outreach priorities for the year.	Community Development
B Designate at least one outreach event per quarter to address the priority areas.	Community Development
C Conduct a high-profile energy efficiency outreach campaign; recognize community members that have implemented major improvements.	Sustainability Coordinator
D Partner with other Solano County governments to develop a county sustainability website.	Sustainability Coordinator

Energy Strategy

As described in Chapter 2, the consumption of electricity for appliances, lighting, and cooling, and combustion of natural gas for heating, cooking, and other processes within residential, commercial, and industrial buildings generated nearly one half of Rio Vista's communitywide GHG emissions in 2005. These emissions can be reduced by improving energy efficiency in new and existing buildings and increasing the amount of electricity and heat generated from renewable energy sources.

In Rio Vista, approximately 40%ⁱ of the housing stock was built before California's energy code, Title 24 Part 6, was first adopted in 1978. Consequently, the building stock offers considerable opportunity for cost-effective energy efficiency retrofits to decrease the use of both electricity and natural gas. The city plans to achieve building energy efficiency improvements in both existing and new buildings through a combination of community outreach and education, incentives, and regulations.

Pacific Gas and Electric Company (PG&E) is Rio Vista's energy utility, providing both natural gas and electricity for residential, commercial, industrial, and municipal uses. PG&E provides electricity generated at hydroelectric, nuclear, renewable, natural gas, and coal facilities. As of 2011, natural gas facilities provided 25%; nuclear plants provided 22% of the total electricity supply; renewable energy facilities including solar, geothermal, and biomass provided 19%; large hydroelectric operations provided 18%; and unspecified sources provided the remainderⁱⁱ. Under the provisions of SB 107 (2006), investor-owned utilities were required to generate 20% of their retail electricity using qualified renewable energy technologies by the end of 2010. In compliance with this mandate, PG&E will expand its renewable generation portfolio, making additional GHG-free electricity available to customers in Rio Vista. In 2011, PG&E delivered 19% of total electricity from eligible renewable sources.

The city will encourage communitywide installation of rooftop solar photovoltaic (PV) and solar hot water systems to increase the portion of Rio Vista's energy portfolio provided from renewable sources. The city will also explore installation of renewable energy facilities on municipal property to increase the generation of renewable energy in the community.

The total GHG emission reduction potential of the Energy Strategy is 865 MT CO₂e/yr in 2020. This represents about 8% percent of total 2020 reductions.

E-1: Existing Buildings

Measure E-1.1: Energy Efficiency Retrofit Outreach

2020 GHG Reduction Potential: **115 MT CO₂e/yr**

2035 GHG Reduction Potential: **320 MT CO₂e/yr**

Encourage voluntary energy efficiency retrofits in residential and nonresidential buildings through promotion of local efforts.



Measure Background

Energy efficiency improvements to residential and nonresidential structures can reduce both energy bills and GHG emissions. Many residences (approximately 69 percentⁱⁱⁱ) in Rio Vista are owner-occupied, and thus the financial savings of home energy efficiency retrofits are in the long term economic interest of the homeowner. As such, the city will emphasize voluntary participation in energy efficiency retrofit programs, in lieu of mandatory programs. As part of the outreach program, the city will enhance its website by linking to information on existing energy efficiency rebates and other financial incentives, including PG&E incentives to businesses for energy efficiency improvements. The website could also contain local case studies of businesses that have completed cost effective energy efficiency improvements.

To encourage participation from residential homeowners, the city will partner with the Solano Center for Business Innovation to leverage Energy Upgrade California's educational materials and online platform that provides access to incentives, technical assistance, and qualified contractors. Typical rebates and incentives available to Solano County residents through Energy Upgrade California include PG&E's Basic and Advanced Retrofit Packages, pool pumps and motor rebates, efficient water heaters/blankets, HVAC upgrades, furnace upgrades, and wall insulation installation. The city will also promote resources such as California Flex Alert, the Department of Energy's (DOE) Weatherization Assistance Program for low-income households, and PG&E's SmartEnergy Analyzer™ program, all of which link residential property owners to educational and financial resources. In addition, PG&E is working to fulfill Goal 2.2 of the CPUC *Long-Term Energy Efficiency Strategic Plan*, which states, "By 2020, 100 percent of eligible and willing customers will have received all cost-effective Low Income Energy Efficiency measures."

Financing is critical to the success of the energy efficiency retrofit program. The city will continue to support the development of a Property Assessed Clean Energy program (see Measure E-3.2) to further promote energy efficiency retrofits. The city will also partner with local real estate professionals to inform homebuyers about the benefits of home energy assessments and the availability of energy efficiency mortgages to finance installation of retrofit packages.

Action	Responsibility
A Develop and maintain a Solano County Sustainability Website with information about current energy efficiency rebates and incentives (including links to PG&E and Energy Upgrade California rebate pages) and local energy efficiency improvement case studies. Leverage Energy Upgrade California outreach and educational materials.	Sustainability Coordinator
B Provide training to Building Division counter staff regarding available sources of rebates/incentives and printed pamphlets or FAQ sheets.	Building Division; Sustainability Coordinator
C Provide targeted outreach to low-income and elderly households with information about the federal weatherization program and statewide Energy Savings Assistance Program, and how improvements can increase occupant comfort levels and reduce utility bills.	Community Development; Sustainability Coordinator

Progress Indicators	Year
100 single-family houses install a comprehensive retrofit package; 275 single-family houses install a basic retrofit package; 15 multi-family units are upgraded with comprehensive retrofit; 30 multi-family units are upgraded with basic retrofit package; 70,000 sq ft of nonresidential area installs a comprehensive retrofit package; 200,000 sq ft of nonresidential area installs a comprehensive retrofit package	2020
275 single-family houses install a comprehensive retrofit package; 800 single-family houses install a basic retrofit package; 40 multi-family units are upgraded with comprehensive retrofit; 85 multi-family units are upgraded with basic retrofit package; 200,000 sq ft of nonresidential area installs a comprehensive retrofit package; 600,000 sq ft of nonresidential area installs a comprehensive retrofit package	2035

Measure E-1.2: Energy Efficiency Assessments

Supporting Measure – Not Quantified

Encourage voluntary energy assessments for residential and nonresidential buildings to identify cost-effective improvements.



Measure Background

The houses in Rio Vista built before adoption of California’s Title 24 energy efficiency requirements are excellent candidates for energy-saving retrofits, which could be identified through energy assessments.

Building energy assessments can help identify and prioritize energy efficiency improvements by providing a building-specific list of retrofit options and their cost-

effectiveness. Additionally, the California Energy Commission (CEC) developed the Statewide Home Energy Rating System (HERS) program to allow comparisons of the efficiency levels between California homes. A home’s HERS rating is calculated as part of an energy assessment, and informs homeowners and renters about energy efficiency much like the MPG metric allows comparisons of vehicles. This type of rating assists in estimating the relative utility costs associated with a home so that renters and buyers can factor those costs into their decision.

The city will partner with the Solano Center for Business Innovation to develop a comprehensive outreach campaign that describes the benefit of energy assessments and available rebates, incentives, and financing options, such as PG&E’s no- or low-cost energy assessment programs for nonresidential customers and residential energy assessment rebates available through Energy Upgrade California. Residential assessments should be performed per the Whole House Energy Rating required by Energy Upgrade California. To help residents finance home energy assessments, the city should pursue grant funding to provide a partial rebate for residents that voluntarily perform energy assessments. Previous sources of funding have included Energy Efficiency Conservation Block Grants (EECBG) and the CEC.

As part of this outreach campaign, the city will identify neighborhoods with concentrations of older homes to help focus the outreach toward buildings that will receive the greatest energy savings. The city will also work with PG&E to identify large-energy users that would benefit from energy assessments and could be eligible for PG&E’s on-bill financing to install retrofit packages identified in the assessment. For these larger energy customers, PG&E offers low- or no-cost energy assessment services that include on-site analysis of energy consuming systems and customized calculations to help create a strategic plan for implementing projects. The city should also partner with local real estate professionals to help educate home buyers about the value of energy assessments at the point of sale. Realtors should also be encouraged to include a home’s HERS rating in the MLS listing.

Action	Responsibility
A Develop a comprehensive outreach campaign that describes the benefit of energy assessments and available rebates, incentives, and financing options.	Solano Center for Business Innovation; Sustainability Coordinator
B Pursue grant funding to provide a partial rebate for residents and businesses that voluntarily perform energy assessments.	Solano Center for Business Innovation; Sustainability Coordinator
C Identify neighborhoods with concentrations of older building stock to focus outreach campaign.	Community Development; Sustainability Coordinator
D Work with PG&E to identify large-energy users that would benefit from energy assessments. Leverage PG&E’s on-bill financing option for nonresidential and municipal customers.	Community Development; Sustainability Coordinator
E Partner with real estate professional groups to help educate home buyers and business owners about the benefits of energy assessments at the point of sale.	Solano Center for Business Innovation; Sustainability Coordinator
F Provide links on the city website to PG&E’s do-it-yourself online energy assessment program. (This information could be placed on a new Solano County Sustainability Webpage to leverage regional efforts.)	Community Development; Sustainability Coordinator

E-2: New Construction

Measure E-2.1: New Construction Energy Efficiency

2020 GHG Reduction Potential: **12 MT CO₂e/yr**

2035 GHG Reduction Potential: *Included in Statewide Reduction
Zero Net Energy Building Goal*

Encourage energy-efficient new construction through promotion of energy-efficient mortgages and technical assistance programs for developers.



Measure Background

California Building Energy Efficiency Standards (Title 24, Part 6, 2008) serve as the basis for mandatory building energy efficiency standards. The California Green Building Standards Code (CALGreen), effective in 2011, also provides the city with the option of adopting an energy efficiency standard that surpasses the State's basic requirements. CALGreen outlines two options: Tier I requires a building's energy performance to exceed Title 24 requirements by 15 percent, while Tier II increases this standard to 30 percent. Revisions to the Title 24 Standards will be adopted in 2013 and will go into effect in 2015.

Although a mandatory ordinance to exceed Title 24 Standards through adoption of the Tier I or II standards will not be established at this time, the city will promote energy efficient new construction through its technical assistance program that provides local builders with information on green building practices, specifically those which relate to energy- and water-efficient design and construction practices. PG&E also developed the Savings by Design program to encourage energy-efficient construction in new commercial buildings. The program offers a range of services to building owners and their design teams, such as design assistance, design team incentives, owner incentives, and educational resources for customized new construction projects that exceed California's Title 24 energy efficiency standards.

To further encourage new construction to participate in this program, the city will provide several green-building incentives described throughout this CAP, such as permit streamlining for installation of various technologies. The city will also consider developing a local green building recognition program to commend building owners that voluntarily exceed Title 24 Standards. The city will work with local real estate professional groups and area developers to provide information to home buyers about the benefits of energy efficiency mortgages, which allow homebuyers to finance the installation of energy efficient systems, such as solar photovoltaics or high-efficiency windows.

Action	Responsibility
A Partner with local developers and realtors to distribute informational brochures about energy efficient mortgages to potential new home buyers.	Building Division; Sustainability Coordinator
B Provide outreach to local developers, architects, and builders on PG&E's Savings by Design program.	Building Division
C Consider establishing a local green-building recognition award for exemplary projects.	Building Division; Sustainability Coordinator

Progress Indicators	Year
15 new single-family residential buildings exceed 2008 Title-24 by 30%	2020

Measure E-2.2: Solar Ready Construction

Supporting Measure – Not Quantified

Require pre-plumbing for solar hot water in all new large-scale residential construction.



Measure Background

Increasing the use of distributed renewable energy systems (e.g., rooftop solar photovoltaic) prevents the combustion of fossil fuels to generate electricity, thereby reducing GHG emissions. Rio Vista's location and geography result in a high solar insolation rating, which makes it an excellent candidate for effective adoption of solar technologies. The city can facilitate future installation of solar technologies by encouraging new construction to be pre-plumbed to support solar hot water systems. This type of front-end addition can reduce the cost of post-construction solar installations for homeowners. The city's technical assistance program described in Measure E-2.1 will provide information on solar-ready construction techniques.

Action	Responsibility
A Update the building code to require pre-plumbing for solar hot water systems in large residential construction projects. Define what types of projects are covered by this measure.	Building Division
B Promote the city's technical assistance program for developers to help implement this measure (see Measure E-2.1).	Building Division

Measure E-2.3: CAP Project Compliance Checklist

Supporting Measure – Not Quantified

Clearly state the city's sustainability requirements for new entitlements in a checklist for use by production builders and developers to demonstrate compliance with the CAP.



Measure Background

One barrier to land development can be a lack of transparency or clear understanding of how to comply with various planning documents. The city will create a CAP compliance checklist to remove uncertainty for developers. The checklist will include features that could be incorporated into a plan prior to entitlement. The city could either identify mandatory features for inclusion that would guarantee entitlement, or could develop a point-based checklist that rates each feature relative to its GHG reduction potential and set a minimum score for entitlement. Checklist items could address a variety of topic areas, including community design and layout, building features, landscaping, and public infrastructure. The checklist should refer builders and developers to the city's technical assistance program for additional information on green design. The city should also meet with local production builders to discuss the city's GHG emissions targets and explain how to use the new checklist.

Action

Responsibility

A	Develop a checklist of new construction requirements per the CAP's measure list. Identify additional, non-mandatory building and design aspects the city would like to encourage.	Community Development; Building Division
B	Consider developing a point-based checklist system whereby a project would receive expedited permitting if it achieved a certain score.	Community Development; Building Division
C	Facilitate group meeting with production builders to discuss GHG emissions targets.	Community Development; Building Division

E-3: Financing

Measure E-3.1: Energy Efficiency Rebate Program

Supporting Measure – Not Quantified

Consider establishing a city or county rebate program to encourage implementation of energy efficiency retrofits.



Measure Background

PG&E currently offers rebates for various home energy efficiency improvements. In addition to PG&E rebates, numerous programs funded by state agencies and local governments are available to Solano County residents through the Energy Upgrade California program. The city will partner with other Solano County governments and agencies to identify gaps in existing rebate and incentive programs and jointly pursue funding to establish a local (e.g., Solano County) rebate program.

New rebates could be structured to encourage residents to buy goods or services from local businesses. For example, the city could develop an ENERGY STAR-rated appliance rebate program to supplement those currently offered through PG&E, by providing an additional \$50 rebate for appliances purchased from local vendors. Alternatively, the new rebate program could be structured to address the building improvement needs of a specific building type, such as small commercial properties or multi-family residential buildings.

Action	Responsibility
A Identify rebate/incentive gaps in PG&E- and Energy Upgrade California-sponsored programs to identify local financing needs.	Community Development; Sustainability Coordinator
B Identify an outside funding source to finance rebate program (e.g., EECBG, ARRA).	Community Development; Sustainability Coordinator

Measure E-3.2: PACE Financing Program

Supporting Measure – Not Quantified

Partner with the county in its pursuit to establish the Clean Energy Solano PACE program that would provide financing options for residential and nonresidential energy efficiency upgrades to existing buildings. Work with other Solano County jurisdictions to jointly pursue bond funding for a commercial PACE program through California FIRST.



Measure Background

A property-assessed clean energy (PACE) finance program is enabled through the AB 811 legislation. This bill allows land-secured loans for homeowners and businesses who install energy efficiency projects and clean-energy generation systems. Senate Bill 555 reinforced implementation opportunities for PACE programs by expanding the scope of activities allowed within a community facilities district, as defined by the Mello-Roos Community Facilities Act of 1982. A PACE program permits property owners within participating districts to finance the installation of energy- and water-efficiency improvements in their home or business through a lien against their property that is repaid through their property tax bill. If the property is sold, payment responsibility transfers to the new owners, allowing building owners to avoid up-front installation costs while at the same time requiring little or no investment of local government general funds. In some instances, the new lender may require repayment of the existing lien, in which case the remaining PACE loan is repaid from the proceeds of the property sale.

Rio Vista is a participating member of the California FIRST program which allows PACE funding for commercial and multi-family residential projects. Rio Vista would also be within the boundaries of the proposed Clean Energy Solano PACE program, which would make financing available to both residential and nonresidential projects.

An initial market analysis for the proposed Clean Energy Solano program estimated 3.5% participation in the first five years from both the residential and nonresidential sectors, which would lead to local economic benefits including approximately \$19 million in state and local tax revenue, the creation of 2,700 new jobs, and the generation of 37 MW of local renewable energy. Furthermore, building owners who participate in the PACE program are not required to front the initial capital costs.

Action	Responsibility
A Opt into the county's PACE program as a participating member.	Community Development; Sustainability Coordinator; Solano EDC
B Develop an outreach program describing available PACE financing options. Work with PG&E to identify large energy users to help focus outreach efforts.	Community Development; Sustainability Coordinator
C Continue to participate in California FIRST to make PACE financing available to commercial, industrial, multi-family residential (5+ units), and nonprofit-owned buildings.	Community Development; Sustainability Coordinator

E-4: Building Appliances

Measure E-4.1: ENERGY STAR Appliances

2020 GHG Reduction Potential: 21 MT CO₂e/yr

2035 GHG Reduction Potential: 50 MT CO₂e/yr

Promote voluntary installation of ENERGY STAR and other high-efficiency appliances.



Measure Background

As Title 24 Standards require building shells and systems to become even more efficient, energy consumption from appliances and electronics will become an increasingly important source for reducing building energy use and residents' utility bills. In 2009, approximately 28% of statewide residential electricity use was dedicated to appliances. Televisions, computers, and home office equipment accounted for an additional 20% of electricity use.^{iv} As big-screen televisions, smart phones, tablets, and other electricity-consuming devices become more commonplace in homes, their proportional share of home electricity use will likely increase as well. Installing ENERGY STAR appliances is one way to reduce energy use in this sector.

This measure is designed to encourage voluntary community participation to upgrade home appliances and lighting to ENERGY STAR or other energy efficient models. Successful implementation of this measure relies on leveraging the Energy Upgrade California program materials through a public outreach campaign to increase community awareness regarding energy efficient appliance choices. The ENERGY STAR rating is an internationally recognized standard for energy efficient consumer products. According to the EPA, devices that have an ENERGY STAR certification, such as office equipment, home appliances, and lighting products, generally use 20 to 30 percent less energy than required by federal standards. By promoting ENERGY STAR-rated home and business appliances, the city can help to reduce GHG emissions related to the use of lighting, refrigerators, dishwashers, clothes washers, wall air conditioning units, computers, photocopiers, lights, and other appliances.

Through Energy Upgrade California, PG&E currently offers rebates to customers who purchase ENERGY STAR dishwashers, clothes washers, refrigerators/freezers, ceiling fans, pool pumps, and room air conditioners. The city will partner with PG&E, Solano County Water District, local developers, and other relevant organizations to promote existing financial incentives and rebates for energy-efficient appliance upgrades and replacements.

Action	Responsibility
A Collaborate with PG&E, Solano County Water District, and other local organizations to promote existing financial incentive programs to encourage voluntary replacement of inefficient appliances with new ENERGY STAR appliances.	Community Development; Sustainability Coordinator
B Provide outreach to local developers regarding sources of available rebates to encourage installation of ENERGY STAR-rated major appliances in new residential construction.	Building Division; Sustainability Coordinator

Progress Indicators	Year
New residential construction installs energy-efficient appliances: 375 refrigerators; 500 clothes washers; 550 dishwashers;	2020
Existing residential units replace expired appliances with energy-efficient appliances: 825 refrigerators; 1,500 clothes washers; 2,100 dishwashers	
New residential construction installs energy-efficient appliances: 450 refrigerators; 600 clothes washers; 675 dishwashers;	2035
Existing residential units replace expired appliances with energy-efficient appliances: 1,400 refrigerators; 2,200 clothes washers; 2,750 dishwashers	

Measure E-4.2: Smart Grid

2020 GHG Reduction Potential: **83 MT CO₂e/yr**

2035 GHG Reduction Potential: **237 MT CO₂e/yr**

Encourage adoption of smart grid-compatible appliances and energy management systems to shift peak-load energy use.



Measure Background

The ‘smart grid’ is an emerging energy management system which uses information technology to significantly improve how electricity is managed and controlled. Smart meters, which use a technology that enables users to take full advantage of the smart grid, will eventually provide utility customers with access to detailed energy use and cost information, new time-of-use pricing programs based on peak-energy demand, and the ability to program home appliances and devices to respond to energy use preferences based on cost, comfort, and convenience.

Current smart meters allow for frequent remote reading of energy usage by PG&E. However, the true value of the smart meter program will be fully realized when community residents and businesses begin making more informed energy use decisions based on the two-way communication enabled by smart meters, such as when a homeowner is able to program their washing machine to run when energy prices are lowest.

All investor-owned utilities are rolling out time-of-use pricing, which offers lower utility rates to customers that switch discretionary energy use to off-peak times. Time-of-use pricing is mandatory for all commercial customers, and will eventually be offered to residential customers as well. PG&E currently offers the SmartRate pricing plan to residential customers, which offers lower prices per kWh to customers that agree to reduce electricity use on “SmartDays” when intense heat drives up air conditioning use and therefore, electricity prices. PG&E has also joined OPower, a social media technology provider that helps customers using smart grid technology to compare their energy use with neighbors. To support use of their various pricing programs, PG&E created the Green Button Connect program to allow customers to share their energy usage data with third-party app developers that already have products to help customers track and manage their energy use. The assumption is that customer access to their own energy use trends will support behavioral changes to energy consumption, which will lower customers’ utility bills and lower PG&E’s costs to provide energy.

When estimating the potential GHG emission reductions associated with implementation of the smart grid, the city included the energy efficiency improvements gained from integrating smart grid energy management systems for control lighting, heating, ventilation, and air conditioning and other major appliances in residential and commercial buildings. According to CISCO, a world-wide leader in network technology, full integration of the smart grid will take time to realize, but energy analysts estimate it will ultimately be capable of reducing electricity-related GHG emissions by 30 percent below current levels.

Through public outreach efforts and targeted outreach to the development community, the city will promote voluntary adoption of smart-grid technology for homes and businesses. The city will train Building Division staff on the benefits of smart-grid integration and provide informational materials on existing rebate programs.

Action	Responsibility
A Develop an outreach program that leverages existing PG&E materials, including description of the O-Power Program. Make information available at Building Division counter.	Building Division; Sustainability Coordinator
B Identify and advertise available rebates for smart-grid compatible appliances and systems on the county’s Sustainability Website.	Building Division; Sustainability Coordinator

Progress Indicators	Year
530 residential units install smart-grid compatible appliances and systems; 435,000 sq ft of commercial area installs smart-grid compatible appliances and systems	2020
1,425 residential units install smart-grid compatible appliances and systems; 835,000 sq ft of commercial area installs smart-grid compatible appliances and systems	2035

Measure E-4.3: Energy Efficient Water Softeners

Supporting Measure – Not Quantified

Promote energy-efficient water softener technologies, such as canister systems, through public outreach and/or incentives.



Measure Background

The city is researching water softener technologies that could reduce the costs associated with salt removal at the city's wastewater treatment plants. The city will provide information on alternatives to the traditional regenerating salt-based water softeners used in many homes. In regenerating systems, salt is added directly to the water supply, where it is carried away in wastewater that requires an energy-intensive removal process at the treatment plant. New water softener systems can provide the same result without the direct application of salt to the water supply. For example, canister exchange systems contain the salt within replaceable canisters, keeping it out of the wastewater system.

The city will explore opportunities to incentivize the installation of alternative water softener systems through partnerships with its wastewater treatment plants. The city could also explore partnerships with water service companies, in which new customers would receive a credit towards their new canister exchange account.

Action	Responsibility
A Provide information on energy-efficient water softener systems at the Building Division counter. Target local homebuilders with this information.	Building Division
B Partner with the local wastewater treatment plant to develop an incentive program to encourage customers to replace regenerating water softeners with exchange canister softeners or similar systems.	Building Division
C Contact local water service companies to explore the possibility for a new customer incentive program to further promote adoption of these technologies.	Building Division; Sustainability Coordinator

Measure E-4.4: Permanent Load Shift
 Supporting Measure – Not Quantified

Encourage participation in PG&E's Permanent Load Shift program to shift thermal cooling loads to off-peak and/or partial-peak hours.



Measure Background

PG&E’s Permanent Load Shift program, often referred to as “Shift & Save,” is to store thermal cooling capacity during off-peak hours and/or partial-peak hours in order to meet thermal cooling load in subsequent on-peak hours. The goal of this program is to shift 3.9 megawatts of load. The program's targeted customers are bundled service, commercial, industrial, agricultural, and large residential customers in PG&E's electric service territory. PG&E is working with Cypress Ltd. and Trane USA to implement this program.

The city will partner with PG&E to identify and provide outreach to local large-energy users that could financially benefit from participation in the program. The city will partner with the Solano Center for Business Innovation and the Solano Economic Development Corporation in its outreach activities to find regional efficiencies in program expansion and application in other Solano County cities. A statewide Permanent Load Shift technology incentive program is currently under development; the city should monitor its progress to identify opportunities for local application.

Action	Responsibility
A Work with PG&E to identify large-energy users that would benefit from peak-load shifting technologies and/or strategies. Targeted customers are bundled service, commercial, industrial, agricultural, and large residential customers.	Building Division; Sustainability Coordinator
B Monitor development of the statewide Permanent Load Shift program to identify opportunities for local application.	Building Division; Sustainability Coordinator

E-5: Building Cooling

Measure E-5.1: Building Shade Trees

2020 GHG Reduction Potential: **24 MT CO₂e/yr**

2035 GHG Reduction Potential: **49 MT CO₂e/yr**

Adopt a shade tree ordinance for new construction and develop a shade tree outreach campaign to encourage existing property owners to voluntarily plant shade trees.



Measure Background

Properly located trees can provide shading for residential and commercial buildings, and thereby reduce the need for air conditioning. The capacity of a tree to reduce GHG emissions is dependent on its age and species. As trees mature, their canopies increase in size and provide higher levels of shade and greater levels of building cooling in hot weather. Large, deciduous species are ideal for reducing building energy use as they provide shade in summer, but allow winter sunlight into buildings for passive solar gain in cooler weather. Additionally, trees gain carbon-capturing biomass in their trunks and roots as they absorb carbon from the air to grow.

The city will adopt a shade tree ordinance that requires new single-family residential units to plant two shade trees, and new multi-family residential buildings and new nonresidential buildings to plant one shade tree per 1,000 sq ft of air conditioned floor space. The ordinance will allow the installation of building-integrated vegetation in lieu of shade trees. The city will also work with local organizations to promote voluntary shade tree planting at existing buildings. To facilitate proper implementation of this measure, the city will develop a shade tree planting guide to instruct home builders, developers, landscapers, building managers, and property owners on proper shade tree selection and placement to maximize building cooling opportunities while preserving solar access on the roof. Planting guidance should describe the selection of climate-appropriate species and proper siting specifications (i.e., S, SW, or W side of buildings; no more than 20' from the building).

Action	Responsibility
A Amend the city's Development Standards per the new shade tree ordinance.	Planning Division
B Work with local environmental and conservation groups to advertise the various benefits of planting shade trees near existing buildings.	Building Division
C Develop a shade tree planting guide to facilitate proper tree selection and installation.	Building Division; Public Works

Progress Indicators	Year
1,300 new shade trees properly installed (does not include replacement trees for existing shade trees)	2020
2,600 new shade trees properly installed (does not include replacement trees for existing shade trees)	2035

E-6: Building Lighting

Measure E-6.1: Indoor Lighting Efficiency

2020 and 2035 GHG Reduction Potential: *See Statewide Reduction AB 1109*

Encourage voluntary adoption of efficient indoor and outdoor lighting technologies in residential and nonresidential buildings.



Measure Background

According to the 2009 California Residential Appliance Saturation Study, approximately 20% of residential electricity consumption is attributed to lighting^v. In nonresidential buildings, conventional commercial lighting, including T12 fluorescent bulbs and old exit sign lights, consume more energy than new T8 lights and light-emitting diode (LED) technologies. Lighting upgrades typically provide a short payback period for their investment, and are a good source of GHG emissions reductions.

The city will provide outreach and technical assistance to nonresidential property owners to encourage participation in PG&E's lighting upgrade program, which includes rebates for fixtures, lamps, accent/directional lighting, controls, and signage. The city will also provide outreach to multi-family property managers regarding lighting rebates through PG&E, including CFL replacement bulbs, activity sensors and timers, and replacing T-12 lamps with magnetic ballasts. Informational materials should demonstrate the simple-payback period associated with lighting improvements (typically 2-4 years). The city will also advertise PG&E's CFL rebate, or other lighting rebate programs, on the new sustainability website.

Action	Responsibility
A Develop lighting-efficiency informational materials that demonstrate the simple-payback period associated with lighting improvements and existing rebates. Post information on the Solano County Sustainability Webpage. Provided targeted outreach to large nonresidential building managers and multi-family property managers.	Building Division; Sustainability Coordinator
B Leverage existing energy-efficient lighting rebate programs offered through Energy Upgrade California, including fixture and lamp replacements/installation, accent and directional lighting, security lighting, lighting control systems, and PG&E's residential CFL rebate program.	Solano Center for Business Innovation; Sustainability Coordinator
C Encourage small businesses to participate in PG&E programs that provide technical assistance and access to incentives for energy efficiency upgrades (e.g., lighting).	Solano EDC

E-7: Renewable Energy

Measure E-7.1: Solar Photovoltaic Systems

2020 GHG Reduction Potential: **315 MT CO₂e/yr**
 2035 GHG Reduction Potential: **399 MT CO₂e/yr**

Facilitate the voluntary installation of solar PV systems on residential and nonresidential buildings.



Measure Background

Solar photovoltaic (PV) systems generate electrical power by converting solar radiation into direct current electricity using semiconductors. PV power generation employs solar panels composed of cells containing photovoltaic material. PV systems can be retrofitted into existing buildings, usually by mounting them on an existing roof structure or walls. Rio Vista’s solar potential is approximately 5.1 kWh/m²/yr, which is sufficient to support a solar PV installation that would cover a large percentage of an average home’s electricity demand.^{vi} In addition to residential rooftops, commercial and industrial rooftops tend to have large, flat roofs that are often well-suited for solar photovoltaic (PV). Parking lots also provide excellent opportunities for additional solar energy generation. According to PG&E data, Rio Vista contains nearly 70 residential solar PV systems installed since 2005, with a total capacity of approximately 200 kW.^{vii} However, numerous barriers may prevent widespread adoption of solar PV technology, including city regulations, up-front costs, misinformation or lack of information.

Financing is critical to the success of the solar PV program. Property owners will be able to finance their PV systems through various financing programs and rebates. As described in Measure E-3.2, the city will support the development of and participation in Solano County’s PACE program to further promote renewable energy systems for

residential and nonresidential buildings. Other financing models, such as power purchase agreements (PPAs), can be used to offset the initial capital cost of installing a solar PV system. Solar PV rebates are available through the California Solar Initiative and its related programs: New Solar Homes Partnerships, Multifamily Affordable Solar Housing Program, and Single-Family Affordable Solar Housing Program. Rebate amounts vary, and are typically based on the installed system size and expected performance. Some rebate programs have variable rebate steps, which decline as PV installed capacity increases.

The city will develop a comprehensive solar PV program that encourages homeowners to install PV systems through outreach advertising available rebate and incentive programs. Outreach efforts will aim to maximize community participation from homeowners, builders, and businesses by leveraging existing educational materials and links to technical assistance and rebates and financing programs. The city will encourage homeowners to request free solar PV audits provided by private solar financing and installation companies. The city will also offer priority permitting for new solar PV systems to further reduce implementation barriers. The city has already reviewed its zoning and building codes and other applicable ordinances to identify and remove regulatory barriers to solar installations (i.e., PV and solar hot water) on residential and nonresidential properties.

Action	Responsibility
A Provide priority permitting for building-scale renewable energy projects.	Building Division; Sustainability Coordinator
B Develop a comprehensive outreach campaign to increase voluntary participation in solar PV installation programs, including a directory of existing rebates/incentive programs, explanation of simple-payback calculations for solar PV systems, and technical assistance. Leverage existing solar PV informational materials from Energy Upgrade California, the California Solar Initiative, and PG&E.	Building Division; Sustainability Coordinator
C Develop informational materials about the benefits of PPAs offered through independent solar service providers. Post on the Solano County Sustainability Website, and make printed copies available at the Planning Department and Building Division counters.	Building Division; Sustainability Coordinator

Progress Indicators	Year
300 single-family units install 4.5kW PV system	2020
400 single-family units install 4.5kW PV system	2035

Measure E-7.2: Solar Water Heaters

2020 GHG Reduction Potential: **28 MT CO₂e/yr**

2035 GHG Reduction Potential: **163 MT CO₂e/yr**

Promote voluntary installation of solar water heaters in new construction and building retrofits through outreach campaign.



Measure Background

The effectiveness of a solar installation is described, in part, by its solar savings fraction (solar fraction). This measurement describes the percentage of a building's total energy demand that can be met through installation of a solar energy system. A 0% solar fraction indicates that no solar energy utilization is possible, while 100% would indicate full utilization of solar energy to meet building energy demand. Dixon has a 65% solar fraction for low-rise buildings (i.e., 1-2 stories) and a 44% solar fraction for multistory structures (i.e., 3 or more stories), indicating good potential for solar water heater applications.^{viii}

Solar water heating systems are a simple, reliable, and cost-effective method for harnessing the sun's energy to provide for hot water needs. Solar collectors, usually placed on the roof, absorb the sun's energy to heat water that is stored in a water tank. The State of California has recognized the value of solar hot water heaters. The California Solar Water Heating and Efficiency Act of 2007 (AB 1470), created a 10-year program aimed at installing solar water heaters in homes and businesses. AB 1470 was designed to lower the initial costs of purchasing a system, which averages around \$3,000-\$6,000.

Solar hot water systems can also be a cost-effective replacement for inefficient water heaters. According to the California Solar Initiative (CSI), solar hot water systems can lower energy bills by meeting 50 to 80 percent of hot water needs over a year. Though the high capital cost of solar water heater upgrades can pose a financial burden to homeowners, there are a range of financing and rebate options to offset these initial investment costs.

There are a number of financing options that may be used to reduce upfront costs, such as the PACE programs mentioned in Measure E-3.2, federal tax incentives through the Energy Policy Act of 2005, and financial incentives through the CSI-Thermal Program. Similar to the CSI solar rebate programs, the CSI-Thermal Program provides rebates for solar water heaters that decline in value as installation increases.

The Solar Water Heating Pilot Program, operated through San Diego Gas and Electric from 2007-2010, identified numerous barriers to the widespread adoption of solar water heating systems. In particular, participating contractors named permitting and inspection costs and delays as a primary obstacle to widespread adoption for single-family residential buildings because non-material costs represented approximately 65% of total system costs. That means, only 35% of total costs were related to the actual system price. To help address this problem, the city will consider reducing permitting

fees for solar hot water heater systems and will work to streamline the permitting process.

The city will also work with PG&E to create outreach opportunities that provide information about the financial benefits of solar hot water heaters, describe existing financing options and rebate programs, and explain the city’s efforts to encourage participation.

Action	Responsibility
A Collaborate with PG&E and the California Solar Initiative - Thermal Program to develop an outreach program to maximize installation of solar hot water systems and leverage existing funding opportunities.	Community Development; Sustainability Coordinator
B Streamline permitting process (e.g., building, electric, plumbing) for solar hot water system installation.	Building Division
C Provide priority permitting for building-scale renewable energy projects.	Building Division
D Reduce solar hot water heater permitting fees.	Building Division

Progress Indicators	Year
35 single-family residential units install solar hot water system; 5 multi-family units are served by solar hot water system	2020
180 single-family residential units install solar hot water system; 25 multi-family units are served by solar hot water system	2035

Measure E-7.3: District Energy Systems

Supporting Measure – Not Quantified

Encourage incorporation of district energy systems in new industrial growth areas that include on-site, or are located near, waste heat generation facilities.



Measure Background

District energy systems can provide a platform for utilizing waste heat and renewable energy sources and moving these resources around in a system to where and when they are most needed. Waste heat is generated through a variety of industrial processes, and can be captured and used as a heat source for buildings or to power other industrial processes.

District energy systems constructed to offset building heating loads require extensive infrastructure to capture heat from its waste source and deliver it to end users (e.g., residences, office buildings). In colder regions, the proportion of energy costs dedicated to space heating can be very high, which makes this type of system economically viable. Given the relatively low space heating demands in Rio Vista, an extensive district energy

system is not financially feasible. However, the city could identify its waste heat generators and attempt to attract compatible waste heat users that would benefit from the free use of process heat.

The city will work with the Solano Economic Development Corporation (EDC) to identify the thermal capacity of waste heat generators in Rio Vista, and identify the types of industries that could beneficially use that type of heat in their processes. Should district energy systems prove to be a viable tool for local economic development, the city will work to remove any regulatory barriers to system installation.

Action	Responsibility
A Inventory and assess existing sources of waste heat in the city.	Solano EDC; Sustainability Coordinator
B Remove regulatory barriers to the installation/evolution of district energy networks.	Public Works; Building Division
C Prepare educational and outreach materials with which to communicate Rio Vista’s district energy opportunities to potential developers or other stakeholders.	Community Development; Solano EDC
D Work with Solano EDC to attract waste heat users (e.g., agricultural drying facilities) that can be co-located near waste heat generators.	Community Development; Solano EDC

Measure E-7.4: Community Choice Aggregation

2035 GHG Reduction Potential: See *Progress towards 2035 Target* discussion at end of chapter

Support the County in its efforts to develop a community choice aggregation program to provide Solano County residents with a choice in their energy provider.



Measure Background

Solano County included a measure in its CAP to investigate the potential for a countywide community choice aggregation program (CCA). Assembly Bill 117, which was signed into law in 2002, enables California cities and counties, either individually or collectively, to supply electricity to customers within their borders through the establishment of a CCA. Unlike a municipal utility, a CCA does not own the transmission and delivery systems, but is responsible for providing electricity to its constituent residents and businesses. The CCA may own electric generating facilities, but more often, it purchases electricity from private electricity generators.

A key benefit of a CCA is that the participating jurisdictions can determine the amount of renewable energy contained within the generation portfolio. For example, a Solano County CCA could decide to provide 50% of its electricity from renewable sources, which would exceed State requirements directing California’s utilities to provide 33% of their electricity from renewable sources by 2020.

Developing a CCA will require a detailed analysis of energy demand, efficiency opportunities, and renewable generation opportunities in Solano County. Using existing models from other counties (e.g., Marin County) is likely to reduce the initial program design costs. The program would be most effective if the city partnered with other Solano County cities and the county government to jointly pursue a CCA program.

The city will work with the county and other interested participants in the preparation of feasibility studies, outreach campaigns, and other efforts to develop a countywide CCA.

Action	Responsibility
A Work with the county to prepare necessary study reports, informational materials, and any other supporting research and/or documents to help pursue a CCA program.	Sustainability Coordinator

E-8: Street and Area Lighting

Measure E-8.1: Street Light Upgrade

2020 GHG Reduction Potential: **21 MT CO₂e/yr**
 2035 GHG Reduction Potential: **21 MT CO₂e/yr**

Continue the city's street light upgrade program.



Measure Background

Streetlights account for approximately 9% of the city's municipal electricity use^{ix}. High-pressure sodium bulbs, commonly used in streetlights, require more energy and have a shorter lifespan than new induction and/or light-emitting diode (LED) lights. The short simple-payback period associated with lighting upgrades makes this an easy measure to implement.

The city has already started a program to upgrade its streetlights to LED technology, and will continue implementation of that program until all streetlights have been upgraded citywide.

Action	Responsibility
A Complete implementation of streetlight upgrade program.	Public Works

Progress Indicators	Year
100% of HPS bulbs are replaced with energy-efficient technology	2020 and 2035

E-9: Municipal Actions

Measure E-9.1: Municipal Renewable Energy Development

2020 GHG Reduction Potential: **34 MT CO₂e/yr**

2035 GHG Reduction Potential: **113 MT CO₂e/yr**

Explore opportunities for installation of renewable energy facilities at the city swimming pool, waste water treatment plant, and municipally-owned wells.



Measure Background

Transitioning to clean energy sources will allow Rio Vista to reduce communitywide emissions, and the installation of renewable energy systems on municipal buildings will show the city's leadership in the area of renewable energy generation.

The city will continue to pursue funding for municipal renewable energy projects that are already in the development pipeline. The city will work with other Solano County jurisdictions to identify best practices in selecting and financing municipal renewable energy systems. The city will also conduct a feasibility study to determine the potential costs and benefits of an inflow turbine energy system on municipally-owned wells, which could generate hydroelectric energy through existing pumping activities.

Action	Responsibility
A Continue to pursue funding for municipal renewable energy projects currently in the pipeline.	Public Works; Sustainability Coordinator;
B Collaborate with other Solano County jurisdictions to identify best practices and funding strategies.	Public Works; Sustainability Coordinator;
C Prepare a cost-benefit analysis of inflow turbine systems for municipally owned wells to generate hydroelectric energy. Research available funding sources to help defray implementation costs.	Public Works; Solano EDC; Sustainability Coordinator

Progress Indicators	Year
Develop 150 kW capacity of municipal renewable energy	2020
Develop 500 MW capacity of municipal renewable energy	2035

Measure E-9.2: Municipal Building Energy Efficiency

2020 GHG Reduction Potential: **41 MT CO₂e/yr**

2035 GHG Reduction Potential: **44 MT CO₂e/yr**

Establish a goal to reduce business-as-usual electricity use in municipal buildings by 15%.



Measure Background

Reducing municipal energy use will reduce communitywide GHG emissions, save taxpayer dollars, and set an example for the successful implementation of energy-saving technology.

To achieve 15% reductions in energy use the city will perform energy audits on select municipal buildings to identify future potential for energy efficiency improvements. As described throughout this chapter, numerous financing options and rebate programs are available to fund energy-efficiency improvements. The city could also explore energy saving performance contracts to finance improvements. Under this type of agreement, an Energy Services Company (ESCO) completes building energy audits to identify the most cost-effective retrofit options. The ESCO guarantees the amount of energy that will be saved under a defined retrofit package, and further guarantees that the value of energy savings would be sufficient to cover efficiency upgrade costs as long as the price of energy does not fall below a stipulated floor price. In most cases, the ESCO pays up-front costs associated with retrofit installation, further reducing financial risk to the city.

In addition to addressing building performance, the city could provide information and training to city employees on how to reduce energy consumption in the workplace. The city could conduct one campaign per year, ideally during National Energy Awareness Month in October, to educate employees about their energy consumption at work and ways to reduce consumption (e.g., turning off computers and monitors, turning off lights, using power strips). To incentivize participation, the city could consider advertising energy consumption trends during the campaign period and provide prizes for quantifiable reductions.

Action	Responsibility
A Perform energy audits on select city buildings to identify future potential for energy efficiency improvements.	Building Division; Public Works
B Consider using an energy performance contract to finance efficiency retrofits.	Public Works
C Conduct city employee energy use reduction campaign and incentivize participation.	Public Works; Sustainability Coordinator

Progress Indicators	Year
Municipal building energy use is reduced by 315,000 kWh/yr	2020
Municipal building energy use is reduced by 340,000 kWh/yr	2035

Measure E-9.3: Wastewater Treatment Plant Process Optimization

2020 GHG Reduction Potential: 171 MT CO₂e/yr

2035 GHG Reduction Potential: 171 MT CO₂e/yr

Continue to perform energy optimization audits at FSSD and implement audit results.



Measure Background

The city can improve the efficiency of wastewater pumping and treatment facilities by identifying and implementing energy-saving retrofits at the Beach and Northwest Wastewater Treatment Plants.

PG&E performs Integrated Energy Audits of wastewater treatment facilities to identify the most critical efficiency improvements and help sewer districts to select energy-saving projects and identify available financial incentives. PG&E helped the Fairfield Suisun Sewer District (FSSD) to save 1.3 million kWh/yr and install wind turbines with a 200 kW capacity. FSSD received \$350,000 in incentives from PG&E, contributing to a simple-payback of 2.7 years for its energy efficiency projects^x. FSSD now budgets for regular energy audits to ensure their facility is operating efficiently.

The city should work with PG&E and Veolia Water to complete energy audits of its wastewater treatment plants, and identify cost-saving energy efficiency upgrades and financial incentives. Upon successful completion of its first energy assessments, the city should budget for regular energy assessments to ensure the plants are operating efficiently.

Action	Responsibility
A Continue to budget for regular Integrated Energy Audits on Beach and Northwest Wastewater Treatment Plant operations.	Veolia Water
B Update the Wastewater Facilities Plans to include regular energy assessments and progress monitoring for implemented improvements.	Veolia Water

Progress Indicators	Year
Reduce energy use at Beach and Northwest Wastewater Treatment Plants by a combined 1.3 million kWh/yr	2020 and 2035

Transportation + Land Use Strategy

Transportation-related emissions make up approximately 41% of the communitywide 2005 emissions inventory. Vehicle fuel efficiency, fuel carbon content, and vehicle operations, all influence the amount of transportation emissions generated in a community. However, these emissions are largely generated by the number of vehicle miles traveled (VMT) by residents and employees. Long vehicle trips and high numbers of trips create higher emissions.

While state-mandated technological changes in fuel efficiency and reductions in fuel carbon content will help reduce transportation emissions, significant reductions will require local action. Eliminating or shortening vehicle trips is made possible through increasing alternative transportation options, such as transit, bicycling, or walking, and through the distribution of diverse land uses relative to transportation options.

The transportation and land use strategy includes efforts to improve pedestrian mobility to encourage walking between nearby destinations and accommodate non-automotive circulation. Enhancing the bicycling network and improving access to transit stops also support alternative transportation options.

Where people live, work, shop, and play also determines how far they have to travel daily, and whether they choose to walk, bike, use public transit, or drive. Measures that support mixed land uses and opportunities for higher-density development along existing transit routes are essential to supporting alternative transportation options.

Facilitating a transition to alternative fueled vehicles and managing daily traffic demand can also reduce emissions. This includes incorporating alternative fueled vehicles in the municipal fleet, providing charging and refueling stations for alternative fueled vehicles communitywide, and assisting local businesses with automobile travel reduction efforts.

Emissions reductions from the transportation and land use strategy total 288 MT CO₂e/yr in 2020. This represents approximately 3% of total CAP measure reductions. While local transportation reduction estimates may appear low as compared to the proportion of transportation emissions in the city's baseline inventory, it should be noted that statewide actions addressing transportation emissions account for nearly 46% of total emissions estimated in this CAP. Many of the transportation measures included here support higher quality-of-life indicators, such as walkable communities, improved local air quality, and reduced traffic congestion.

T-1: Pedestrians + Bicycles

Measure T-1.1: Pedestrian Environment Enhancements

Supporting Measure – Not Quantified

Continue to plan for safe, attractive pedestrian environments that encourage walking between nearby destinations.



Measure Background

Pedestrian enhancements encourage walking, potentially increasing foot traffic to local retail establishments and businesses, while decreasing automobile trips and emissions. Pedestrian enhancements include the provision of seating, shading, way-finding signs, safe crosswalks, and traffic calming measures. Providing connectivity and convenient, enjoyable pedestrian areas also improves residents' quality of life.

Recent pedestrian safety improvements in Rio Vista include the installation of a lighted crosswalk at the intersection of SR 12 and Gardiner Way and the addition of bulb-outs at several intersections. Bulb-outs extend the sidewalk into the on-street parking lane to narrow the crossing width of a roadway for pedestrians. Policies, programs, and design criteria that contribute to walkability and pedestrian connectivity are incorporated into the city's General Plan. Additionally, the City Council adopted a complete streets policy in 2012 to support a diversity of transportation users on city streets, including automobiles, bicycles, and pedestrians.

The city will continue to work with STA on updates to the Countywide Pedestrian Master Plan, including the prioritization of projects to be implemented within Rio Vista. The Countywide Plan provides a framework for local governments to identify important improvements that would increase pedestrian safety in their cities and throughout Solano County. The Countywide Plan was developed so that it could be adopted by individual cities to serve as their local Pedestrian Master Plan, thereby fulfilling a common criterion of pedestrian-improvement grant funding programs. Rio Vista will either adopt the Countywide Plan or develop its own Pedestrian Master Plan. The city should also identify funding sources to help install priority projects, particularly for instances when a local match is required to qualify for grant funds.

Action	Responsibility
A Develop Pedestrian Master Plan or adopt Solano Countywide Pedestrian Plan to serve as guidance for pedestrian improvements; update plan every 3-5 years	Public Works
B Prioritize implementation of pedestrian enhancements as identified in Pedestrian Master Plan	Public Works
C Identify funding sources to provide city's match for project planning, design, and construction	Public Works

D	Implement city's complete streets policy requiring accommodations for non-automotive circulation on newly constructed roads and during major roadway improvement projects	Public Works
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Measure T-1.2: Bicycle Infrastructure

Supporting Measure – Not Quantified

Continue to install bicycle paths and lanes within the community to increase bicycle ridership and safety.



Measure Background

According to the city’s General Plan, bicycle infrastructure is currently extremely limited within Rio Vista, with bicycle paths limited to a single bicycle lane on Poppy House Road and along SR 12. The lack of designated infrastructure contributes to a perceived sense of danger for cyclists who are forced to share the road with drivers. As development increases in the city, there may be additional demand for Class I and II bicycle facilities.

Most transportation grant-funding agencies that provide resources for bicycle infrastructure expansion require applicants to have an adopted Bicycle Master Plan to demonstrate that opportunities and constraints related to community cycling have been identified and analyzed. Similar to the Countywide Pedestrian Master Plan described in Measure T-1.1, STA also worked with Solano County jurisdictions to prepare a Countywide Bicycle Plan, which the individual cities can adopt as their own local plan.

The city should adopt the Countywide Plan as a first step, and then work to prioritize local bicycle projects that would help to define a backbone system. As new development occurs in Rio Vista, particularly master planned communities, the city should implement its complete streets policy to provide new bicycle accommodations in the city’s growth areas. The city should also continue to partner with STA on implementation of the regional bicycle network.

Action	Responsibility
A Develop a Bicycle Master Plan or adopt the Solano Countywide Bicycle Plan to serve as guidance for bicycle network improvements; update plan every 3-5 years	Public Works; Community Development;
B Prioritize implementation of bicycle network enhancements as identified in Bicycle Master Plan	Public Works
C Identify funding sources to provide city's match for project planning, design, and construction	Public Works
D Identify and work to remove barriers that could inhibit cyclists from accessing various transit stations / stops	Public Works ; Community Development

Measure T-1.3: Bicycle Outreach Program

Supporting Measure – Not Quantified

Develop a bicycle outreach program to promote communitywide "bikeability" through safety programs, bicycle tune-up clinics/training, and partnerships with bicycle advocacy groups and cycling clubs.



Measure Background

Bicycle education and outreach are important to increasing bicycle safety and ridership within the community. These programs can increase community members' comfort with cycling for exercise or running daily errands, with instruction on proper bicycle maintenance, safe cycling techniques, and an introduction to local cycling groups. STA currently provides a successful countywide Safe Routes to School program, which includes bicycle rodeos for elementary school students and a Walk N' Roll week to teach safety in walking and cycling.

The city will continue to partner with STA on implementation of the Safe Routes to School program, including efforts to evaluate efficacy of the program to determine if modifications should be made in the future. The city will also support STA in implementation of the Countywide Wayfinding Signage Program Phase II. Regional bicycle trail directional signs were installed in Phase I of this regional program. Phase II will include installation of local wayfinding signs to help riders find points of interest, such as Downtown Rio Vista and city parks. The city can also work with local cycling clubs or advocacy groups to identify dangerous conditions that should be addressed in future updates of the Bikeways Plan.

Action	Responsibility
A Work with STA to continue its bicycle safety education activities, including bicycle rodeos and Walk-and-Roll programs at local schools	STA; Public Works;
B Solicit comments from local cycling clubs/advocacy groups to identify dangerous cycling conditions within city; address problem areas through Safe Routes to School (SRTS) Program	Public Works
C Support STA in effort to evaluate efficacy of existing SRTS program to identify changes in pedestrian or bicycle accidents and modify future program as necessary	STA; Public Works
D Support STA in adoption and implementation of Countywide Wayfinding Signage Program Phase II	STA; Public Works

T-2: Public Transit

Measure T-2.1: Transit Route Stabilization

Supporting Measure – Not Quantified

Ensure maintenance of existing transit service programs before attempting to expand services.



Measure Background

Successful public transit systems shift commute trips from personal automobiles to buses, shuttles, trains, and other options. Well-designed public transit systems serve a community’s major residential, employment, and cultural centers at service intervals that allow riders to easily and predictably plan trips. Viable transit systems are dependent upon a sufficient ridership base, which often requires an average minimum population or employment density around transit stops.

The Rio Vista Delta Breeze transit system provides a fixed route bus service with routes within the city, between neighboring cities and the Pittsburg/Bay Point BART Station, and with connections to Lodi. The Delta Breeze provides a necessary transportation option for underserved populations in the city, including seniors and residents without access to a vehicle. For example, a Ride-with-Pride Program provides transportation to medical appointments and social service programs for seniors who no longer drive. Additionally, STA provides a countywide ambassador program that offers assistance to riders in using the transit system (e.g. help with buying tickets/passes).

The diffuse, lower-density nature of Rio Vista’s development makes the creation of a robust public transit system difficult. Rather than attempt to expand the geographic extent of the current transit system, the city will first work with STA to ensure existing levels of service continue into the future. The city will work with STA to implement its Short-Range Transit Plan, which includes near-term strategies to stabilize the existing transit system. The city will also continue to explore opportunities through the public planning process to increase densities and intensities within certain areas of the city. Measure T-3.1 and T-3.2 address land use strategies that could help to strengthen the existing transit system, and in the long-term, provide a sufficient ridership base to allow for system expansion.

Action	Responsibility
A Work with STA to implement findings of Short-Range Transit Plan to keep current transit systems viable	STA; Public Works
B Facilitate higher density development within designated Priority Development Areas to increase potential ridership of residents and employees along existing transit routes	Community Development
C Enhance local transit service next to high density, mixed-use development areas to take advantage of proximity to new potential transit riders	STA; Public Works; Community Development

T-3: Land Use

Measure T-3.1: Transit-Oriented Development

Supporting Measure – Not Quantified

Create opportunities for new high-density, mixed-use development adjacent to transit centers.



Measure Background

Transit-oriented development (TOD) places higher density and intensity development within walking distance of primary transit stops. This strategy brings residents and jobs closer to transit opportunities, providing additional ridership for the public transit system. Successful TOD can take various shapes, depending on the character of the community. TOD can focus on increasing employment near transit stops, typically within a ½-mile radius, provided adequate pedestrian connectivity is available for riders to then reach their jobs. It can also focus on increasing residential densities near transit stops, usually within a ¼-mile radius. TOD can also include a mix of uses (e.g., residential, office, retail) when the goal is to develop a more complete neighborhood center.

Community opposition to increased densities or intensities may hinder local efforts to encourage TOD. Local land use and development policies may also pose a barrier. Parking standards that ignore the potential for reduced automobile trips in TOD may inhibit development due to the high cost of providing parking.

The city will conduct a study of parking availability in Downtown Rio Vista as well as the potential future parking demand based on existing land use designations. This study will help to determine if future TOD projects could be allowed parking reductions or exemptions without negatively affecting the neighborhood. Additionally, the city will consider opportunities for shared parking in new growth areas for developments that include a mix of land uses and are near existing or planned transit options. The city will also identify potential areas for increased development density and/or intensity, and verify that adequate infrastructure exists to support that level of development.

Action	Responsibility
A Reduce off-street parking requirements for transit-oriented and mixed-use developments, for developments providing shared parking, and for developments that incorporate travel demand management measures	Community Development
B Facilitate projects that result in net increase in population or employment through land use designations within 1/4 mile walking distance of future planned or proposed transit stops	Community Development
C Work with Public Works Department to evaluate capacity for higher-density/intensity development in future transit areas, and develop prioritization and funding strategies to complete necessary improvements	Community Development

Measure T-3.2: Mixed-Use Development

Supporting Measure – Not Quantified

Encourage mixed-use development through land use and zoning designations to support alternative transportation options for certain daily activities.



Measure Background

The distribution of land uses and the degree of street connectivity within a city influences how people travel. Land use strategies that place daily needs near each other and near residential neighborhoods allows some trips to be made without a car. Development patterns that provide convenient pedestrian connectivity to parks, schools, retail, and jobs also supports non-automotive transportation options. Mixed-use development often creates these pedestrian-friendly environments with a variety of uses nearby that allow people to address some or all of their daily live, work, play and shop needs in one place.

Single use zoning, as the name implies, only allows one type of land use within an area, which can result in large areas dominated by a single development type, such as single-family houses or shopping. This type of development makes use of alternative transportation options difficult because densities are often too low to support public transit and the distances between different land uses are too great to encourage walking or cycling. The city plans to update its General Plan to include new policies that promote mixed-use development, particularly within the city’s designated Priority Development Area.

In conjunction with the transit-oriented development measure described above, the city will work with residents to identify opportunities for future mixed-use development through land use and zoning changes. The same parking analysis described in Measure T-3.1 can be used to determine if parking requirements for mixed-use development can be reduced based on shared parking opportunities that result from mixing land uses.

Action	Responsibility
A Facilitate opportunities to increase future mixed-use development projects, particularly those near future transit centers, primary transit stops, and/or within designated Priority Development Areas	Community Development
B Reduce off-street parking requirements for transit-oriented and mixed-use developments, for developments providing shared parking, and for developments that incorporate travel demand management measures [Same as T-3.1 Action A]	Community Development

T-4: Alternative Fuels

Measure T-4.1: Alternative Fuel Vehicles

2020 GHG Reduction Potential: **230 MT CO₂e/yr**

2035 GHG Reduction Potential: See *Progress towards 2035*

Target discussion at end of chapter

Encourage communitywide use of alternative fuel vehicles through expansion of alternative vehicle refueling infrastructure.



Measure Background

Alternative-fueled vehicles use electricity, compressed natural gas (CNG), liquefied petroleum gas (LPG), hydrogen fuel cells, or other fuel types that have lower carbon content than traditional gasoline and diesel fuel. As engine technologies continue to advance, alternative-fueled vehicles have become increasingly popular to reduce fuel costs and emissions.

One of the primary challenges to increased adoption of alternative-fueled vehicles has been limited refueling infrastructure available to support the various vehicle types. Often referred to as “range anxiety”, an incomplete network of refueling infrastructure limits broad adoption of these vehicles as drivers feel confined to the limits of their known refueling locations. Local governments can play a role in combatting range anxiety by exploring cost-effective opportunities to install recharging infrastructure for electric vehicles, requiring pre-wiring for electric charging stations in new developments and parking lots, and working regionally to construct expensive infrastructure, such as CNG and LPG refueling stations. The city has taken early action to this end by installing two Global Electric Motorcar (GEM) charging stations in the community.

The city will look for cost-effective opportunities to install additional electric vehicle charging stations in publicly accessible areas of the community, through grant funded opportunities or donations from technology providers. The city will also require pre-wiring for at-home electric vehicle charging stations in new development (that is not already permitted with an existing Development Agreement), and will work with STA to develop requirements for the installation of EV charging units in new parking lots. The city will continue to support STA’s efforts to develop a regional CNG refueling station that could be used to refuel municipal fleet vehicles, and support efforts to make this charging station available for public use, if possible.

Action	Responsibility
A Continue to explore cost-effective ways to increase alternative vehicle charging / refueling infrastructure within the city	Public Works; Community Development; Sustainability Coordinator
B Require pre-wiring for at-home electric vehicle charging ports in future new single family and multi-family construction (i.e., those not currently permitted); update city's building code to reflect these changes	Building Division
C Work with STA to develop informational brochures and technical support for developers / contractors interested in providing electric vehicle charging ports in new projects	STA; Building Division; Community Development;

Progress Indicators	Year
5% of gasoline passenger cars switch to plug-in hybrid electric (PHEV);	2020
5% of gasoline light-duty trucks switch to PHEV;	
5% of diesel passenger cars switch to PHEV;	
5% of diesel light-duty trucks switch to PHEV	

Measure T-4.2: Municipal Alternative Fuel Vehicles

Supporting Measure – Not Quantified

Shift municipal vehicle fleet from gasoline- and diesel-powered vehicles to alternative fueled vehicles, to the extent possible.



Measure Background

Compressed natural gas (CNG), hybrid vehicles, and plug-in electric vehicles are increasingly being incorporated into municipal fleets nationwide to help reduce vehicle-related emissions, lower operating costs, and show sustainability leadership at the local government level.

Many municipal fleet vehicles could be replaced with cleaner versions capable of performing the same tasks upon regular vehicle replacement. Passenger vehicles and light-duty trucks can often be replaced with battery electric vehicles or plug-in hybrid electrics. Some diesel-powered heavy-duty vehicles and equipment can be replaced with CNG or LPG vehicles, if refueling infrastructure is available. Recent diesel and natural gas prices have made this type of replacement feasible from an economic standpoint as well.

In an effort to modernize the city's municipal fleet, the city will support efforts to develop a regional alternative fuel vehicle procurement program to leverage economic benefits of bulk purchases. The city will also partner with STA in its efforts to develop a regional CNG refueling station for use by municipal fleets. Development of this facility could support future conversion of the Rio Vista Delta Breeze fleet to CNG vehicles.

Action	Responsibility
A Consider purchasing alternative fueled vehicles and/or more fuel-efficient vehicles during routine vehicle replacement	Public Works; Building Division
B Support STA in its efforts to develop a CNG refueling station for public and private use within Solano County	STA; Public Works
C Pursue grant funding or vendor's promotional offers to install EV charging stations at city facilities for use by municipal vehicles	Public Works; Sustainability Coordinator
D Consider partnering with other Solano County governments in regional alternative fueled vehicle procurement program to achieve lower vehicle costs through bulk procurement	Public Works; Sustainability Coordinator

T-5: Transportation Demand Management

Measure T-5.1: Demand Management Program

2020 GHG Reduction Potential: **58 MT CO₂e/yr**
 2035 GHG Reduction Potential: **105 MT CO₂e/yr**

Provide informational resources to local businesses subject to SB 1339 transportation demand management program requirements and encourage voluntary participation in the program.



Measure Background

Transportation demand management (TDM) programs are a collection of policies and incentives that reduce travel congestion at peak commute hours. Common TDM practices include subsidized or pre-tax transit passes, flexible work hours, emergency rides home, vanpool or carpool incentives, and parking cash-out programs that pay employees who agree to give up their guaranteed parking spaces.

SB 1339 authorizes the Bay Area Air Quality Management District (BAAQMD) and Metropolitan Transportation Commission (MTC) to adopt and implement a regional ordinance known as the Bay Area Commuter Benefits Program. The program requires employers with 50 or more employees within MTC's jurisdiction to select one of four commuter benefit options (e.g. transit or vanpool subsidy). Although the City of Rio Vista is not within the BAAQMD boundaries, the city is within MTC's boundaries and therefore, subject to the requirements of SB 1339.

Some local businesses already have employee carpooling programs in place, including California Vegetable Specialties and the Dutra Group. Additionally, the city has 12

vehicle parking spaces and bike parking at its Downtown Park-and-Ride facility, which can be used to help facilitate additional carpooling programs.

The city will support STA, which is largely responsible for implementation of the TDM program, in its efforts to comply with program requirements. STA already has a well-established rideshare network and incentivizes the creation of new vanpools, which are seen as the likeliest path towards compliance for Solano County jurisdictions.

BAAQMD has made funding available to help its members comply with the legislation. However, Rio Vista is within the Yolo Solano Air Quality Management District (YSAQMD), which has not yet provided funding to its members to help with compliance. Rio Vista will work with STA and YSAQMD to identify potential funding opportunities that will achieve the goals of SB 1339. The city will also work with STA on an outreach campaign directed at local businesses of fewer than 50 employees, to attract voluntary participation in the TDM program.

Action		Responsibility
A	Support STA's efforts to implement SB 1339 TDM program requirements	STA; Sustainability Coordinator
B	Work with STA on outreach campaign targeting employers with 50 or fewer employees to encourage voluntary participation in TDM program activities, including pre-tax deductions for transit expenses, new vanpool creation, and Solano Commute Challenge	STA; Sustainability Coordinator
C	Work with other Solano County cities within YSAQMD to identify funding source to help implement TDM program	STA; YSAQMD

Progress Indicators	Year
430 employees voluntarily participate in rideshare program or telecommuting/alternative work schedule	2020
780 employees voluntarily participate in rideshare program or telecommuting/alternative work schedule	2035

Measure T-5.2: Intelligent Transportation

Supporting Measure – Not Quantified

Improve traffic signal coordination on major local roadways to reduce congestion during peak travel times.



Measure Background

Building an efficient transportation system can improve traffic flow and reduce congestion-related transportation emissions. Intelligent transportation systems (ITS) incorporate traffic signal synchronization on major roadways to reduce instances of “stop-and-go” traffic and vehicle idling.

The city currently has only two traffic signal lights, both of which are owned and maintained by CalTrans. As future growth areas within the city are developed and traffic levels increase, the city will consider opportunities to pursue ITS on local roadways or SR-12 in coordination with CalTrans.

Action

Responsibility

A	Continue to partner with CalTrans on ITS signal light coordination program along SR-12	Public Works
B	Explore opportunities for additional ITS projects as city's new growth areas develop	Public Works

Water Strategy

Water-related GHG emissions primarily come from the energy used to pump, transport, and treat potable water and wastewater. Water-related emissions accounted for approximately 3% of the communitywide GHG inventory.

With water supplies expected to continue declining into the future, water conservation strategies have the added benefits of aligning demand with future water availability, improving public health, and saving ratepayers money.

Senate Bill (SB) X7-7 (2009) requires the state to achieve a 20% reduction in urban per capita water use by December 31, 2020. The state is required to make incremental progress toward this goal by reducing per capita water use by at least 10% on or before December 31, 2015. SB X7-7 requires each urban retail water supplier to develop both long-term urban water use targets and an interim urban water use target. This law also creates a framework for future planning and actions for urban and agricultural users to reduce per capita water consumption 20% by 2020.

The GHG emissions reduction potential from implementing SB X7-7 locally is 138 MT CO₂e/yr in 2020, which represents 1.3% of total emissions. While the level of emissions reductions attributed to this measure is relatively small, the long-term water conservation benefits it provides are highly valuable to an agricultural community such as Solano County.

W-1: Urban Water Management Plan

Measure W-1.1: SB-X7-7

2020 GHG Reduction Potential: **138 MT CO₂e/yr**

2035 GHG Reduction Potential: **170 MT CO₂e/yr**

Implement the water conservation policies contained within the city's Urban Water Management Plan.



Measure Background

The City of Rio Vista is the urban water service provider to residents and businesses within the city limits. In accordance with state law, the city adopted its most recent Urban Water Management Plan (UWMP) in 2010.

As part of its UWMP, the city demonstrates its current and future abilities to provide water within its service boundaries. Additionally, SB X7-7 requires that urban water providers adopt conservation targets and implementation plans that will achieve a 20% per capita water use reduction by 2020. The city incorporated its water conservation targets and plan into its current 2010 UWMP. In general, the plan identifies best management practices (BMPs) in water conservation that are promoted by the

California Urban Water Conservation Council, and describes which are currently employed in Rio Vista. The city is presently implementing the following BMPs to conserve water and achieve long-term water targets:

- + residential plumbing retrofits;
- + system water audits;
- + large landscape conservation;
- + metering;
- + conservation programs for commercial, industrial, and institutional accounts;
- + public information; and
- + water conservation coordinator.

This CAP assumes that the city will implement the BMPs identified within its UWMP, and will achieve its 2020 water conservation targets.

Action	Responsibility
A SB-7X-7: Support water districts' in their implementation of water conservation policies contained within Urban Water Management Plans.	City of Rio Vista; Sustainability Coordinator

Progress Indicators	Year
20% reduction in per capita water use by 2020 over baseline established in UWMPs	2020 and 2035

Solid Waste Strategy

Waste disposal creates emissions when organic waste (e.g., food scraps, yard clippings, paper and wood products) is buried in landfills and anaerobic digestion takes place, emitting methane. Additionally, the extraction and processing of raw materials for consumer products, distribution to consumers, and eventual disposal of the products, creates emissions as well. In Rio Vista, about 2% of GHG emissions are associated with solid waste generation and disposal in landfills.

The zero-waste concept in waste management is a high-level goal to increase communitywide solid waste diversion efforts above the 90% range. Implementation of the county's Integrated Waste Management Plan can help to shift waste generation patterns over time. Other opportunities to reduce waste and related emissions include programs to divert waste away from landfills, increase recycling rates, reuse waste byproducts (e.g. construction materials), and expand organic waste collection.

Recycling helps to remove organic materials, like recyclable paper and cardboard, from the waste stream where it would ultimately contribute to landfill methane emissions. One option to increase recycling is through the enhancement and promotion of commercial paper recycling campaigns, in an effort to divert a broader range of recyclable paper away from landfills. Additionally, measures can encourage coordination between local businesses, waste haulers, and the County Department of Resource Management to increase commercial waste diversion and identify reusable waste byproducts. Construction and demolition waste can also be diverted, in increasingly higher proportions, through recycling or material reuse.

Although a number of the solid waste measures presented below cannot be quantified at this time, the results of their implementation will still make meaningful contributions to statewide emissions reduction efforts. Their inclusion within this CAP also provides future opportunities for regional implementation efforts, should other local governments seek collaboration on any of these measures.

The total GHG emission reduction potential of the waste strategy is 34 MT CO₂e/yr in 2020. Solid waste reductions represent approximately 0.3% of total reductions in 2020.

SW-1: Waste Reduction

Measure SW-1.1: Landfill Diversion

Supporting Measure – Not Quantified

Maximize waste diversion communitywide through preparation of a solid waste strategic plan.



Measure Background

The purpose of a solid waste strategic plan is to establish a framework that allows a community to achieve long-term waste reduction goals. Implementation of such a plan would be a comprehensive effort including expanded recycling programs, green waste and organics collection, source reduction, and byproduct re-use from area industries. Assembly Bill 939 requires local jurisdictions to meet numerical diversion goals. Although landfill capacity is no longer considered the statewide crisis it once was, solid waste diversion programs protect public health and safety and extend the operable life of the area’s landfills.

The Solano County Department of Resource Management works with local jurisdictions to prepare the *Countywide Integrated Waste Management Plan (CIWMP)* and its periodic updates. Rio Vista will continue to work with the county on implementation of the CIWMP, and will establish a non-binding goal to exceed the 50% communitywide solid waste diversion requirements in AB 939. Longer-term strategies like this, while not intended to be implemented immediately, will help the city to make progress on its future emissions reduction goals. The city can also leverage its existing relationship with Rio Vista Sanitation Service to identify local opportunities for additional waste reductions.

Action	Responsibility
A Continue to work with the County Department of Resource Management to update and implement the Countywide Integrated Waste Management Plan (CIWMP)	Public Works; Sustainability Coordinator
B Establish non-binding goal and implementing strategy to exceed 50% communitywide solid waste diversion requirements established by AB 939, either through updates to CIWMP elements or through preparation of standalone strategic plan	Public Works; Sustainability Coordinator
C Work with franchise waste haulers to identify additional opportunities for solid waste diversion	Public Works

Measure SW-1.2: Commercial Recycling Program

Supporting Measure – Not Quantified

Increase commercial paper recycling rates through implementation of AB 341 and targeted outreach campaigns.



Measure Background

Commercial establishments typically generate white paper, mixed office paper, newspaper, and corrugated cardboard. Approximately 90% of all office waste is paper. According to the US EPA, commercial establishments also generate a large portion of the estimated 24.1 million tons of corrugated cardboard discarded each year. Enhanced

office paper recycling will help reduce emissions associated with organic landfill waste, and help to conserve raw materials.

Assembly Bill 341 (2011) requires development of commercial and multi-family residential recycling programs statewide. AB 341 also sets a 75% statewide recycling goal for 2020 (as compared to the 50% solid waste diversion requirements embodied in AB 939). As the city’s contract waste hauler, Rio Vista Sanitation Service is helping commercial customers begin new recycling programs or improve existing ones through no-cost site visits to help businesses choose the correct level of service that fits their needs.

The regional sustainability coordinator will work with area franchise waste haulers to develop informational materials to help increase office paper recycling. These materials should highlight the broad range of office paper products that can be recycled.

Action	Responsibility
A Support franchise haulers, as necessary, in their outreach efforts to increase recycling rates among commercial and multi-family residential customers, as specified in AB 341	Public Works; Sustainability Coordinator
B Work with County Department of Resource Management and franchise waste haulers to develop enhanced paper recycling outreach campaign directed at office managers that explains full range of recyclable paper products that can be diverted from solid waste stream	Public Works; Sustainability Coordinator

Measure SW-1.3: Source Reduction Program

Supporting Measure – Not Quantified

Identify opportunities for creative reuse of industrial waste material.



Measure Background

Source reduction programs are strategies to reduce the volume of waste generated by certain activities or processes, and are designed to eliminate waste before it is created. These programs typically influence the design, manufacturing, and packaging of goods and materials to decrease both resource inputs and waste outputs. These programs can also be applied at the broader community level to address certain waste-generating activities. The promotion of reusable shopping bags is a common source reduction program intended to minimize solid waste disposal and pollution associated with plastic bag use.

At the individual business scale, source reduction programs can result in operational costs savings related to solid waste disposal or even become a revenue generator. For example, the Campbell Soup Company (with local operations in Dixon) has waste recycling programs that focus on recycling food waste, corrugated paper, steel drums, office paper, plastic, fluorescent tubes, batteries, wood pallets and scrap metal. In addition, Campbell's Asset Recovery program recycled or reused almost 1.2 million pounds of used equipment in 2012, generating nearly \$700,000 in sales revenue.^{xi}

Certain businesses may also find that the waste materials produced from their operations can be used as the input material for another business. For example, Rio Vista’s California Vegetable Specialties has working relationships with area farms that receive its endive waste products for use as animal feed. This type of symbiotic relationship can result in operating costs savings for both businesses, if these industry connections can be identified. Solano County’s agricultural sector could be an excellent candidate if beneficial reuse opportunities can be found for its organic waste stream. The Solano Center for Business Innovation has organized round table discussions with Allied Waste, one of the franchise waste haulers operating within the county, to identify opportunities for waste reuse at a local industrial park. This type of discussion could be expanded to include other waste haulers, large waste generators, and business leaders to identify interconnection among the county’s industries and businesses. Results from these discussions could help inform a targeted economic development campaign. If a beneficial waste product is found to be in abundance, businesses that use such a product as an input material could be enticed to co-locate closer to the resource. The city will partner with the Solano Center for Business Innovation, franchise waste haulers, and local industries to identify potential byproduct reuse.

Action	Responsibility
A Work with Solano Center for Business Innovation, region’s franchise waste haulers, and local industries to identify opportunities to reuse waste byproducts from one manufacturing process as input materials for another	Sustainability Coordinator; Solano Center for Business Innovation

SW-2: Organic Waste

Measure SW-2.1: Food Scrap and Compostable Paper Diversion

2020 GHG Reduction Potential: **3 MT CO₂e/yr**

2035 GHG Reduction Potential: **76 MT CO₂e/yr**

Provide infrastructure for collection of food scraps and compostable paper in green waste bins.



Measure Background

According to CalRecycle, food scraps account for nearly 16% of the state’s total waste stream, including more than 25% of the residential waste stream and 15% of the commercial waste stream.^{xii} Food scraps are unwanted cooking preparation and table scraps, such as banana peels, apple cores, vegetable trimmings, bones, egg shells, meat, and pizza crusts. Compostable paper, sometimes called food-soiled paper, usually comes from the kitchen and is not appropriate for paper recycling due to contamination. Materials such as stained pizza boxes, uncoated paper cups and plates,

used coffee filters, paper food cartons, napkins, and paper towels are all compostable. Diverting these organic items from the landfill helps to reduce methane gas generation from anaerobic decomposition, and helps to extend the operable life of a landfill.

Rio Vista’s current waste hauling contract with Rio Vista Sanitation Service allows for regular collection of solid waste and recycling, and additionally collects yard waste twice annually. Communities that provide regular yard waste collection through green bins also typically allow for collection of some residential food scraps along with yard waste in the bins. While there is limited participation data available to determine what percentage of household food waste is successfully diverted in most communities, without collection methods in place it is likely that the majority of compostable waste ends up in landfills.

Additionally, some communities have implemented commercial food scrap collection pilot programs to help divert additional organic materials from the solid waste stream. These programs typically work to remove logistical barriers associated with food scrap collection, including space limitations for additional collection bins, odor and pest control related to collection frequency, and employee training and/or customer education on how the programs work. Commercial food scrap generators include facilities with industrial kitchens, such as hotels, restaurants, schools and universities, and conference centers, as well as food distributors, such as grocery stores. Other commercial land uses, like offices and retailers, typically generate much lower volumes of food scraps than these other uses.

To enable local collection of food scraps and compostable paper, the city will first include regular green bin collection service in its franchise waste hauling contract, as described below in Measure SW-2.2. Following implementation of this service, the city will partner with the Solano County Resource Management Department and its franchise waste hauler on public outreach campaigns, including local elementary school programs, to explain what foods can be composted and why it is important. The city will also discuss opportunities with their franchise waste hauler to include compostable paper collection in the green waste bins for enhanced waste diversion. The city will also research commercial food scrap collection best practices from similarly sized communities, and work with local business organizations and franchise waste haulers on development of a voluntary food scrap collection program for the city.

Action	Responsibility
A Include yard waste, food scrap, and compostable paper collection services through provision of green waste bins as part of next franchise hauler contract	City Manager; Public Works
B Partner with Solano County Resource Management Department and franchise waste haulers on public outreach campaign promoting food scrap collection in green waste bins	Community Development; Sustainability Coordinator
C Provide information to local elementary schools on existing food scrap diversion program for incorporation into on-going recycling curriculum	Building Division; Sustainability Coordinator
D Work with franchise waste haulers, Rio Vista Chamber of Commerce, and other local business organizations to encourage participation in voluntary commercial food scrap collection program	Public Works; Sustainability Coordinator
E Identify opportunities to share best-practices and lessons learned with other cities in Solano County that have implemented similar programs	Sustainability Coordinator

Progress Indicators	Year
10% of households divert 20% of their food scraps through green waste bins or on-site composting	2020
10% of commercial businesses divert 25% of their food scraps from solid waste stream	
40% of households divert 50% of their food scraps and compostable paper through green waste bins or on-site composting	2035
30% of commercial businesses divert 50% of their food scraps and compostable paper from solid waste stream	

Measure SW-2.2: Yard Waste Diversion

2020 GHG Reduction Potential: **6 MT CO₂e/yr**

2035 GHG Reduction Potential: **53 MT CO₂e/yr**

Contract with a waste hauler to provide yard waste and food scrap collection services.



Measure Background

Yard waste includes leaves, grass clippings, and downed branches, and can easily be composted through either backyard composting or yard waste collection programs. Yard waste diversion helps avoid methane generation at landfills, extends a landfill's operable lifetime, and provides opportunities for beneficial reuse of this nutrient-rich organic material.

Rio Vista Sanitation Services provides two free-of-charge pick-ups per year with regular paid garbage service. It will collect up to 12 bags or 12 boxes of garbage or yard debris, not weighing more than 50 lbs. per bag. Additionally, customers can drop off yard waste at Rio Vista Sanitation Services' drop off location at the Rio Vista Corporation Yard.

Participation rates are typically very high throughout the state for residential yard waste collection where green waste bins are provided as part of the regular solid waste collection service. As new development occurs in the community, the city will re-evaluate its franchise waste hauling contract to determine if regular yard waste collection services should be added. At that time, the city should also include residential food scrap and compostable paper collection as part of the green waste bin program, as described in Measure SW-2.1.

Action	Responsibility
A Include yard waste, food scrap, and compostable paper collection services through provision of green waste bins as part of next franchise hauler contract [Same as Measure SW-2.1 Task A]	City Manager; Public Works
B Work with franchise waste hauler to promote use of new green waste bins through a public outreach campaign explaining what items can be placed in the bins, when and how they will be collected, and the benefits of green waste collection	Public Works; Sustainability Coordinator

Progress Indicators	Year
50% of residential units divert 25% of their yard waste through green waste bins or on-site composting; 50% of non-residential properties divert 95% of their yard waste through green waste bins or on-site composting;	2020
90% of residential units divert 95% of their yard waste through green waste bins or on-site composting; 90% of non-residential properties divert 95% of their yard waste through green waste bins or on-site composting;	2035

Measure SW-2.4: Construction and Demolition Waste

2020 GHG Reduction Potential: 25 MT CO₂e/yr

2035 GHG Reduction Potential: 90 MT CO₂e/yr

Enforce construction and demolition waste diversion requirements in State's Green Building Code.



Measure Background

According to CalRecycle's 2008 Statewide Waste Characterization Study, construction and demolition (C&D) materials account for approximately 29 percent of the waste stream in California, including scrap lumber which comprises nearly 15% of the statewide total.^{xiii} Scrap lumber is an organic material, and therefore generates methane emissions through anaerobic decomposition in a landfill. It is also a highly reusable material, which helps conserve virgin natural resources. Many other construction materials can also be diverted from the waste stream for reuse or recycling, including concrete and asphalt, bricks, scrap metal, and drywall.

The California Green Building Code currently requires 50% diversion of C&D materials for all new residential and commercial projects, with few exceptions. CalRecycle provides a list of best practices and other resources on its website to help cities and contractors comply with this requirement. As green building practices become more common in the region, waste haulers and contractors will improve their abilities to divert higher percentages of C&D waste in support of project documentation

requirements for various green building certification programs (e.g., LEED, Green Point Rated).

Implementation and monitoring challenges limit full participation in the state’s C&D diversion efforts, even though the requirements are codified in the Green Building Code. Some communities, such as the City of Fairfield, have adopted formal ordinances establishing diversion thresholds. Others have gone a step further to develop a C&D diversion deposit program, in which the project applicant pays a deposit (as a percentage of total project costs or on a square foot basis) in exchange for a building permit. The deposit is reimbursed to the applicant upon submittal of appropriate documentation showing what level of diversion was achieved by the contractor or waste hauler. The program could also be structured to forgo deposit requirements if applicants provide a signed contract with an authorized C&D collector that clearly states the level of diversion to be achieved.

The city plans to add a C&D ordinance as part of upcoming revisions to the Municipal Code. The city will consider increasing its diversion requirements to 75% of scrap lumber or 75% of total C&D waste as part of future CAP updates, provided that local C&D collectors and area landfills can achieve higher diversion rates. The city will also consider development of a C&D diversion deposit program to ensure compliance with this requirement.

Action	Responsibility
A Adopt construction and demolition (C+D) waste diversion ordinance that requires 50% diversion from qualifying projects; sample ordinance language is provided on CalRecycle website	Building Division
B Consider increasing diversion requirements to 75% diversion by 2020; alternatively, only target scrap lumber with 75% diversion requirement	Building Division
C Consider developing Construction and Demolition Debris Diversion Deposit Program to help enforce C+D ordinance, in which deposit is paid to city prior to issuance of building permit and refunded to applicant following submittal / approval of applicable waste diversion documentation	Building Division; Sustainability Coordinator

Progress Indicators	Year
50% of C&D waste is diverted from 90% of applicable new construction/renovation projects	2020
75% of C&D waste is diverted from 90% of applicable new construction/renovation projects	2035

Green Infrastructure Strategy

Green infrastructure refers to the natural features of a community that also provide an often unnoticed community benefit. In Rio Vista, green infrastructure includes the urban forest, parks, landscaped medians and parkways, and other natural landscapes. These areas can reduce the urban heat island effect, perform stormwater management, and improve air quality and public health.

As one component of the green infrastructure network, urban forests provide shade and can reduce the heat island effect, which causes temperatures to increase in areas with concentrations of exposed pavement and rooftops. These higher temperatures can lead to increased air conditioner use, which increases energy consumption and can strain utility infrastructure at peak hours of the day. Urban forests also provide a visual amenity for residents and habitat value for wildlife.

The city also recognizes other beneficial aspects of trees. Trees beautify neighborhoods, increase property values, reduce noise and air pollution, and create privacy. Additionally, trees gain carbon-sequestering biomass in their trunks and roots as they absorb carbon dioxide from the air to grow. The measure in this section seeks to enhance Rio Vista's already well-established urban forest.

The total GHG emission reduction potential of the Green Infrastructure Strategy is 161 MT CO₂e/yr in 2020. This represents about 1.5% percent of total 2020 reductions anticipated from CAP implementation.

GI 1: Green Infrastructure

Measure GI-1.1: Urban Forest Program

2020 GHG Reduction Potential: **161 MT CO₂e/yr**

2035 GHG Reduction Potential: **328 MT CO₂e/yr**

Support natural carbon sequestration opportunities through development and maintenance of a healthy, vibrant urban forest using outreach, incentives, and strategic leadership.



Measure Background:

Rio Vista's urban forest comprises trees planted on both public and private lands. The city's development standards include parking lot shading requirements. In addition to required tree plantings, private property owners often choose to incorporate trees into their landscaping. Collectively, these trees represent the city's urban forest, and provide

air quality benefits, shading, wildlife habitat, natural stormwater management benefits, visual character, and long-term carbon sequestration.

The city will enforce existing tree-planting requirements for new construction and parking lots, including the new shade tree ordinance described in Measure E-5.1. The city will also identify neighborhood groups and/or urban forestry organizations that can be engaged to help promote a healthy urban forest. These organizations could assist in tree planting campaigns designed to increase the voluntary planting of shade trees or landscape trees. They could also play a role in nurturing new street trees through an adopt-a-tree program to reduce the burden on the Public Works Department. The city could also consider developing a tree protection ordinance requiring the replacement of removed street trees. The city should also revise its tree planting requirements to provide guidance on planting site selection to ensure that tree replacements are appropriately planted to minimize potential root damage to driveways, sidewalks, and underground utilities.

Action	Responsibility
A Amend city's tree planting requirements to require consideration of proper tree siting to avoid sidewalk / utility damage, include recommended tree species list, and tree placement / species selection guidance for various lot sizes	Community Development
B Enforce existing tree-planting requirements for new construction and parking lots, including new shade tree ordinance described in CAP energy measures	Community Development; Sustainability Coordinator
C Advertise shade-tree-giveaway programs or other incentives, when available	Community Development; Sustainability Coordinator
D Consider developing tree protection ordinance that requires replacement of removed street trees	Community Development

Progress Indicators	Year
1,300 new trees planted in the community	2020
2,600 new trees planted in the community	2035

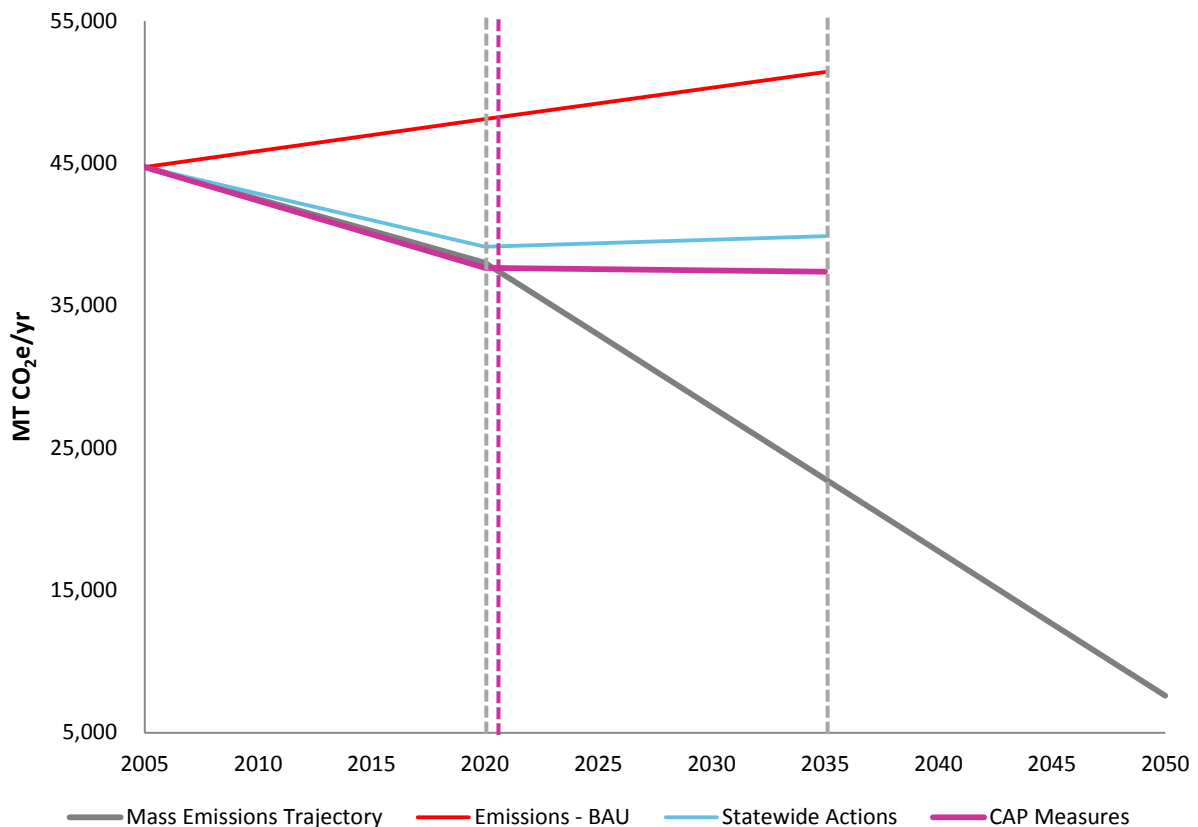
Target Achievement

PROGRESS TOWARD 2020 TARGET

The measures described above, combined with the state actions described in Chapter 2, have the potential to reduce communitywide emissions by 10,448 MT CO₂e/yr from projected 2020 levels. Collectively, these actions **achieve** the city's 2020 reduction target of 15% below 2005 levels. Estimated reductions described throughout this CAP would result in achievement of a 15.8% reduction below baseline emissions.

Figure 3.2 shows the additive impact of statewide actions and local actions that achieve the city's 2020 target. Business-as-usual emissions forecast through 2035 are shown in red. The impact of known and quantifiable statewide actions is shown in blue, with the local actions of this CAP's measures shown in fuchsia. The vertical dashed gray lines mark the 2020 and 2035 horizon years. As shown, the combination of statewide and local actions reduces the city's emissions below the solid gray target line in 2020, indicating target achievement. The vertical dashed fuchsia line marks where the city's emissions are estimated to increase above the long-term target trajectory line; this occurs in approximately 2020. Beyond that date, statewide actions and these CAP measures no longer keep up with projected emissions growth.

Figure 3.2 – 2020 Target Achievement



PROGRESS TOWARD 2035 TARGET

As shown in Figure 3.2, the city will not achieve a 2035 target with the identified statewide and local measures alone. Emissions reductions totaling 28,611 MT CO₂e/yr would be required to achieve the 2035 target (i.e., 49% below 2005 levels). However, this CAP estimates future reductions of only 13,923 MT CO₂e/yr in 2035, or 16.2% below baseline.

Several variables will influence the city's ability to achieve future longer-term targets. First, statewide actions, which provide the majority of reductions in this CAP, are shown to flat-line beyond the 2020 horizon year. This is due to the fact that the Scoping Plan has only quantified the impacts of statewide actions through 2020. While the 2008 Scoping Plan has been revised, the new and revised actions included therein have not yet been quantified, so local governments are not yet able to take credit for the local share of those actions. It is likely that the state will continue to develop actions and programs that will support achievement of its 2050 statewide reduction target. However, at this time the potential future impact of those actions is unknown.

Second, new technologies that support additional emissions reduction may be developed between now and 2035. Existing technologies may also become more effective or financially viable for increased implementation. One example is the cost and ubiquity of solar photovoltaic panels, which have experienced exponential market growth during the last few decades. Increased renewable energy development could be a large source of future emissions reductions.

Third, additional local CAP measures may be developed during future plan updates, or CAP measures may be implemented at higher rates than previously estimated. The 2035 reduction estimates are based on the best available data and assumptions, but the future is difficult to predict accurately. Regular emissions inventory updates will be the best predictor of future target achievement, and will help the city to identify emissions sectors that need additional attention.

Fourth, and final, future target achievement is based on numerous growth estimates, which may or may not be accurate in reality. If the city grows faster than anticipated in the emissions inventories, it will become harder to achieve long-term targets without deeper implementation of CAP measures. However, if the city grows more slowly, so too will its emissions, potentially making future targets easier to achieve.

LONG-TERM REDUCTION OPPORTUNITIES

As part of the CAP development process, the participating cities considered several measure options that would provide long-term reduction opportunities, but would also require regional collaboration for successful implementation. These additional measures could be applied to the estimated statewide and local actions included in this CAP to demonstrate a pathway towards future target achievement. However, these options were not developed with the same level of detail as the local CAP measures included in this chapter, and are provided here for informational purposes only. Rough estimates of future emissions reduction potential were calculated using readily-available data and studies. Additional analysis would be required to ensure their feasibility for local implementation.

These measures were included here so that conversations with regional partners and local residents can begin early, with the hope that some or all of the measures are ready to begin implementation by 2020.

PG&E Green Option

2035 Reduction Potential (Municipal): 287 MT CO₂e/yr

PG&E is in the process of finalizing its proposed Green Option Program, which would allow customers to voluntarily purchase 100% renewable electricity. The California Public Utilities Commission (CPUC) will respond to PG&E's proposed program by July 1, 2014. If approved, PG&E expects the program to be available for subscription within a few months following approval. The program is currently expected to be capped at 125 MW of demand and for a five-year pilot program. It is currently unknown how participation will be granted should the program become fully-subscribed.

The city could consider participating in this program so that 100% of municipal electricity is generated from renewable sources. Though municipal emissions only represent a fraction of total communitywide emissions, this program provides an opportunity to demonstrate regional leadership in emissions reductions. Residents and local businesses will also be able to voluntarily participate in this program. A similar program offered by the Sacramento Municipal Utility District currently has an approximately 10% voluntary participation rate.

City Actions to Consider

- + Review participation costs with regards to municipal electricity expenses when final program information is available
- + Evaluate benefits to city's participation

Community Choice Aggregation

2035 Reduction Potential (75% participation): 3,890 MT CO₂e/yr

This option is included above as a stand-alone measure to highlight its importance for long-term target achievement. As described in Measure E-7.5, community choice aggregation allows a city or cities to supply electricity to customers within their borders through the establishment of a CCA. Solano County included a measure in their CAP to explore development of a CCA in partnership with the county's cities. CCA's are typically designed as an opt-out program, which means that all residents and businesses within its boundaries are automatically enrolled in its service with the ability to opt out and remain with PG&E as their utility provider. This type of enrollment is one reason that CCA programs enjoy high participation rates. For example, Marin Clean Energy began serving customers in May 2010, and currently procures electricity for 75% of electric customers in Marin County.

The city could consider participating in regional conversations regarding opportunities and challenges to establishing a Solano County CCA.

City Actions to Consider

- + Collaborate with regional partners to evaluate feasibility for CCA development (e.g., start-up costs, funding sources, legal considerations, participation estimates)

Alternative Fuel Vehicles

2035 Reduction Potential: 2,994 MT CO₂e/yr

Advancements in alternative fuel vehicle technologies make long-term market adoption seem likely. As described in Measure T-4.1 above, there are actions the city can take to facilitate this market transition, including pre-wiring requirements in new construction for electric vehicle charging stations, pursuit of grant funding to install public charging infrastructure, and collaboration with STA and local cities on development of a CNG refueling station. The reduction potential shown above is dependent upon decreasing vehicle costs resulting from further technological advancement and increasing market adoption that brings to bear economies of scale in automotive manufacturing. This estimate includes a transition away from gasoline and diesel vehicles to plug-in hybrid electric vehicles, battery-electric vehicles, and compressed natural gas vehicles throughout the range of vehicle class categories (e.g., passenger cars, light duty trucks, buses).

As the use of electric vehicles increases, it will become more important to clean the electricity grid in order to maximize the emissions reductions associated with alternative fuel vehicles.

City Actions to Consider

- + Research best-practices in facilitating market shift towards alternative fuel vehicles through local policies
- + Participate in regional collaboration on CNG refueling station
- + Explore opportunities to convert Ready-Ride vehicles to alternative fuel vehicles

Advanced Methane Capture

2035 Reduction Potential (95% capture): 1,110 MT CO₂e/yr

The city could explore opportunities with their franchise waste hauler to send the community's solid waste to a landfill facility with a highly-efficient methane control system. These advanced systems can capture 90-95% of fugitive methane emissions, significantly reducing solid waste emissions. A variety of factors should be considered before pursuing this option. The city should work with their franchise waste hauler to identify nearby landfills that have advanced methane capture systems and capacity to accept new customers. The cost premium of shipping to such a facility should also be considered, particularly as compared to the amount of emissions that could potentially be reduced. Further analysis may indicate that this option is either technically or financially infeasible.

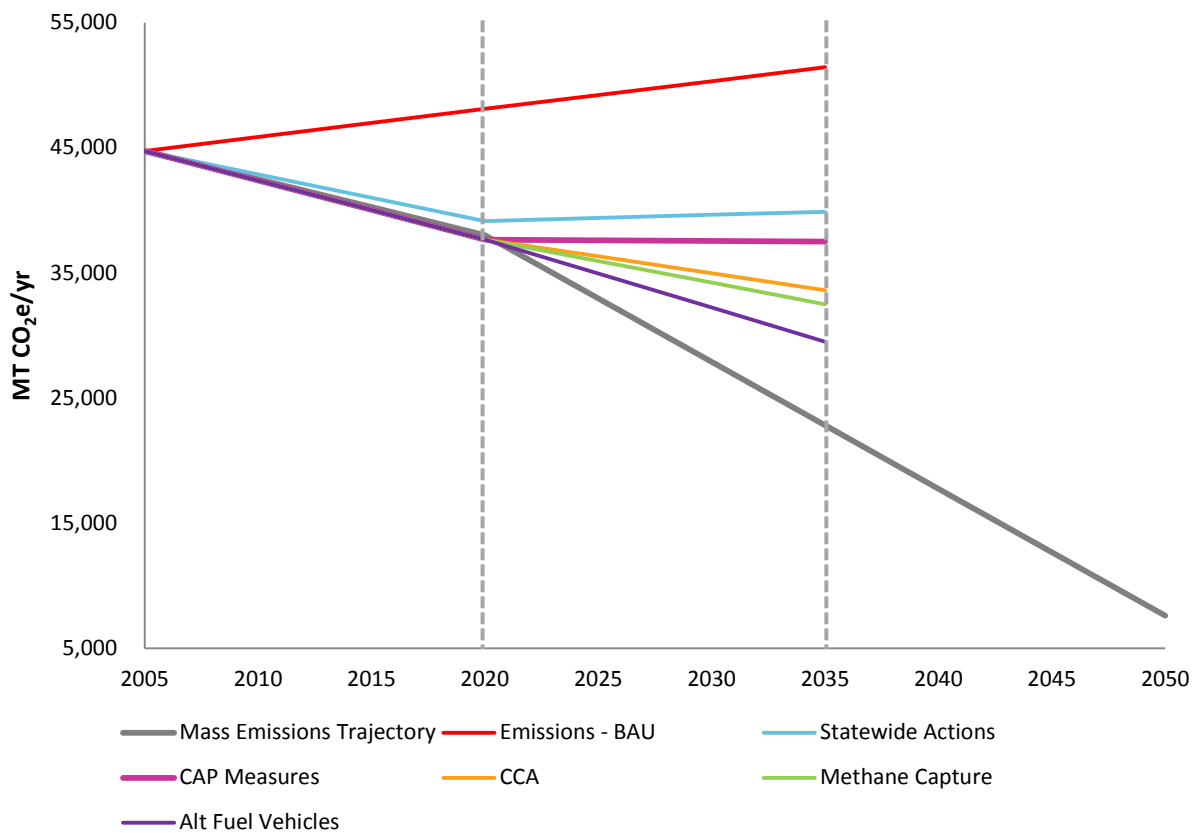
City Actions to Consider

- + Identify area landfills with advanced methane capture systems
- + Discuss potential costs with franchise waste haulers
- + Further analyze emissions reduction potential; compare to future emissions reduction gap and potential costs

Figure 3.3 shows that development and implementation of these measures (excluding the PG&E Green Option to avoid double-counting with the CCA program) would bring the city closer to achieving the 2035 target. Combined with the reduction estimates in Table 3.1, these measures would bring total reductions to 21,917 MT CO₂e/yr in 2035, which is 34.0% below 2005 levels. Though a gap of 6,694 MT CO₂e/yr still exists, the target could yet be achieved based on the earlier description of unknown variables influencing longer-range reduction targets.

At the very least, Figure 3.3 provides a framework to demonstrate what it will take to mirror the state's aggressive long-range targets at the local level. The largest reduction opportunities known at this time are likely to come from cleaner electricity sources and a large-scale shift towards alternative-fuel vehicles.

Figure 3.3 – Long-Term Reduction Options



Notes

ⁱ US Census, 2010.

ⁱⁱ PG&E, 2012. Available at:
http://www.pgecorp.com/sustainability/en03_clean_energy.jsp.

ⁱⁱⁱ US Census, 2010.

^{iv} California Energy Commission. *2009 California Residential Appliance Saturation Study*. Prepared by KEMA, October 2010.

^v Ibid.

^{vi} National Renewable Energy Laboratory Renewable Resource Data Center, 2011.

^{vii} PG&E. *PG&E Generation Interconnection Services Progress Report for Rio Vista*. October 2012.

^{viii} California Energy Commission. *Solar Water Heating CEC 2013 Title 24 Pre-rulemaking Workshop*. June 9, 2011.

^{ix} PG&E, October 2012.

^x PG&E. *Case Study: Fairfield Suisun Sewer District Integrated Energy Management*. August 2009.

^{xi} Campbell's Soup, 2012. Available at:
http://csr.campbellsoupcompany.com/csr/pages/resources/reports-and-data.asp#UxTKgvldV_4.

^{xii} California Integrated Waste Management Board. *California 2008 Statewide Waste Characterization Study*. Prepared by Cascadia Consulting Group, August 2009. Available at: <http://www.calrecycle.ca.gov/Publications/Documents/General/2009023.pdf>.

^{xiii} Ibid.

CHAPTER 4

BENCHMARKS + IMPLEMENTATION

4

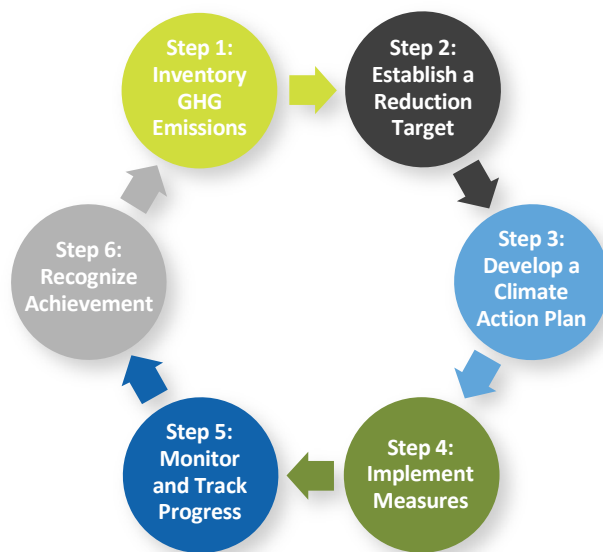
This chapter describes how city staff will implement CAP measures and related actions, and track the performance metrics identified for each measure as part of the larger Regional CAP Program. The chapter also discusses the need to evaluate, update, and amend the CAP over time, so the plan remains effective and current. Using the CAP to evaluate future project consistency is presented with regards to mandatory and voluntary nature of the CAP's measures. Lastly, the chapter gives an overview of potential funding sources to support CAP implementation. While funding sources are continually evolving, this section presents types and sources of funding that are currently, or known to be regularly, available in order to help focus the city's effort.

Implementation and Monitoring

Ensuring that the CAP measures translate from policy language into on-the-ground results is critical to the success of the plan. To facilitate this, each measure described in Chapter 3 contains a table that identifies specific actions which the city will carry out, and the departments responsible for each action. Each table also provides performance metrics to enable city staff, the City Council, and the public to track measure implementation and monitor overall CAP progress. The tables provide both interim (2020) and final (2035) performance metrics. Interim performance metrics are especially important, as they provide checkpoints to evaluate if a measure is on the right path to achieving its GHG reductions.

Figure 4.1 was presented in Chapter 1 to describe the first three steps in the CAP development process. This chapter describes strategies to approach Steps 4 and 5, which cover the implementation and monitoring process.

Figure 4.1 – Steps in the CAP Development Process



PERFORMANCE METRICS

The performance metrics are directly related to the estimated GHG emissions reductions. Therefore, they are written to provide a quantifiable measurement to accurately track progress toward the reduction target. For example, Measure E-7.1 encourages voluntary installation of rooftop solar photovoltaic systems. The measure’s estimated GHG emissions reductions are based on numerous assumptions, including the number of residential and commercial buildings that will install solar photovoltaics between 2005 and the 2020 and 2035 target years (including those that have already installed systems since 2005). The performance metric assumes that 340 single-family residential buildings will include a 4.5 kW solar PV system by 2020 (in addition to those

already existing in the 2005 baseline year). If there is greater adoption of solar photovoltaics than estimated in this measure, then additional emissions reductions will occur. Likewise, if installations fall short of the estimates described here, then this measure will achieve less than its stated reductions. Participation rate assumptions are described in Appendix C.

STAFFING AND COORDINATION

Upon adoption of the CAP, the city departments identified for each measure in Chapter 3 will become responsible for implementing assigned actions. Key staff in each department will facilitate and oversee this work, working in tandem with the proposed regional Sustainability Coordinator. To assess the status of city efforts, CAP plan implementation meetings should take place several times a year. Some actions will require inter-departmental or inter-agency cooperation, and appropriate partnerships will need to be established.

REGIONAL CLIMATE ACTION PLANNING PROGRAM COORDINATION

This CAP was developed in tandem with three other Solano County cities as part of a Regional Climate Action Planning Program. To ensure an approach that is mutually beneficial and efficient, measures and actions were developed with regional relevance. Table 4.1 provides a summary of the measures identified in Chapter 3 as candidates for regional implementation. These measures have the potential to save city resources and effort when coordinated and implemented regionally. Appendix E presents the full list of regional implementation opportunities that were considered, including a comparison to the adopted CAPs of Solano County and the Cities of Benicia and Vallejo.

The primary option for developing and managing a successful regional strategy is to establish the role of Sustainability Coordinator (see Measure CC-1.1 in Chapter 3) to facilitate this process, either at the city-level or as a regional position housed within a county agency. This person would have the ability to work with the participating cities on implementation of regional measures, as well as coordinate with Solano County and city staff from Benicia, Vallejo, and Vacaville on countywide programs. Additional funding would be needed to support development of regionally applicable outreach campaigns and shared resources, such as a Solano County Sustainability Website (see Measure CC-1.2 in Chapter 3).

**Table 4.1
Regional Implementation Measures**

CROSS-CUTTING STRATEGY		CITIES¹	RESPONSIBILITY
CC-1.1	Sustainability Coordinator	All	Community Development; Solano EDC
CC-1.2	Public Outreach	All	Community Development; Sustainability Coordinator
ENERGY STRATEGY		CITIES	RESPONSIBILITY
E-1. Existing Buildings			
E-1.1	Energy Efficiency Retrofit Outreach	All	Sustainability Coordinator; Community Development; Building Division
E-1.2	Energy Efficiency Audits	All	Solano Center for Business Innovation; Sustainability Coordinator; Community Development
E-3. Financing			
E-3.1	Energy Efficiency Rebate Program	All	Sustainability Coordinator; Community Development
E-3.2	PACE Financing Program	All	Solano Center for Business Innovation; Building Division
E-4. Building Appliances			
E-4.1	ENERGY STAR Appliances	All	Sustainability Coordinator; Community Development; Building Division
E-4.2	Smart Grid	All	Building Division; Sustainability Coordinator
E-6. Building Lighting			
E-6.1	Building Lighting Efficiency	All	Building Division; Sustainability Coordinator
E-7. Renewable Energy			
E-7.3	District Energy Systems	Dixon, Fairfield, Suisun City	Solano EDC; Sustainability Coordinator; Community Development; Building Division; Public Works
E-7.4	Community Choice Aggregation	All	Sustainability Coordinator
E-8. Street and Area Lighting			
E-8.1	Street Light Upgrade	Dixon, Rio Vista, Suisun City	Public Works
E-9. Municipal Actions			
E-9.1	Municipal Renewable Energy Development	Dixon, Fairfield, Rio Vista	Solano EDC; Sustainability Coordinator; Community Development; Public Works
TRANSPORTATION + LAND USE STRATEGY		CITIES	RESPONSIBILITY
T-1. Pedestrians + Bicycles			
T-1.3	Bicycle Outreach Program		T-1.3
T-4. Alternative Fuels			
T-4.2	Municipal Alternative Fuel Vehicles		T-4.2

SOLID WASTE STRATEGY		CITIES	RESPONSIBILITY
SW-1. Waste Reduction			
SW-1.3	Source Reduction Program	All	Sustainability Coordinator; Solano Center for Business Innovation
SW-2. Organic Waste Diversion			
SW-2.1	Residential Food Scrap and Compostable Paper Diversion	All	Sustainability Coordinator; City Manager's Office
SW-2.2	Commercial Food Scrap Collection	All	Sustainability Coordinator
SW-2.3	Yard Waste Diversion	All	Sustainability Coordinator
GREEN INFRASTRUCTURE STRATEGY		CITIES	RESPONSIBILITY
GI-1. Green Infrastructure			
GI-1.1	Urban Forest Program	All	Sustainability Coordinator; Community Development

Note:

¹ The designation of All Cities includes Dixon, Fairfield, Rio Vista, and Suisun City

Program Evaluation and Evolution

The CAP represents the city's initial attempt to create an organized, communitywide plan to reduce GHG emissions. City staff will need to evaluate the plan's performance over time, and be ready to alter or amend the plan in the future if it is not on track to achieve its reduction targets.

PROGRAM EVALUATION

Two types of performance evaluation are important:

- (1) Evaluation of the community's overall ability to reduce GHG emissions, and
- (2) Evaluation of the performance of individual CAP measures.

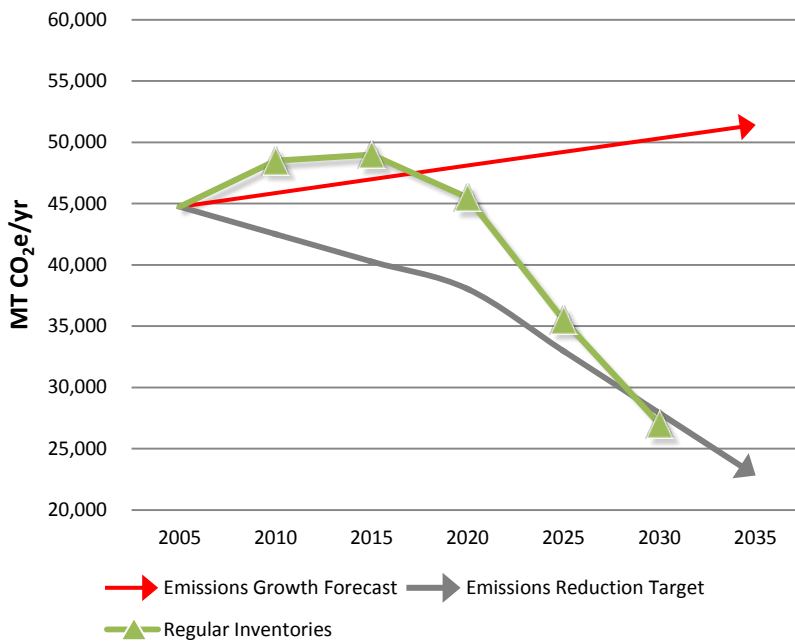
GHG Inventory Updates

Regular communitywide GHG emission inventories will provide the best indication of CAP effectiveness. It will be important to reconcile actual growth in the city versus the growth projected when the CAP was developed. Conducting these inventories periodically will enable direct comparison to the 2005 baseline inventory and will demonstrate the CAP's ability to achieve the adopted reduction target.

The Community Development Department, in conjunction with the proposed Sustainability Coordinator, will prepare communitywide inventories every three to five years following adoption of the CAP to assess progress toward the GHG emissions reduction targets. Figure 4.2 gives an example of how regular communitywide inventories can help track progress toward the reduction targets compared to the

business-as-usual emissions forecasts. In the hypothetical scenario shown, communitywide emissions actually increase through 2015 before they start declining to achieve the long-term reduction target. This type of communitywide overview is the easiest way to determine if the CAP measures are being effectively implemented.

Figure 4.2 – Example of Future Emissions Inventory Monitoring



Source: AECOM 2014

CAP Measure Effectiveness

While communitywide inventories provide information about overall emission reductions, it will also be important to understand the effectiveness of each measure. Evaluation of the emissions reduction capacity of individual measures will improve staff and decision makers' ability to manage and implement the CAP. The city can reinforce successful measures and reevaluate or replace under-performing ones. Evaluating measure performance will require data regarding actual community participation.

Applying the Measure Tracking Template

Table 4.2 provides an example of a measure tracking template that could be used to monitor the efficacy of each CAP measure. The table is similar to the measure tables included in Chapter 3, but has been expanded to include phasing and tracking mechanisms. The phasing column allows each responsible department or agency to identify internal timelines for implementing specific action steps. These could be expressed as specific target years or more generally as short-, medium-, and long-term actions. The tracking mechanisms specify how implementation of the progress indicators will be monitored. Similar to the future communitywide inventories, the progress indicators should be evaluated regularly to ensure each measure is on track to achieve its stated emissions reductions. If during the implementation review process a measure is found to be falling short of its performance targets, then additional attention

can be given to modifying the implementation strategy. If implementation review indicates that a measure will be unable to achieve its stated reduction level, then additional CAP measures could be developed to make up the difference or other measures could be enhanced to increase their reduction potential. For this reason, CAP implementation should be an iterative process to reflect future changes in the city.

Monitoring Statewide Actions

Similar to the local measures described in this CAP, program evaluation should also include monitoring statewide actions addressing climate change; particularly those actions for which an emissions reduction was calculated and counted in the city's progress toward its reduction targets (see Table 2.4 in Chapter 2). The city should work with the Sustainability Coordinator to track implementation of statewide actions to ensure that estimated reductions actually occur. New statewide actions may also be established in the future that will result in additional local emissions reductions. These new actions should be incorporated into a future CAP revision, and would further reduce the burden on implementing local actions.

Reporting Schedule

The proposed Sustainability Coordinator and responsible departments and agencies will evaluate measure performance on the same schedule as the communitywide inventories following adoption of the CAP, and summarize progress toward the GHG reduction target in a report that describes estimated annual GHG reductions in 2020, achievement of performance metrics, participation rates (where applicable), and remaining barriers to implementation.

The proposed Sustainability Coordinator (or delegated city staff) will report progress on the CAP action items to decision-makers on an annual basis. Staff will deliver this report in conjunction with the state-required annual report to the City Council regarding implementation of the city's General Plan. The progress report will include a cursory assessment of progress and implementation of individual CAP measures, including how new development projects have incorporated relevant measures. The progress report will also identify measure gaps and recommend corrections.

Table 4.2
Measure Implementation Tracking Template

MEASURE E-7.1 SOLAR PHOTOVOLTAIC SYSTEMS

Facilitate the voluntary installation of solar PV systems on residential and nonresidential buildings.

Action	Responsibility	Phasing
A Review/revise all applicable building, zoning, and other codes and ordinances to identify and remove potential regulatory barriers to the installation of solar PV or solar hot water systems in residential and nonresidential construction.	Building Division; Planning Division; Sustainability Coordinator	Establish an internal target date or timeframe for implementing each action. (e.g., Short-Term, Medium-Term, Long-Term, or specific target years)
B Provide priority permitting for building-scale renewable energy projects.	Building Division; Planning Division; Sustainability Coordinator	
C Reduce solar PV permitting fees.	Building Division; Planning Division; Sustainability Coordinator	

Progress Indicators	Year	Tracking Mechanisms
340 single-family units install 4.5kW PV system	2020	Collect information from building permit data and analyze to gauge progress towards indicator targets: <ul style="list-style-type: none"> • How many single family homes installed PV systems in each year, and at what total new capacity? • What was the total new installed PV capacity for multi-family and nonresidential buildings in each year? • What was the total new combined installed PV capacity in each year?
675 single-family units install 4.5kW PV system	2035	

PROGRAM EVOLUTION

To remain relevant, the city must be prepared to adapt and transform the CAP over time. It is likely that new information about climate change science and risk will emerge, new GHG reduction technologies and innovative municipal strategies will be developed, new financing will be available, and state and federal legislation will change. It is also possible that future inventories will indicate that the community is not achieving its adopted target. As part of the evaluations identified above, the city will assess the implications of new scientific findings and technology, explore new opportunities for GHG reduction, respond to changes in climate policy, and incorporate these changes in future updates to the CAP to ensure an effective and efficient program.

Project Consistency with CAP

The CAP identifies both mandatory and voluntary GHG reduction measures that would apply to different types of future projects.

MANDATORY MEASURES

For each of the following mandatory measures, the CAP either reinforces the implementation of current codes, ordinances, and state legislation, or directs changes to the city's codes and ordinances that would result in GHG reductions. All new projects would be required to comply with these codes and ordinances, as applicable:

- + Measure E-2.2: Solar Ready Construction
- + Measure E-5.1: Building Shade Trees
- + Measure T-1.1: Pedestrian Environment Enhancements
- + Measure T-4.1: Alternative Fuel Vehicles
- + Measure T-5.1: Demand Management Program
- + Measure W-1.1: SB-X7-7
- + Measure SW-1.2: Commercial Recycling Program
- + Measure SW-2.4: Construction and Demolition Waste
- + Measure GI-1.1: Urban Green Forest Program

VOLUNTARY MEASURES

The remaining measures are essentially voluntary, relying on assumed levels of community participation to create communitywide GHG reductions. These measures will be tracked to ensure participation rates are reached and that the voluntary measures are being adequately applied to new and existing projects. If voluntary implementation is found to fall short of the CAP's reduction targets, then additional, more aggressive actions may be necessary to correct shortfalls.

Funding Sources and Financing Mechanisms

This section describes potential funding sources and financing mechanisms that Rio Vista could pursue to offset the financial burden of implementing the CAP measures described in Chapter 3. Each measure is accompanied by an analysis of costs and savings, and potential funding sources, financing strategies, and partnership opportunities.

The spectrum of public and private funding options for the measures outlined in this CAP is ever evolving. This section outlines viable funding options that are current, but could eventually become out of date. However, there are general sources of funding that provide the most up-to-date information, including:

- + U. S. Department of Energy (DOE)
- + Environmental Protection Agency (EPA)
- + US Department of Housing and Urban Development (HUD)
- + California Energy Commission (CEC)
- + California Infrastructure and Economic Development Bank
- + Metropolitan Transportation Commission (MTC)
- + Association of Bay Area Governments (ABAG)
- + Pacific Gas & Electric (PG&E)
- + Yolo Solano Air Quality Management District (YSAQMD)

COSTS + SAVINGS

The city is not the only entity bearing financial responsibility for implementing for CAP measures; there will be a private cost borne by residents and businesses for specific measures. In recognition of this, a costs and savings analysis was performed for each measure to evaluate the cost to the city, as well as potential costs and savings to residents or property owners. A summary of this analysis can be found in Chapter 3, with analytical background information provided in Appendix B. Generally, the implementation costs to the city for the creation of programs, which consist primarily of initial start-up costs and ongoing administration/enforcement costs, range considerably from negligible additional costs to on the order of several hundred thousand dollars.

Measures vary in the distribution of costs. Some measures require only funding from the city or other public entities, whereas others require that residents and businesses contribute. In nearly all measures that require some investment by residents or business owners, there are substantial long-term savings that will allow recuperation of initial investments, as well as other benefits such as improved air quality or publicly-owned spaces such as streetscapes, open spaces, rights-of-way, etc. There are also measures that require no private investment, but generate savings for the resident or business owner.

FUNDING STRATEGY

The CAP will require strategic public funding by the city, regional government agencies, and the state government for capital projects, incentives, outreach/education, and new regulations necessary to achieve the plan's objectives. To decrease costs and improve the plan's efficiency, actions should be pursued concurrently whenever possible. For example, the city should pursue land use and transportation-related actions together during upcoming General Plan updates and in the development of Specific Plans. The city could also look to address water- and wastewater-related measures with the related utilities and agencies (e.g., water districts); inter-agency collaboration will be paramount to the success of the CAP.

Funding sources have not been identified for all actions; however, numerous federal, state, and regional grants are available to assist with funding. More details on these programs and others follow in the subsequent sections.

Additionally, Rio Vista should partner with nearby cities and jurisdictions to administer joint programs when feasible. As many businesses in Solano County and the Bay Area

are leaders in resource efficiency, renewable energy, and green infrastructure, potential opportunities exist to partner with the private sector to decrease implementation costs. Finally, many of the measures and actions have the potential to be self-financing if properly designed and implemented.

FUNDING AND FINANCING SOURCES

Transportation-Related Incentives and Programs

Many state and regional grant programs are available to fund transportation and infrastructure improvements. The programs listed below represent the current status of the most relevant of these programs. It is, however, important to evaluate the status of a given program before seeking funding, as availability and application processes are updated periodically.

MTC Livable Communities & Housing Incentive Program

The purpose of MTC's Transportation for Livable Communities (TLC) Capital and Planning Program is to support community-based transportation projects that bring new vibrancy to downtown areas, commercial cores, neighborhoods, and transit corridors by enhancing their amenities and ambiance and making them places where people want to live, work, and visit. TLC provides funding for projects that are developed through an inclusive community planning effort, provide for a range of transportation choices, and support connectivity between transportation investments and land uses.

As part of the TLC program, the Housing Incentive Program (HIP) rewards local governments that build housing near transit stops. The key objectives of this program are to:

- + Increase the housing supply in areas of the region with existing infrastructure and services in place
- + Locate new housing where non-automotive transportation options are viable transportation choices
- + Establish the residential density and ridership markets necessary to support high-quality transit service

HIP funds are intended for transportation capital projects that support TLC goals, such as pedestrian and bicycle facilities that connect housing projects to adjacent land uses and transit; improved sidewalks and crosswalks linking housing to a nearby community facility, such as a school or public park; or streetscape improvements that support increased pedestrian, bicycle, and transit activities and safety.

MTC Transit-Oriented Development Policy

To promote cost-effective transit, ease regional housing shortages, create vibrant communities and preserve open space, MTC has adopted a Transit-Oriented Development (TOD) policy that will be applied to transit extension projects in the Bay Area. MTC's TOD policy includes three key elements:

- + Corridor-based performance measures to quantify minimum thresholds of development around transit stations, based on the transit mode; higher thresholds with more capital-intensive modes, such as BART.

- + Aid for funding Station Area Plans (SAPs) to promote a jobs and housing balance, station access, design standards, parking and other amenities based on unique circumstances, and community character.
- + Creation of corridor working groups to bring together local government staff, transit agencies, county congestion management agencies (CMAs) and other key stakeholders along the corridor to help develop station area plans to meet MTC's corridor-wide land-use thresholds.

As this policy is still in development, the city should keep track of its progress and applicability to the CAP.

YSAQMD Clean Air Funds

The state legislature has authorized YSAQMD to collect a \$4 surcharge on motor vehicle registration, to be used to fund clean air programs in the District' boundaries. In addition, YSAQMD receives funds from a special property tax (AB 8) generated from Solano County properties located within the Districts' boundaries. These programs are jointly referred to as YSAQMD Clean Air Funds. In the past, these funds have gone to projects such as:

- + Solano Napa Commuter Information (SNCI) ridesharing program,
- + electrical vehicle charging station installation,
- + signal light prioritization for transit vehicles near major transit hubs,
- + vehicle replacement,
- + public education and outreach, and
- + projects such as the Rio Vista Waterfront Promenade Phase 1.

YSAQMD and STA created a screening committee to make recommendations on projects in Solano County. For 2014, the YSAQMD Clean Air Fund estimate is \$442,080. As with other fund sources, STA will evaluate all applications, but anticipates giving priority consideration to projects or programs that are contained in adopted STA countywide plans such as the Alternative Fuels, Bicycle, and Safe Routes to Schools plans.

ABAG / MTC FOCUS Program: Station Area and Priority Development Area Grants

(<http://www.bayareavision.org/initiatives/prioritydevelopmentareas.html>).

As outlined in MTC's Transit-Oriented Development Policy, future transit extensions in the Bay Area must be matched by supportive local land use plans and policies. To assist cities in meeting these goals, MTC launched a Station Area Planning grant program in 2005 to fund city-sponsored planning efforts for the areas around future stations and priority development areas identified by ABAG. These station-area and land-use plans are intended to address the range of transit-supportive features that are necessary to support high levels of transit ridership.

CALTRANS Planning Grants

Community Based Transportation Planning (CBTP) grants fund transportation and land use planning that promotes public engagement, livable communities, and a sustainable transportation system (e.g., mobility, access, and safety). The maximum award is \$300,000, and a local match of 20 percent of the grant request is required.

Safe Routes to Schools

Safe Routes to Schools is an international movement focused on increasing the number of children who walk or bicycle to school by funding projects that remove barriers to doing so. These barriers include lack of infrastructure, safety, and limited programs that promote walking and bicycling through education/ encouragement programs aimed at children, parents, and the community. In California, two separate Safe Routes to School programs are available: the State program referred to as SR2S, and the federal program referred to as SRTS; both fund qualifying infrastructure projects.

Energy-Related Incentives and Programs

Many of the financing and incentive programs relevant to the CAP concern energy infrastructure and conservation. Some of these programs are tied to the ARRA economic stimulus package enacted by Congress in February 2009, and may no longer be available. Access to these funds will be available for a limited period, and the city should seek the most up-to-date information regarding the programs listed below.

Energy Upgrade California

www.energyupgradecalifornia.com/

www.acgreenretrofit.org/

Energy Upgrade California is a program under the State Energy Program (SEP), which is administered by the CEC. The purpose of the Program is to create jobs and stimulate the economy through a comprehensive program to implement energy retrofits in existing residential buildings. The Program will focus on deploying re-trained construction workers and contractors, and youth entering the job market to improve the energy efficiency and comfort of California's existing housing, creating a sustainable energy workforce in the process.

The Association of Bay Area Governments (ABAG) administers this region-wide energy retrofit program for residential home energy retrofits. Across the Bay Area, this program is targeted to achieve energy efficiency upgrades in up to 15,000 single family and 2,000 multi-family residences.

The program is designed to:

- + Establish sets of verifiable retrofit standards for energy efficiency and other green improvements that are easy for building owners and contractors to understand
- + Train contractors to implement these standards in their retrofit projects
- + Create quality assurance procedures to help ensure that retrofit work meets program requirements and performance expectations
- + Offer financing for eligible improvements through California FIRST
- + Bundle potential rebates and other incentives to make them more accessible to property owners
- + Conduct a countywide marketing and public outreach campaign to get the word out to property owners and building industry contractors about best practices for energy efficiency and green retrofits, as well as financing and incentive opportunities.

Flex Your Power

www.fypower.org

Initiated in 2001, Flex Your Power is a partnership of California's utilities, residents, businesses, institutions, government agencies and nonprofit organizations working to save energy. The campaign includes a comprehensive website, an electronic newsletter and blog, and educational materials. The website provides regularly updated information on financial incentives and technical assistance for energy-efficient appliances, equipment, lighting and buildings. This information is available for residential, commercial, industrial and institutional consumers.

As existing programs evolve and new programs are created, Flex Your Power is a clearinghouse for information. Current incentives listed include:

- + The California Preschool Energy Efficiency Program (CPEEP) provides child care facilities with energy audits and retrofits.
- + The Enhanced Automation Initiative (EAI) pays large commercial and institutional customers to improve energy efficiency of existing building automation systems or energy management systems.
- + The School Energy Efficiency program (SEE) provides cash incentives for installing a variety of energy efficiency measures.
- + The Savings by Design program provides design assistance and financial incentives to commercial, industrial, institutional and agricultural building owners and design teams to promote energy efficient design and construction practices.

California Solar Initiative

www.gosolarcalifornia.org/csi/index.php

The California Solar Initiative (CSI) is the solar rebate program for California consumers who are customers of investor-owned utilities, such as PG&E. The CSI Program pays solar consumers an incentive based on system performance. For existing homes, existing or new commercial, agricultural, government, and non-profit buildings, this program funds both solar photovoltaics (PV), as well as other solar thermal generating technologies. Additionally, for homes and businesses, this program funds solar hot water systems. An additional rebate is available for single-family homes owned by low-income residents or multi-family affordable housing.

The CSI solar incentives differ by customer segment and size, and are intended to encourage high performing systems. There are two types of incentives available through the CSI program: Expected Performance-Based Buydown (EPBB) and Performance-Based Incentives (PBI). EPBB is a one time, up-front payment based on an estimate of the system's future performance. For solar projects with a system larger than 30 kW, PBI are monthly payments for 5 years based on actual performance (output) of the system. The incentive rate is based on the incentive type—EPBB or PBI, and the relevant customer segment—residential, commercial or government/non-profit and current incentive step.

The CSI solar thermal hot water program will run for eight years, ending on December 31, 2017. To qualify of the CSI-Thermal rebate amounts differ by customers' system size, class (e.g., residential or commercial) and water heating fuel source (e.g., gas or electric).

California Feed-In Tariff

www.cpuc.ca.gov/PUC/energy/Renewables/hot/feedintariffs.htm

The California feed-in tariff allows eligible customer-generators to enter into 10-, 15- or 20-year standard contracts with their utilities to sell the electricity produced by small renewable energy systems -- up to 3 megawatts (MW) -- at time-differentiated market-based prices. Time-of-use adjustments will be applied by each utility and will reflect the increased value of the electricity to the utility during peak periods and its lesser value during off-peak periods. These tariffs are not available for facilities that have participated in the California Solar Initiative (CSI), Self-Generation Incentive Program (SGIP), Renewables Portfolio Standard, or other ratepayer funded generation incentive programs, including net-metering tariffs.

For customers generating renewable energy not covered by the CSI or SGIP (e.g., biomass or geothermal) the feed-in tariff is applicable. If customers prefer a long-term contract at a fixed price over a financial incentive paid in the short term, feed-in tariffs may be a beneficial financing tool.

California Energy Commission Energy Efficiency Financing

<http://www.energy.ca.gov/efficiency/financing/index.html>

The California Energy Commission offers low-interest loans for public institutions to finance energy-efficient projects. Interest rates are currently at 3%. Projects with proven energy and/or capacity savings are eligible, provided they meet the eligibility requirements. Examples of projects include:

- + Lighting systems
- + Pumps and motors
- + LED streetlights and traffic signals
- + Automated energy management systems/controls
- + Building insulation
- + Renewable energy generation and combined heat and power projects
- + Heating and air conditioning modifications
- + Waste water treatment equipment

Loans for energy projects must be repaid from energy cost savings within 15 years, including principal and interest (approximately 13 years simple payback for the one percent interest rate funding and approximately 11 years simple payback for the three percent interest rate funding). Simple payback is calculated by dividing the dollar amount of the loan by the anticipated annual energy cost savings.

Only project-related costs, with invoices dated after loans are officially awarded by the Energy Commission at a Business Meeting, are eligible to be reimbursed from loan funds. The final ten percent of the funds will be retained until the project is completed. Interest is charged on the unpaid principal computed from the date of each disbursement. The repayment schedule is up to 15 years and will be based on the annual projected energy cost savings from the aggregated projects.

School Facility Program – Modernization Grants

www.opsc.dgs.ca.gov/Programs/SFPrograms/Mod.htm

The School Facility Program (SFP) provides funding assistance to school districts for the modernization of school facilities. The assistance is in the form of grants approved by the State Allocation Board (SAB), and requires a 40 percent local contribution. A district is eligible for grants when students are housed in permanent buildings 25 years old or older and re-locatable classrooms 20 years old or older and the buildings have not been previously modernized with State funds. The modernization grant can be used to fund a large variety of work at an eligible school site including but not limited to air conditioning, insulation, roof replacement, as well as the purchase of new furniture and equipment.

Infrastructure State Revolving Fund Program

www.ibank.ca.gov/infrastructure_loans.htm

The Infrastructure State Revolving Fund Program provides direct low-cost loans for local governmental public infrastructure projects, including:

- + City Streets
- + City Highways
- + Environmental Mitigation Measures
- + Parks and Recreational Facilities
- + Public Transit
- + Solid Waste Collection and Disposal

Rio Vista can consider applying for these low-interest loans to implement a wide range of CAP measures. Though some eligible projects would be considered public projects, other eligible projects are pertinent to specific measures in this CAP. In particular, the transportation- and waste-related measures could seek financing through this program. Loans are available in amounts ranging from \$250,000 to \$10 million per applicant for Tier 1 loans, and \$250,000 to \$2.5 million per applicant for Tier 2 loans (the tier system is based on evaluation of project impact; the greater the project impact, the higher the cap on available funds).

CPUC Self Generation Incentive Program

www.cpuc.ca.gov/PUC/energy/DistGen/sgip/

The CPUC's Self-Generation Incentive Program (SGIP) provides incentives to support existing, new, and emerging distributed energy resources. The SGIP provides rebates for qualifying distributed energy systems installed on the customer's side of the utility meter. Qualifying technologies include wind turbines, fuel cells, and corresponding energy storage systems.

Energy-Related Bond Financing

Qualified Energy Conservation Bonds (QECBs)

A Qualified Energy Conservation Bond (QECB) is a tax credit bond; issuers repay principal on a regular schedule, but generally do not pay interest. Instead, the holder of a QECB receives a federal tax credit in lieu of interest, which may be applied against the bond holder's regular and alternative minimum tax liability. The tax credit amount is

treated as taxable interest income to the holder of the bonds. For example, if the tax credit amount is \$100 and the holder is in the 35 percent tax bracket, the credit provides a \$65 benefit to the holder. Under the current program, QECBs must be issued by the end 2010, though this program is likely to be renewed for the foreseeable future.

The proceeds of the QECBs can be used for one or more of the following “qualified conservation purposes”:

- + Type I: Capital expenditures incurred for purposes of (i) reducing energy consumption in publicly-owned buildings by at least 20 percent, (ii) implementing green community programs (including the use of loans, grants, or other repayment mechanisms to implement such programs), (iii) rural development involving the production of electricity from renewable energy resources, or (iv) any qualified facility eligible for the production tax credit under Section 45 of the IRS Code.
- + Type II: Expenditures with respect to research facilities and research grants to support research in: (i) development of cellulosic ethanol or other non-fossil fuels; (ii) technologies for the capture and sequestration of carbon dioxide produced through the use of fossil fuels, (iii) increasing the efficiency of existing technologies for producing non-fossil fuels; (iv) automobile battery technologies and other technologies to reduce fossil fuel consumption in transportation, or (v) technologies to reduce energy use in buildings
- + Type III: Mass commuting and related facilities that reduce the consumption of energy, including expenditures to reduce pollution from vehicles use
- + Type IV: Demonstration projects designed to promote the commercialization of (i) green building technology; (ii) conversion of agricultural waste for use in the production of fuel or otherwise; (iii) advanced battery manufacturing technologies; (iv) technologies to reduce peak use of electricity; or (v) technologies for the capture and sequestration of carbon dioxide emitted from combining fossil fuels to produce electricity
- + Type V: Public education campaigns to promote energy efficiency

Though some eligible projects would be considered public projects, other eligible projects are pertinent to specific measures in this CAP. In particular, the following eligible project types could have broad applicability in funding the measures in this CAP: Type II-(ii) green community programs, Type III mass commuting facilities, and Type V public education campaigns.

Other Climate-Related Programs

CAL FIRE Climate Change Program

Under the authority of the Urban Forestry Act, the Urban Forestry Program offers grants of over \$1 million dollars per year to plant trees, and over \$2.5 million for related forestry projects in urban communities throughout California.

CAL FIRE has identified five forestry strategies for reducing or mitigating GHG emissions, which are:

- + Reforestation to promote carbon sequestration
- + Forestland conservation to avoid forest loss to development

- + Fuel reduction to reduce wildfire emissions and utilization of those materials for renewable energy
- + Urban forestry to reduce energy demand through shading, increase sequestration, and contribute biomass for energy generation
- + Improved management to increase carbon sequestration benefits and protect forest health

These strategies were recognized by the Governor’s Climate Action Team reports in 2006 and 2007, and by the Air Resources Board in its Climate Change Scoping Plan.

Climate Corps Bay Area

<http://www.climatecorps-bayarea.org/>

CCBA receives funding to place AmeriCorps members with local governments, public agencies and other nonprofits to work on energy and climate projects. Each CCBA member spends 11 months (1,700 hours of service) working on emissions reductions projects for their site organization. During this term of service, members will directly help communities to reduce their GHG emissions. Members cannot work directly on policy development or policy advocacy efforts. The goal for this program is for participating members to provide direct service to communities by working on projects that:

- + Realize measureable energy saving, clean energy and GHG reduction opportunities
- + Engage community members in activities that yield measurable energy and GHG benefits
- + Increase civic participation in community energy and climate efforts

Partnerships with Private Companies and Other Organizations

Numerous private companies provide renewable energy or green infrastructure. The success of the CAP depends in part on collaboration between these businesses and the city and public. For example, numerous companies are involved in developing electric plug-in auto charging station infrastructure throughout the Bay Area. PG&E also administers numerous energy efficiency and water conservation programs that the city can leverage and help advertise to residents. Solar companies will also be an important asset to the CAP, as the advent of the Power Purchase Agreement (PPA) enables businesses, residents, and the city to install solar panels and access solar power at no cost. Partnering with new and existing businesses, will enable the city to save money and provide the community with the most up-to-date green infrastructure.

Power Purchase Agreements

Renewable energy has become increasingly more accessible and cost-effective due to Power Purchase Agreements (PPAs). In a PPA, a private company or third party installs a renewable energy technology, often solar panels, at no cost to the consumer and maintains ownership of the installed panels, selling customers the power produced on a per kilowatt-hour basis at a contractually-established rate. The rate is lower than what customers pay their utility today, and increases at a fixed percentage (usually 2.5 to 4.0 percent) annually which is typically lower than the rate escalation by the utilities. In

addition to installing the panels, the third party monitors and maintains the systems to ensure functionality. The contract period for a PPA is typically 15 years, at which point the third party will either uninstall the panels or sign a new agreement with the building owner. These agreements are ideal for demonstration projects implemented by the city and residents or businesses with interests in reducing the carbon emissions associated with energy consumption in their homes and businesses. This form of financing systems such as solar PV systems is becoming increasingly popular in the Bay Area, with a number of companies specializing in this form of financial transaction.

Energy Savings Performance Contracting

The basic concept of the energy savings performance contract (ESPC) is that an Energy Services Company (ESCO) guarantees the amount of energy saved, and further guarantees that the value of that energy would be sufficient to make the debt service payments as long as the price of energy does not fall below a stipulated floor price. The key benefits of the guaranteed savings include:

- + The amount of energy saved is guaranteed
- + The value of energy saved is guaranteed to meet debt service obligations down to a stipulated floor price
- + The city carries the credit risk
- + A smaller piece of the investment package goes to “buy” money
- + Tax-exempt institutions can use their legal status for much lower interest rates
- + ESCO carries only the performance risk

Typically, an ESPC project would have a simple payback of 10 years or less to allow for the cost of money and other fees to be included in the overall project payback. Lending institutions look for less than 15 years including all fees.

Typical projects include:

- + Energy management systems
- + Interior and exterior lighting
- + Boiler replacement/repair of steam systems
- + High-efficiency HVAC systems
- + LED traffic systems
- + Wastewater treatment plant pumps and motors

There are numerous ESCOs with reliable track records throughout the state. As evidenced by the above project types, the ESPC financing option would be most applicable to municipal operations-related measures in this CAP. If the city were interested in demonstration projects for particular energy savings technologies, this financing mechanism would apply.

Energy Efficiency Mortgages

www.hud.gov/offices/hsg/sfh/eem/energy-r.cfm

Energy Efficiency Mortgages can provide owners additional financing (whether at time-of-sale or upon refinancing) for energy efficiency improvements at discounted interest rates. Energy efficiency upgrades could be chosen that would allow owners to realize a

net monthly savings. The goal is to provide capital for energy efficiency upgrades at a discounted interest rate. The Federal Housing Administration (FHA) offers an Energy Efficient Mortgage Loan program. This program helps current or potential homeowners significantly lower their monthly utility bills by enabling them to incorporate the cost of adding energy-efficient improvements into their new home or existing housing. This FHA program eliminates the need for homeowners who are interested in making their home more energy efficient to take out an additional mortgage to cover the cost of the improvements. The improvements can be included in a borrower's mortgage only if the total cost is less than the total dollar value of the energy that will be saved during its useful life. The program is available as part of a FHA-insured home purchase or by refinancing a current mortgage loan.

ENERGY STAR, a program under the DOE, offers another energy efficient mortgage option, though it is in its pilot phase and not currently available in California. This program is designed to encourage comprehensive energy efficiency improvements to new and existing homes by increasing the affordability and availability of energy efficiency mortgages for homeowners and homebuyers. These mortgages include the cost of energy efficiency investments in the loans themselves so that borrowers can pay for those investments over the life of their loans, as well as deduct the interest from their federal and State income taxes. One of the key benefits of an ENERGY STAR mortgage is that a borrower can finance energy-saving improvements to their home without paying more than he/she would for a typical mortgage. Following the completion of the pilot phase, this program will be extended to California.

Partnerships with Other Jurisdictions and Organizations

As Rio Vista is a relatively small portion of Solano County in terms of population, partnering with neighboring jurisdictions is another key implementation strategy supporting the CAP. Various jurisdictions within Solano County could serve as potential partners in implementing the CAP strategies. The city should seek to partner with appropriate local governments, as identified in the CAP measure implementation sections, other potential partners including:

- + Solano Transportation Agency
- + Metropolitan Transportation Commission (MTC)
- + Association of Bay Area Governments (ABAG)
- + Pacific Gas & Electric (PG&E)
- + YSAQMD
- + Solano Economic Development Corporation
- + Solano Center for Business Innovation
- + Regional water districts
- + California ReLeaf
- + Sustainable Agriculture Education (SAGE)
- + United States Green Building Council (USGBC) – Northern California Chapter

Infrastructure Financing Districts

Local governments can finance a variety of infrastructure, public facilities, and related improvements through Infrastructure Finance Districts (IFDs). In 2014, AB 471 (Atkins) expanded the authority of cities and counties to establish and fund IFDs. An IFD may finance a project or portion of a project that is located in, or overlaps with, a redevelopment project area or former redevelopment project area and use tax increment financing (to the extent available after meeting former redevelopment agency debt and other financial obligations). As part of budget proposal, Governor Brown is proposing legislation to expand the use of IFDs, lower the voter threshold to create the districts from 2/3 to 55%, and allow.

Other Self-Financing Strategies


CAP measures include a range of incentives and regulations to change the community's behavior. It is important that the fees established in the CAP be self-financing. The money raised through the fees would then be used to implement the CAP measures determined to provide the best mitigation results. Rio Vista will actively explore opportunities to establish programs that are self-financing and thus sustainable over the long term.

Prospective Funding: Cap and Trade Revenue

Governor Brown has proposed several hundred million dollars in funding for transportation programs that would reduce GHG emissions. These are summarized below. A copy of the Legislative Analyst Office's report with more details is at:

<http://lao.ca.gov/reports/2014/budget/overview/budget-overview-2014.pdf>.

- + **Sustainable Communities \$100 million** – The Strategic Growth Council will administer this program in coordination with various departments to implement Sustainable Communities Strategies that improve transit ridership, increase active transportation, provide affordable housing near transit, as well as preserves agricultural lands and supports local planning efforts that promote infill development. A priority will be given to projects in disadvantaged communities.
- + **Low Carbon Transportation \$200 million** – The California Air Resources Board will use these funds to accelerate the transition to low carbon freight and passenger transportation, with a priority for disadvantaged communities. These funds will be used to augment the Air Board's existing programs that provide rebates for zero-emission cars and vouchers for hybrid and zero-emission trucks and buses.
- + **Transportation Management Programs** – \$100 million for traffic management mobility projects, \$9 million for active transportation projects, and \$5 million for environmental mitigation.
- + **Proposition 1B Bond Funds** – \$793 million to support local transit operators.



City of Suisun City Climate Action Plan

Public Review Draft
April 2014



City of Suisun City **Climate Action Plan**

Public Review Draft
April 2014

Prepared for:

City of Suisun City

Consultant to the City:



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CHAPTER I

INTRODUCTION: PLANNING FOR CLIMATE CHANGE



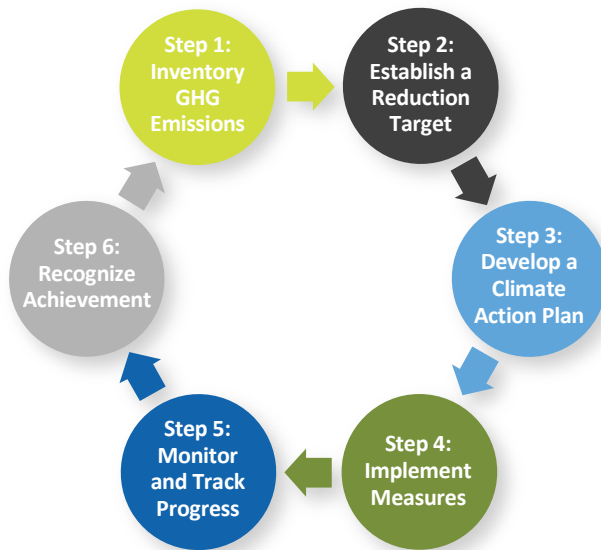
The State of California considers increasing greenhouse gas (GHG) emissions and resulting climate change impacts a major global challenge for the 21st century. According to most climatologists, the planet is starting to experience shifts in climate patterns and increased frequency of extreme weather events at both the global and local levels. At a statewide level, these impacts include reduced snow pack in the Sierra Nevada affecting California water supplies; rising sea levels threatening cities along the coast, San Francisco Bay, and Sacramento River; decreasing air quality affecting public health, particularly in the Central Valley; and, rising temperatures impacting the state's agricultural industry, including Solano County farmers and agricultural businesses.

This plan seeks to address these impacts by increasing local energy independence, improving building energy and water efficiency, supporting alternative transportation options, improving solid waste management, and establishing a regional framework for collaboration. This framework will build from the working relationships established during plan preparation to realize efficiencies in measure implementation among the various jurisdictions within Solano County.

What is a CAP?

A CAP (Climate Action Plan) is a tool that many cities in California are using to quantify their share of statewide GHG emissions and establish action steps toward achieving a local emissions reduction target. A CAP provides a set of strategies intended to guide community efforts to reduce GHG emissions, often through a combination of statewide and local actions. Figure 1.1 shows the typical steps included in the CAP development process.

Figure 1.1 – Steps in the CAP Development Process



A CAP contains community-specific GHG emission inventories and forecasts to establish a starting point and probable future emissions levels if no action is taken (Step 1). A reduction target is then defined to provide an aspirational goal for improvement (Step 2). Emission reduction measures and implementation programs are written to help the city meet its goal by achieving the reduction target (Step 3). Upon adoption of the CAP, the jurisdiction takes action to implement the reduction measures (Step 4), monitor their progress towards achievement of the reduction target (Step 5), then evaluate effectiveness, celebrate their successes, and use the monitoring results to make adjustments to CAP measures to improve performance (Step 6). This CAP represents the city’s progress on Steps 1-3, which are described in more detail below.

Purpose

The climate action planning process seeks to identify measures which are informed by the goals, values, and priorities of the community, while also contributing to the state’s climate protection efforts and complying with any applicable Air Quality District standards for GHG emissions. In addition, the CAP measures are intended to increase community resilience and efficiency of human / economic activities that consume resources which, in turn, lead to greenhouse gas emission (e.g., increasing local energy

independence, reducing transportation-related emissions, improving building energy and water efficiency, and extending the life of area landfills). The CAP can also support regional collaborations among local jurisdictions on climate change issues. There are also California Environmental Quality Act (CEQA) review streamlining benefits for development projects occurring within a jurisdiction that has an adopted CAP.

Context

Many local governments in California are using CAPs to quantify their share of statewide GHG emissions and establish action steps toward achieving a local emissions reduction target. Jurisdictions within Solano County already have a history of taking a leadership role in this area. The cities of Benicia and Vallejo and the County of Solano have already adopted climate action plans. In addition, the City of Vacaville released its Public Review Draft CAP in late 2013 for public review and comment. The City of Suisun City's (city) efforts are complimentary to those already taken by its neighbors and are part of a regional effort described below.

CAPs typically address emissions targets through reduced dependency on fossil fuels and nonrenewable energy sources, increased energy and water efficiency, land use and technological changes that reduce transportation emissions, and improved waste management strategies. CAPs also provide a way to connect climate change mitigation (GHG reduction) to climate adaptation, community resilience, and broader community goals.

In Suisun City, GHG emissions come from energy used in buildings, gasoline burned in motor vehicles and power equipment, water and wastewater treatment and conveyance, and solid waste disposal. Suisun City's CAP examines the communitywide activities that result in GHG emissions and establishes strategies to help reduce those emissions in existing and future development through both voluntary and mandatory actions. The CAP also considers the local impact of federal and statewide actions to reduce GHG emissions.

In addition to reducing greenhouse gases, many of the strategies included in this plan will also help make Suisun City a more attractive place to live – lowering energy and water bills through conservation, improving circulation through bike and pedestrian facility enhancements, improving air quality, and reducing waste generation to extend the lifetime of local landfills.

Process

This CAP was prepared as part of a Solano County regional-effort, involving the cities of Dixon, Fairfield, Rio Vista, and Suisun City (the participating cities). The intent of preparing this CAP through a regional collaborative process was to establish a common list of reduction measures so that no one jurisdiction would become economically (dis)advantaged through its CAP actions, and to find collaborative opportunities for plan implementation. To that end, the reduction measures contained within Chapter 3 were developed through a collaborative and simultaneous process among the participating cities. The previously adopted CAPs within the county were also reviewed during the measure development process to ensure countywide consistency to the extent possible.

FUNDING

PG&E GREEN COMMUNITIES PROGRAM

The four participating cities, along with the City of Vacaville, received funding through the Pacific Gas & Electric Company's (PG&E's) Green Communities Program to prepare energy efficiency climate action plans. These plans included many components of a full CAP, including evaluation of baseline emissions, future energy use forecasts, target setting, and the development of energy efficiency measures. These draft energy plans were presented to the Planning Commissions of each participating jurisdiction for their review and comment. The resulting information prepared during that effort has been incorporated throughout this full CAP.

STRATEGIC GROWTH COUNCIL PLANNING GRANT

The participating cities also received funding from the Strategic Growth Council (SGC) to develop the remaining non energy-related components of their CAP. This included preparing emissions forecasts for the transportation, solid waste, wastewater, and water sectors, as well as development of reduction measures targeting these sectors. This work was combined with the PG&E-funded draft energy plans to create a comprehensive CAP for each city.

Though similar in many ways, the participating cities each developed a customized CAP, relevant to their community's specific context.

PUBLIC STAKEHOLDER ENGAGEMENT

The project team kept the public, city staff, and elected officials informed and involved during the CAP development process. Stakeholder input was solicited at project milestones through a Regional Technical Advisory Committee (RTAC), at Solano City County Coordinating Council (4C's) meetings, community workshops, and Planning Commission presentations. See Table 1.1 for a list of the public stakeholder engagement activities.

RTAC

The Regional Technical Advisory Committee was formed during the project kick-off phase in June 2012 under the direction of the Solano Transportation Authority. City staff, local business community representatives, and regional agency staff were invited to participate in order to:

- + help gauge project feasibility and success
- + provide feedback on interim documents
- + help make project meaningful and beneficial for all communities
- + review, comment on, and discuss measures and implementation framework
- + support public outreach and future implementation efforts

The RTAC met nine times between June 2012 and October 2013. The first five meetings were committed to development of the PG&E-funded Energy Efficiency CAPs (EECAPs). The last four meetings focused on the SGC-funded portions of the CAPs, as well as

identification of regional implementation opportunities. Table 1.2 lists RTAC members who participated at various points of the CAP development process.

Table 1.1 Public Stakeholder Engagement Overview				
Meeting	Date	Location	Topic/Task	Stakeholders
STA/PGE EECAP Project Kickoff Workshop	June 13-14, 2012	STA Offices	Project kick off and policy gap analysis	City planners, Planning Commissions, City Councils
Community Workshop #1	July 12, 2012	Administration Center	Project kick-off; energy efficiency in participating cities	All
RTAC Meeting #1	July 24, 2012	STA Offices	RTAC kick-off; discuss policy gap analysis	RTAC members
4C's Meeting #1	August 9, 2012	Solano County Water Agency	Overview of project process	4C's Mayors and Supervisors
RTAC Meeting #2	August 28, 2012	STA Offices	Draft actions and measures (Energy)	RTAC members
RTAC Meeting #3	September 25, 2012	STA Offices	Administrative Draft Energy Efficiency CAPs	RTAC members
RTAC Meeting #4	October 23, 2012	STA Offices	Public Review Draft comments	RTAC members
RTAC Meeting #5	November 27, 2012	STA Offices	Planning Commission presentation preparation	RTAC members
Planning Commission Presentations – Energy Efficiency CAPs	November/ December 2012	Dixon, Fairfield, Rio Vista, and Suisun City	Present Draft Energy Efficiency CAPs; discuss next steps	City Planners, Planning Commissions, City Councils, Business Alliance
RTAC Meeting #6	April 16, 2013	STA Offices	Project kick-off for SGC-funded portion of CAPs; overview and schedule	RTAC members
4C's Meeting #2	May 9, 2013	Solano County Water Agency	Target setting and reduction gaps to be addressed by non-energy measures	4C's Mayors and Supervisors
RTAC Meeting #7	May 30, 2013	STA Offices	Preliminary measures list (non-energy), full emissions forecasts, targets and remaining reduction gaps	RTAC members
RTAC Meeting #8	June 18, 2013	STA Offices	Community workshop overview; regional implementation opportunities	RTAC members
Community Workshop #2	June 27, 2013	Solano County Events Center	Presentation of preliminary measures; participation activity to rank CAP measure options; community questionnaire	All
RTAC Meeting #9	October 22, 2013	STA Offices	Review draft measures and actions; discuss gap-filling measures to achieve targets	RTAC members
4C's Meeting #3	November 14, 2013	Solano County Water Agency	Progress report	4C's Mayors and Supervisors
4C's Meeting #4	March 13, 2014	Solano County Water Agency	Presentation of Public Review Draft CAPs	4C's Mayors and Supervisors

**Table 1.2
RTAC Members**

Name	Organization
Michael Neward	Bay Area Air Quality Management District
Alex Porteshawver	City of Benicia
Dave Dowswell	City of Dixon
Erin Beavers / David Feinstein / Brian Miller	City of Fairfield
Dave Melilli / John Degele	City of Rio Vista
John Kearns	City of Suisun City
Tyra Hays	City of Vacaville
Michelle Hightower	City of Vallejo
Dave Hunt	Gymboree
Chuck Rieger	Solano Center for Business Innovation
Matt Walsh	Solano County
Sandy Person	Solano Economic Development Corporation
Chris Lee / Any Floreno / David Okita	Solano County Water Agency
Mona Babauta	Soltrans Ride
Mathew Ehrhardt	Yolo Solano Area Air Quality Management District

4Cs

The Solano County Board of Supervisors and the mayors of the seven Solano County cities comprise the Solano City County Coordinating Council (CCCC) or “4Cs”, whose purpose is to improve countywide communication and coordination on issues of regional importance. The project team attended four meetings with the 4Cs to give CAP status updates and receive input to define the project’s regional approach.

PUBLIC WORKSHOPS

Two public workshops were held to gather community input on the initial list of CAP reduction measures. The workshops were open to all county residents and broadly advertised in local media, on STA’s website, and through email announcements distributed through local email lists from participating city staff. Flyers were also posted at the Solano County Administrative Center, where the workshops were held, and in downtown Fairfield. The first workshop in July 2012 focused on the energy efficiency plans, while the second in June 2013 included discussion of all emissions sectors. At both workshops, the public was encouraged to fill out a survey and talk to city staff representatives about the CAP specifics of each city. Even though some community members questioned the need to reduce GHGs, overall feedback for the effort to increase efficiencies was positive and the survey responses showed that many community members are already actively supporting resource conservation by composting and making efforts to conserve energy. PG&E staff attended the workshops to provide information on available energy efficiency programs and resources. The project team also presented an overview of the CAP planning process and facilitated a question and answer session. Community members were given another chance to comment at the Planning Commission and City Council meetings where the Draft Energy Efficiency CAPs (in 2012) and the Public Review Draft CAPs (in 2014) were presented.

Scope and Content of the Climate Action Plan

The CAP consists of four chapters: 1) Introduction: Planning for Climate Change; 2) Baseline Emissions Inventory, Forecasts, and Targets; 3) Emissions Reduction Measures; and 4) Benchmarks and Implementation. Appendices A through E provide additional detail on topics covered within the plan. The contents of each chapter and appendix are briefly described below.

- + **Chapter 1, Introduction: Planning for Climate Change**, describes the city's rationale for preparing a CAP, as well as the goals of the CAP to comply with local Air Quality Management District guidelines, as applicable. This chapter provides an overview of the topics covered in the CAP, presents conventional climate change science findings, and describes statewide actions to address climate change. This chapter also introduces the CAP's relationship to General Plan Environmental Impact Reports (EIRs), and its ability to enable a CEQA tool known as "tiering" to allow consistent future discretionary development projects to skip certain steps in the traditional CEQA process.
- + **Chapter 2, Baseline Emissions Inventory, Forecasts + Targets**, outlines key steps taken to develop the CAP, including preparing the 2005 baseline GHG inventory, forecasting future emissions for 2020 and 2035, and setting a near-term communitywide GHG reduction target for 2020 and a long-term target for 2035. This chapter also describes the emissions gap between the reduction targets and estimated statewide reductions.
- + **Chapter 3, Emissions Reduction Measures**, presents local measures developed for the five main reduction strategy areas: energy, transportation and land use, solid waste, water, and green infrastructure. This chapter provides a description of the reduction measure development process. Each local measure also includes a description of existing related programs and accomplishments, measure implementation actions, performance metrics against which to measure success, and estimated GHG reductions in 2020 and 2035.
- + **Chapter 4, Benchmarks and Implementation**, describes the process to monitor progress towards achieving the city's GHG reduction targets. This chapter identifies monitoring procedures, plan update processes, and other steps to ensure successful implementation.
- + **Appendix A – Emissions Inventory Methodology** provides a technical description of the methodology used to prepare for the 2005 emission inventory and 2020 and 2035 emissions forecasts.
- + **Appendix B – Target Setting Rationale** provides background information describing how the 2020 and 2035 reduction targets were selected.
- + **Appendix C – BAAQMD Qualification Standards** describes how the CAP conforms to the Bay Area Air Quality Management District (BAAQMD) guidelines for qualifying greenhouse gas reduction plans.
- + **Appendix D – Emissions Reduction Quantification Methodology** provides assumptions used to determine the GHG emission reductions associated with statewide and local actions.

- + **Appendix E – Economic Analysis** presents documentation to support the measure implementation cost ranges included in Chapter 3.

Climate Change Science

According to the US Environmental Protection Agency, global warming refers to the recent and ongoing rise in global average temperature near Earth’s surface, and is caused primarily by increasing concentrations of greenhouse gases in the atmosphere. Global warming is causing climate patterns to change. However, global warming itself represents only one aspect of climate change.

Climate change refers to any significant change in the measure of climate lasting for an extended period of time, including major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer.ⁱ

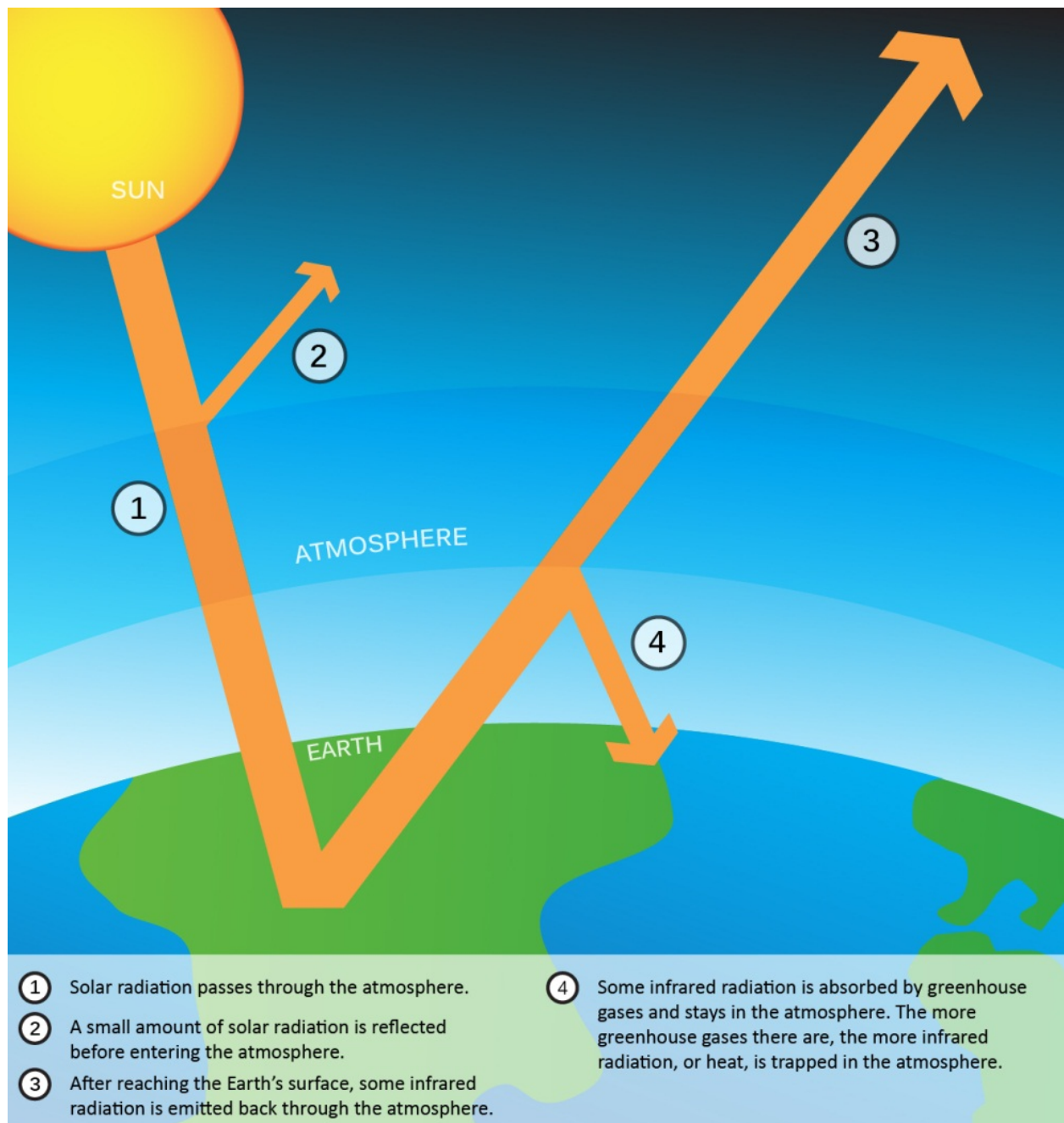
Over the past century, human activities have released large amounts of carbon dioxide (CO₂) and other greenhouse gases into the atmosphere. Greenhouse gases act like a blanket around Earth, trapping energy in the atmosphere and causing it to warm. This phenomenon is called the greenhouse effect and is natural and necessary to support life on Earth. However, the buildup of greenhouse gases can change Earth's climate and result in dangerous effects to human health and welfare and to ecosystems.ⁱⁱ Figure 1.2 provides a simple illustration of the greenhouse effect.

In the United States, 83.6% of GHG emissions are from CO₂, with 94.4% of CO₂ emissions coming from the burning of fossil fuels.ⁱⁱⁱ Trend projections indicate that atmospheric concentrations of GHG emissions will continue to increase throughout this century. If these projections become reality, climate change will threaten our economic well-being, public health, and environment.

California has an advantage in its scientific understanding of climate change and its local effects. A solid body of vital data is available to assist state and local leaders to better understand how climate change is affecting us now, what is in store ahead, and what we can do about it. State-sponsored research has played a major role in recent advances in our understanding of the potential impacts of climate change on California. A first assessment, published in 2006, made clear that the level of impact is a function of global greenhouse gas emissions and that lower emissions can significantly reduce those impacts.^{iv} The third and most recent publication, *The 2012 Vulnerability and Adaptation Study*, explores local and statewide vulnerabilities to climate change, highlighting opportunities for taking concrete actions to reduce climate-change impacts.^v

The California legislature passed legislation (addressed below) based upon the findings of the most comprehensive, advanced, and thoroughly reviewed documents on the science of climate change. The development of CAPs in California, including those in Solano County, is based upon the actions of the California legislature and its reliance on these findings. For further information on Climate Science, please visit the California Climate Change Portal at <http://www.climatechange.ca.gov/>.

Figure 1.2 – Greenhouse Effect



BENEFITS OF ADDRESSING GHG EMISSIONS

Planning efforts intended to reduce GHG emissions through resource efficiency and conservation measures often have multiple co-benefits as well that will improve the local quality of life. While some co-benefits are qualitative, others are quantifiable improvements over current conditions.

This plan references a list of co-benefits to illustrate the overlapping benefits of various CAP measures, though the list used is in no way exhaustive. Overall, these co-benefits:

- + Strengthen local economic development (e.g., CEQA streamlining/tiering, transparent development requirements)
- + Demonstrate regional sustainability leadership
- + Improve neighborhood experiences
- + Support climate change adaptation strategies and community resilience

The following co-benefits are identified in Chapter 3 next to the applicable local reduction measures:

- + Improves air quality
- + Reduced energy use
- + Promotes regional smart growth
- + Reduces traffic congestion
- + Reduces water use; extends community water supply
- + Improves water quality; reduces stormwater run-off
- + Improves local energy independence
- + Increases natural habitat
- + Reduces heat island effect
- + Improves public health
- + Creates local jobs
- + Reduces waste; extends landfill lifespan
- + Provides long-term savings to residents, businesses, and local governments
- + Raises community awareness

California Climate Change Actions

Suisun City's strategy for climate protection, as one of eight local plans in the Solano County regional climate action planning effort, must be set within the context of the Bay Area and the State, where much of the momentum for local action in the United States originates.

California has long been a sustainability leader, as illustrated by Governor Schwarzenegger signing Executive Order (EO) S-3-05 in 2005. EO S-3-05 recognizes California's vulnerability to a reduced snowpack, exacerbation of air quality problems, and potential sea-level rise due to a changing climate. To address these concerns, the governor established targets to reduce statewide GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050.

In 2006, California became the first state in the country to adopt a statewide GHG reduction target, through the adoption of Assembly Bill 32 (AB 32). This law codifies the EO S-3-05 requirement to reduce statewide emissions to 1990 levels by 2020. AB 32 resulted in the California Air Resources Board (ARB) adoption of a *Climate Change Scoping Plan* (Scoping Plan) in 2008. The Scoping Plan outlines the state's plan to achieve emission reductions through a mix of direct regulations; alternative compliance mechanisms; and different types of incentives, voluntary actions, market based mechanisms, and funding. The Scoping Plan addresses similar areas to those contained in this CAP, including building energy efficiency, transportation, waste reduction, water conservation, and green infrastructure.

AB 32 engendered several companion laws that can assist Suisun City in reducing communitywide GHG emissions to achieve its local target. These legislative actions and regulations are referred to as statewide actions throughout this plan, and represent a significant source of estimated GHG reductions. The CAP estimated GHG emission reductions associated with:

- + Renewable Portfolio Standard (RPS),
- + AB 1109 Lighting Efficiency
- + California 2013 Building Energy Efficiency Standards,
- + AB 1493 Pavley I and II
- + EO-S-1-07 Low Carbon Fuel Standard, and
- + Vehicle Efficiency Regulations.

As the regulatory framework surrounding AB 32 grows, it may be possible to evaluate a wider range of statewide reductions.

RENEWABLE PORTFOLIO STANDARD

Senate Bill (SB) 1078, SB 107, EO-S-14-08, and SB X1-2 have established increasingly stringent Renewable Portfolio Standard (RPS) requirements for California utilities. RPS-eligible energy sources include wind, solar, geothermal, biomass, and small-scale hydro.

- + **SB 1078** required investor-owned utilities to provide at least 20% of their electricity from renewable resources by 2020.
- + **SB 107** accelerated the SB 1078 timeframe to take effect in 2010.
- + **EO-S-14-08** increased the RPS further to 33% by 2020. PG&E, Suisun City's electricity provider, delivered 12.1% of its electricity from RPS-eligible renewable sources in 2005 and 19% in 2011.
- + **SB X1-2** codified the 33% RPS by 2020 requirement established by EO-S-14-08.

AB 1109 – LIGHTING EFFICIENCY

AB 1109 was signed into law in 2007. The California Lighting Efficiency and Toxics Reduction Act requires the California Energy Commission to adopt energy efficiency standards for all general purpose lights, reducing lighting energy usage in indoor residences and state facilities by no less than 50%, by 2018, as well as require a 25% reduction in commercial facilities by that same date. To achieve these efficiency levels, the California Energy Commission applied its existing appliance efficiency standards to include lighting products, as well as required minimum lumen/watt standards for different categories of lighting products. In addition, the bill prohibits the manufacturing for sale or the sale of certain general purpose lights that contain hazardous substances.

2013 BUILDING ENERGY EFFICIENCY STANDARDS

California's Building Standards Code (California Code of Regulations Title 24) dictates how new buildings and major remodels are constructed in California. The Building Energy Efficiency Standards (Title 24, Part 6), are a subset of the state building code, which detail energy efficiency standards for residential and non-residential development. The standards are updated on an approximately three-year cycle. The state has further increased building energy conservation requirements through adoption of the 2013 standards, which go into effect July, 1 2014. It is estimated that these revisions to the current 2008 Building Energy Efficiency Standards will result in energy consumption reductions of 25% over the current standards.

The California Green Building Standards Code (California Code of Regulations Title 24, Part 11) includes additional requirements for new construction and renovation projects that may also result in emissions reductions. This plan does not include these reductions as a separate measure. However, the impact of these requirements may be accounted for in other statewide or local reduction measures (e.g., construction and demolition waste diversion requirements).

NET ZERO ENERGY NEW BUILDINGS

In the *2007 Integrated Energy Policy Report*, the CEC adopted a goal to achieve net zero energy buildings in new residential construction by 2020 and non-residential construction by 2030. A net zero energy building consumes only as much energy on an annual basis as can be generated with an on-site renewable energy system (e.g., solar, wind, geothermal). While the pathway to realize this goal has not yet been defined, this plan considers the future impact of this measure as part of an illustration to show what it will take to achieve the city's longer-term emissions reduction target (see Chapter 3 for further description).

AB 1493 – PAVLEY I AND II

AB 1493, California's mobile-source GHG emissions regulations for passenger vehicles, or California Clean Car Standards, was signed into law in 2002. AB 1493 requires ARB to develop and adopt regulations that reduce GHG emissions from passenger vehicles, light-duty trucks, and other non-commercial vehicles for personal transportation. In 2004, ARB approved amendments to the California Code of Regulations adding GHG emissions standards to California's existing standards for motor vehicle emissions.

EO-S-1-07 – THE LOW CARBON FUEL STANDARD

EO-S-01-07 reduces the carbon intensity of California's transportation fuels by at least 10% by 2020. The Low Carbon Fuel Standard (LCFS) is a performance standard with flexible compliance mechanisms that incentivizes the development of a diverse set of clean, low-carbon transportation fuel options to reduce GHG emissions.

VEHICLE EFFICIENCY REGULATIONS

ARB has adopted several regulations to reduce emissions through improved vehicle efficiency that will have local GHG emission reduction benefits in Suisun City. The following two regulations were quantified and included as part of this CAP.

TIRE INFLATION REGULATION

On September 1, 2010, ARB's Tire Pressure Regulation took effect. The purpose of this regulation is to reduce GHG emissions from vehicles operating with under-inflated tires by inflating them to the recommended tire pressure rating. The regulation applies to vehicles with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. Under this regulation, automotive service providers must meet the following requirements:

- + Check and inflate each vehicle's tires to the recommended tire pressure rating, with air or nitrogen, as appropriate, at the time of performing any automotive maintenance or repair service.
- + Indicate on the vehicle service invoice that a tire inflation service was completed and the tire pressure measurements after the service were performed.
- + Perform the tire pressure service using a tire pressure gauge with a total permissible error no greater than + two (2) pounds per square inch (psi).
- + Have access to a tire inflation reference that is current within three years of publication.
- + Keep a copy of the service invoice for a minimum of three years, and make the vehicle service invoice available to the ARB, or its authorized representative upon request.

HEAVY-DUTY VEHICLE GHG EMISSION REDUCTION (AERODYNAMIC EFFICIENCY)

This regulation requires existing trucks/trailers to be retrofitted with the best available technology and/or ARB-approved technology to increase vehicle aerodynamics and fuel efficiency that will result in GHG reductions. This measure has been identified as a Discrete Early Action in the Scoping Plan, which means it must be enforceable beginning in 2010. Technologies that reduce GHG emissions and improve the fuel efficiency of trucks may include devices that reduce aerodynamic drag and rolling resistance. These requirements apply to both California-registered trucks and out-of-state registered trucks that travel to California.

SB 375

The Sustainable Communities and Climate Protection Act of 2008 (SB 375) was adopted to support statewide GHG reduction efforts through coordinated transportation and land use planning. SB 375 seeks to:

- + Use the regional transportation planning process to help achieve AB 32 goals.
- + Use CEQA streamlining as an incentive to encourage transit-oriented residential projects that help achieve AB 32 goals.
- + Coordinate the regional housing needs allocation process with the regional transportation planning process, providing monetary incentives for sustainable development.

Under SB 375, ARB set regional targets for GHG emissions reductions from passenger vehicle use. In 2010, ARB established these targets for 2020 and 2035 for each region covered by one of the State's Metropolitan Planning Organizations (MPO). Each of California's MPOs must prepare a "sustainable communities strategy" (SCS) as an integral part of its regional transportation plan. The SCS contains land use, housing, and transportation strategies that, if implemented, would allow the region to meet its GHG emission reduction targets. The Metropolitan Transportation Commission (MTC) is the MPO for nine Bay Area counties, including Solano County. As such, MTC developed *Plan Bay Area* as its long-range integrated land use and housing strategy, and includes the region's SCS and RTP.

This CAP was developed using household and employment projections from *Plan Bay Area* as well as future travel demand for 2020 and 2035 from MTC's transportation model to provide consistency between the CAP and the SCS. While there are no discrete SB 375 emissions reductions included in the CAP, the transportation emission forecasts were developed using modeled travel data from the SCS, thereby incorporating compliance with SB 375 into the CAP.

Relationship to the General Plan

Whether by local desire, guidance from the State of California, or both, cities and counties are increasingly addressing climate change in their General Plans through the inclusion of policies and programs that have a co-benefit of reducing GHG emissions. The city's policy commitment includes encouraging higher density, mixed-use and infill development in appropriate locations, energy efficiency, and renewable energy development that contribute to GHG reduction strategies contained in the CAP. Since GHG emissions are a cross-cutting issue addressed by many General Plan elements, the CAP as a whole is generally considered an implementation measure for the General Plan. This structure allows the city to update the CAP on an ongoing, as-needed basis to ensure that their climate protection efforts reflect both current legislation and emerging best practices.

In addition, several state agencies have provided guidance and case studies for local governments to address climate change in their General Plans. For example:

- + Since 2008, the California Attorney General's office has provided guidance to local governments on addressing climate change and greenhouse gas reduction through General Plan policies.
- + The California Office of Planning and Research (OPR) is preparing an update to the state's *General Plan Guidelines* that will include guidance for GHG emissions reduction and climate adaptation.
- + The California Natural Resources Agency has released a Climate Adaptation Policy Guide for local governments.
- + The California Department of Housing and Community Development has released a guidance document on General Plan housing element policies and programs addressing climate change with case study examples.
- + The Office of Planning and Research prepared a guidance document for addressing complete streets in General Plans as required by AB 1358.

Relationship to the California Environmental Quality Act

Local governments may prepare a Plan for Reduction of Greenhouse Gases that is consistent with AB 32 goals. By preparing such a plan, the city can streamline CEQA review of subsequent plans and projects consistent with the GHG reduction strategies and target in the plan. To meet the standards of a qualified GHG reduction plan, Suisun City's CAP must achieve the following criteria (which elaborate upon criteria established in State CEQA Guidelines Section 15183.5[b][1]):

- + Complete a baseline emissions inventory and project future emissions
- + Identify a community-wide reduction target
- + Prepare a CAP to identify strategies and measures to meet the reduction target
- + Monitor effectiveness of reduction measures and adapt the plan to changing conditions
- + Adopt the CAP in a public process following environmental review

This approach allows jurisdictions to analyze and mitigate the significant effects of GHGs at a programmatic level, by adopting a plan for the reduction of GHG emissions. Later, as individual projects are proposed, project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review in their cumulative impacts analysis. Project-specific environmental documents prepared for projects consistent with the CAP may rely on the programmatic analysis of GHGs contained in the CAP's corresponding CEQA document. Chapter 4 provides a discussion

of the criteria and process the city will use to determine if a future project is consistent with the CAP.

A project-specific environmental document that relies on this CAP for its cumulative impacts analysis must identify specific CAP measures applicable to the project, and how the project incorporates the measures. If the measures are not otherwise binding and enforceable, they must be incorporated as mitigation measures applicable to the project. If substantial evidence indicates that the GHG emissions of a proposed project may be cumulatively considerable, notwithstanding the project's compliance with specific measures in this CAP, an EIR must be prepared for the project.

QUALIFIED GREENHOUSE GAS REDUCTION STRATEGY

BAAQMD encourages such planning efforts and recognizes that careful early planning by local agencies is invaluable to achieving the state's GHG reduction goals. If a project is consistent with an adopted qualified GHG Reduction Strategy that addresses the project's GHG emissions, it can be presumed that the project will not have significant GHG emissions under CEQA. This CAP meets the definition of a Plan for Reduction of Greenhouse Gases under CEQA. Appendix C provides a discussion regarding how the CAP also meets BAAQMD's Plan Level Guidance (Section 4.3 of the Air District's CEQA Guidelines) for the content of a "Qualified GHG Reduction Strategy" that is consistent with AB 32 goals and *CEQA Guidelines* relating to GHGs. This guidance is important if a city or county desires to use a climate action plan to support tiering of future development projects for purposes of CEQA review of GHG impacts.

Notes

ⁱ US Environmental Protection Agency. Climate Change Basics. Accessed December 4, 2012. Available at: <http://www.epa.gov/climatechange/basics/>.

ⁱⁱ Ibid.

ⁱⁱⁱ US Environmental Protection Agency. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010. April 15, 2012. Accessed December 4, 2012. Available at: <http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html>.

^{iv} California Climate Change Center. Our Changing Climate – Assessing the Risks to California: A Summary Report from the California Climate Change Center. August 2006. Accessed December 4, 2012. Available at: <http://www.energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2006-077>.

^v California Climate Change Center. Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California. July 2012. Accessed December 4, 2012. Available at: <http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf>.

CHAPTER 2

EMISSIONS INVENTORY, FORECASTS + TARGETS

2

This chapter examines Suisun City's current and future communitywide greenhouse gas (GHG) emissions. It outlines the first few steps of the CAP development process, including preparing the 2005 baseline GHG inventory, forecasting future emissions for 2020 and 2035, and setting communitywide GHG reduction targets. These first steps are the foundation upon which locally appropriate reduction measures were later developed. This chapter also presents estimated reductions resulting from statewide actions, and compares their impact to Suisun City's emissions reduction targets. This comparison frames the reductions gap, which is then addressed through local CAP measures described in Chapter 3.

Note: Yellow highlighting in this chapter indicates text, figures, or tables that are subject to revision pending transportation analysis associated with the city's General Plan Update.

Baseline Inventory (2005)

The purpose of a baseline inventory is to provide a snapshot of communitywide GHG emissions in a given year. A baseline inventory allows the city to identify major sources of emissions within the community, and then develop meaningful reduction measures that address the major emissions contributors. The city developed its baseline emissions inventory for the 2005 operational year as part of a countywide climate action planning effort in 2011. Suisun City is located within the Bay Area Air Quality Management District's (BAAQMD) jurisdictional boundary. Therefore, the city's inventory was calculated to be consistent with BAAQMD's GHG Plan Level Quantification Guidance. Some participating cities are located within the Yolo Solano Air Quality Management District's (YSAQMD) jurisdiction. At the time of CAP preparation, YSAQMD had not developed specific GHG inventory guidance, so these cities were also calculated to be consistent with BAAQMD's guidance. This approach allowed all of the jointly-prepared GHG inventories and CAPs to be developed in a consistent manner. See Appendix A for the emissions inventory methodology.

EMISSIONS SECTORS

The baseline inventory organizes emissions into categories, or sectors, based on the emissions sources. Suisun City's inventory includes emissions from the following sectors:

- + Energy (electricity and natural gas)
- + Transportation
- + Solid Waste
- + Off-Road Equipment
- + Potable Water
- + Wastewater

Energy

In general, energy emissions are generated through the combustion of fossil fuels to generate electricity or directly provide power (e.g., natural gas combustion for water heating). The energy sector includes the use of electricity and natural gas in residential, commercial, and industrial land uses within the legal boundaries of the city. Although emissions associated with electricity production are likely to occur in a different jurisdiction, the emissions are considered to be measured at the point of use and not the point of generation. Consumers are thus considered accountable for the generation of those emissions. Electricity-related GHG emissions are considered indirect emissions. Indirect emissions are those that are generated as a result of activities occurring within the jurisdiction, but occur in different geographic areas. For example, a Suisun City resident may consume electricity within the city, but the electricity may be generated in a different region. Direct emissions are those where the consumption activity directly generates the emissions, such as natural gas combustion for heating or cooling.

The Pacific Gas and Electric Company (PG&E) provides electricity and natural gas to all cities within Solano County, and provided electricity and natural gas consumption data to develop the baseline inventory. PG&E provided all electricity and natural gas consumption data in the form of kilowatt-hours per year (kWh/yr) and therms per year

(therms/yr), respectively. Electricity-related GHG emissions were quantified using a PG&E-specific emission factor that accounts for PG&E's 2005 electricity production portfolio (e.g., the mix of coal, oil, wind, solar and other sources of electricity production). Natural gas GHG emissions were also quantified using a PG&E-specific natural gas emissions factor.

Transportation

Transportation emissions come from vehicle trips that begin and/or end within Suisun City's boundaries. Pass through trips (for example, non-local drivers on SR-12) are not included within Suisun City's emissions inventory because the CAP measures would not affect those emissions. This sector includes GHG exhaust emissions from both private vehicles and city-owned vehicles. Unlike most of the other emissions sectors where activity data is available to more precisely calculate actual resource consumption (e.g., electricity used, wastewater generated, solid waste disposed), the transportation sector relies upon travel models to estimate vehicle use within a community. Travel models estimate the total vehicle miles traveled (VMT) within a community, which can then be combined with vehicle fuel emissions factors to estimate transportation-related emissions.

For this CAP, VMT data were acquired from the new Metropolitan Transportation Commission (MTC) activity-based travel model. This model provides VMT data separated by trip origin and destination. The VMT associated with vehicle trips that would originate or terminate within the city were attributed to the city's transportation sector. The MTC model also provides commercial vehicle VMT within a jurisdiction, though calculated differently than the passenger vehicle trips.

Emission factors for the transportation sector were obtained from the California Air Resources Board's (ARB) vehicle emissions model, EMFAC2007. EMFAC2007 is a mobile source emission model for California that provides vehicle emission factors by both county and vehicle class. Solano County-specific emission factors were used in this emissions inventory.

Solid Waste

The solid waste sector includes emissions associated with solid waste disposal. During the solid waste decomposition process, only organic materials release GHGs. Carbon dioxide emissions are generated under aerobic conditions (i.e., in the presence of oxygen), such as when composting. Methane (CH₄) emissions are generated under anaerobic conditions (i.e., in the absence of oxygen), as in many landfill environments. Waste collection and hauling activities also generate GHG exhaust emissions. However, hauling-related emissions are assumed to be included within the MTC commercial vehicle model and represented within the transportation sector.

Solid waste generated within the city is primarily sent to the Potrero Hills landfill. Annual tons of solid waste generated by land uses and waste categorization data were provided by city staff and CalRecycle. The first-order-decay method was used to estimate methane landfill emissions to incorporate the time factor of the solid waste degradation process, which can take decades to occur.

Off Road Equipment

Off-road equipment emissions can come from local construction and mining activities, operation of lawn and garden equipment (e.g., lawn mowers, leaf blowers), and use of light commercial/industrial equipment (e.g., backhoes, forklifts).

Data for construction, mining, light commercial, industrial, and lawn and gardening equipment were obtained from ARB's OFFROAD2007 model, which provides county-level emissions factors for off-road equipment. OFFROAD2007 provides total off-road equipment emissions by county, so applicable indicators specific to Suisun City were used to allocate the city's share of total county-wide emissions (e.g., building permits, households, retail jobs). Similar to the transportation sector, these emissions are modeled and not based on specific activity data.

Potable Water

The potable water sector includes energy emissions associated with water treatment, distribution, and conveyance. Water consumption data was provided by city staff. The California Energy Commission's water-energy intensity studies were used to calculate the amount of electricity required to provide potable water. GHG emissions associated with potable water supply were then calculated using statewide electricity intensity factors.

Wastewater

The wastewater sector includes emissions resulting from wastewater treatment processes and from energy used to power wastewater treatment plants. City staff provided the total amount of wastewater sent to the Fairfield-Suisun Wastewater Treatment Plant from land uses within the city, as well as specific wastewater treatment factors, such as nitrogen content of effluent.

The 2006 International Panel on Climate Change (IPCC) *Guidelines for National Greenhouse Gas Inventories* was used to quantify CH₄ and nitrous oxide (N₂O) emissions resulting from wastewater treatment processes. Generation of both types of emissions depend on the amount of annual throughput (i.e., volume of wastewater), as well as characteristics of the wastewater itself and treatment plant management processes. Energy-related GHG emissions associated with wastewater treatment facility operation were removed from this sector to avoid double counting with the energy sector.

UNITS OF MEASUREMENT

Emissions inventories are commonly expressed in metric tons (or tonnes) of carbon dioxide equivalent per year (MT CO₂e/yr) to provide a standard measurement that incorporates the varying global warming potentials (GWP) of different greenhouse gases. GWP describes how much heat a greenhouse gas can trap in the atmosphere relative to carbon dioxide, which has a GWP of 1. For example, methane has a GWP of 25, which means that 1 metric ton of methane will trap 25 times more heat than 1 metric ton of carbon dioxide, making it a more potent greenhouse gas. Some gases used in industrial applications can have a GWP thousands of times larger than that of CO₂. See Table 2.1 for a sample of common greenhouse gases and their global warming potential.

**Table 2.1
Greenhouse Gases and Global Warming Potential**

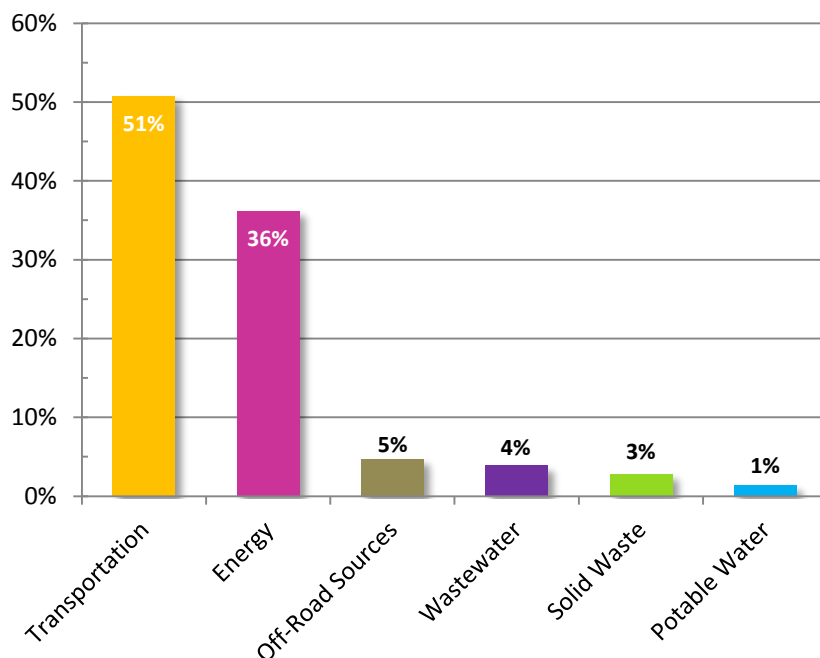
Common Name	Chemical Formula	Global Warming Potential (100-yr)
Carbon Dioxide	CO ₂	1
Methane	CH ₄	25
Nitrous Oxide	N ₂ O	298
Tetrafluoromethane (PFC-14)	CF ₄	7,390
Fluoroform (HFC-23)	CHF ₃	14,800
Sulfur Hexafluoride	SF ₆	22,800

Source: IPCC Fourth Assessment Report, Climate Change 2007ⁱ

BASELINE INVENTORY

Suisun City's baseline emissions inventory totals 112,663 MT CO₂e/yr in 2005. As shown in Figure 2.1, energy use is the largest contributor of GHG emissions in the city (51%), with transportation emissions contributing the majority of the remainder (36%). The energy and transportation sectors account for approximately 87% of total emissions, suggesting that local reduction efforts should focus on these areas. Off-road sources provide 5% of the inventory and waste emissions provide an additional 4%. Solid waste and potable water emissions are small contributors by comparison, making up the remaining 4% of the inventory. See Table 2.2 for the total emissions from each sector.

Figure 2.1 – 2005 Baseline Emissions by Sector



**Table 2.2
2005 Communitywide Emissions**

Emission Sector	Subsector	Emissions (MT CO₂e/year)	Communitywide Total (%)
Transportation		57,203	50.8%
	Passenger Vehicles	52,400	46.5%
	Commercial Vehicles	4,803	4.3%
Energy		41,087	36.2%
<i>Electricity Subtotal</i>		18,850	16.7%
	Residential	13,891	12.3%
	Commercial	4,959	4.4%
<i>Natural Gas Subtotal</i>		22,237	19.7%
	Residential	20,155	17.9%
	Commercial	2,081	1.8%
Off-Road Sources		5,268	4.7%
Wastewater	Wastewater Treatment	4,416	3.9%
Solid Waste		3,139	2.8%
Potable Water	Water Demand	1,550	1.4%
Total		112,663	100.0%

Source: AECOM 2013

Note: Columns may not total 100% due to rounding

EMISSIONS FORECASTS – 2020 AND 2035

The baseline inventory was used to project the future communitywide GHG emissions under a business-as-usual (BAU) scenario. Suisun City’s GHG emissions were forecast for the years 2020 and 2035, assuming that historic trends describing energy and water consumption, travel, and solid waste generation will remain the same in the future. Therefore, emissions forecasts demonstrate what emissions levels are likely to be under a scenario in which no statewide or local actions are taken to curtail emissions growth.

BAU emission forecasts provide insight regarding the scale of reductions necessary to achieve an emissions target before considering reductions likely to result from federal and statewide actions (e.g., vehicle efficiency standards), inherent technological advancements (e.g., energy-efficient appliances, lighting technology), or new voluntary or mandatory conservation efforts (e.g., landscape irrigation restrictions). The BAU emission forecasts also do not anticipate new sources of emissions or increased consumption rates in existing sectors. For example, as use of personal electronics, such as smartphones and tablets, increases emissions from electricity plug-load may also increase. Therefore, the only variable influencing the BAU forecasts is projected population and employment growth within the city.

The BAU forecasts use population and employment growth assumptions from the city’s 2035 General Plan Update. The city’s General Plan transportation consultant provided future VMT activity levels using assumptions based on buildout of the General Plan’s land use plan. The 2020 forecast year aligns with the AB 32 target year, while the 2035

forecast year aligns with the SB 375 planning horizon. These forecasts have been developed for planning purposes, and due to the complexity of each emissions sector and the uncertainty of future population and employment growth within the city, are subject to change. Therefore, as the 2020 and 2035 horizon years approach, the city will reevaluate its emissions projections to incorporate additional data points from periodic emissions inventories and revised city growth estimates. Regular emissions inventory updates will also help to assess progress towards the reduction targets, allowing the city to make revisions to CAP measures as necessary.

Table 2.3 shows Suisun City’s communitywide emission forecasts by sector for 2020 and 2035. Communitywide emissions are forecast to increase by approximately 15,718 MT CO₂e/yr (14.0%) between 2005 and 2020, and by approximately 31,947 MT CO₂e/yr (28.4%) between 2005 and 2035. See Appendix A for details regarding the emissions forecast methodology.

Table 2.3 Communitywide Emissions 2005-2035					
Emission Sector	2005 Emissions (MT CO ₂ e/yr)	2020 Emissions (MT CO ₂ e/yr)	Increase from 2005 (%)	2035 Emissions (MT CO ₂ e/yr)	Increase from 2005 (%)
Transportation	57,203	62,861	9.9%	69,090	20.8%
Passenger Vehicles	52,400	57,320	9.4%	63,071	20.4%
Commercial Vehicles	4,803	5,541	15.4%	6,020	25.3%
Energy	41,087	48,180	17.3%	55,274	34.5%
<i>Electricity Subtotal</i>	<i>18,850</i>	<i>22,104</i>	<i>17.3%</i>	<i>25,359</i>	<i>34.5%</i>
Residential	13,891	16,289	17.3%	18,688	34.5%
Commercial	4,959	5,815	17.3%	6,671	34.5%
<i>Natural Gas Subtotal</i>	<i>22,237</i>	<i>26,076</i>	<i>17.3%</i>	<i>29,915</i>	<i>34.5%</i>
Residential	20,155	26,635	17.3%	27,115	34.5%
Commercial	2,081	2,441	17.3%	2,800	34.5%
Off-Road Sources	5,268	6,177	17.3%	7,087	34.5%
Wastewater	4,416	5,178	17.3%	5,941	34.5%
Solid Waste	3,139	4,166	32.7%	5,133	63.5%
Potable Water	1,550	1,818	17.3%	2,085	34.5%
Total	112,663	128,381	14.0%	144,610	28.4%

Source: AECOM 2013

Note: Columns may not total 100% due to rounding

Impact of Statewide Actions

Most of Suisun City's anticipated emission reductions will come from statewide actions intended to help the state achieve its long-term emissions reduction goals. These actions are being applied throughout California, such as the state's building energy efficiency standards, and their local impact can be quantified to estimate Suisun City's share of these reductions. This CAP assumes that local emissions within the energy and transportation sectors will be reduced through the statewide efforts described in Chapter 1. This includes regulations addressing the use of renewable energy sources, energy efficiency, and GHG emissions from passenger cars and trucks. When the impact of these statewide actions is applied to Suisun City's BAU emission forecast, the resulting adjusted business-as-usual (ABAU) emissions levels begin to show progress towards future reduction targets.

This CAP also considers PG&E's future mix of electricity generation sources as planned through 2020, though this is not specifically a statewide action. In addition to its compliance with the state's Renewable Portfolio Standard (RPS), PG&E also anticipates that the non-RPS compliant portion of its portfolio will become cleaner as their use of natural gas increases and that of coal decreases. Natural gas releases less CO₂ than coal when burned, which will result in a de-carbonization of PG&E's electricity generation portfolio as this shift is implemented.

As part of future CAP updates, the city will monitor the effectiveness of state legislation to ensure that the anticipated level of reductions is achieved locally, and to ensure that all applicable statewide reductions are included.

The CAP includes locally-realized emissions reductions from:

- + SB 1078 (Renewable Portfolio Standard) + PG&E's de-carbonization estimates
- + AB 1109 (Lighting Efficiency)
- + California Title-24 Building Energy Efficiency Standards
- + AB 1493 (Pavley I and II)
- + EO-S-1-07 (Low Carbon Fuel Standard)
- + Vehicle Efficiency Regulations

Including only these statewide initiatives towards the GHG reduction targets is considered a conservative approach because ARB's Scoping Plan describes numerous other actions that will result in statewide emissions reductions. The actions included herein represent those for which a methodology is available to calculate Suisun City's likely share of these reductions. Other actions will provide statewide benefits, but cannot be accurately attributed to Suisun City at this time, and have therefore been omitted from the CAP's calculation of statewide actions.

Table 2.4 summarizes the anticipated reductions associated with these statewide actions in years 2020 and 2035. Figure 2.2 shows the trajectory of the BAU and ABAU emissions forecasts from baseline year 2005.

Table 2.4
2020 and 2035 Emission Reductions from Statewide Actions

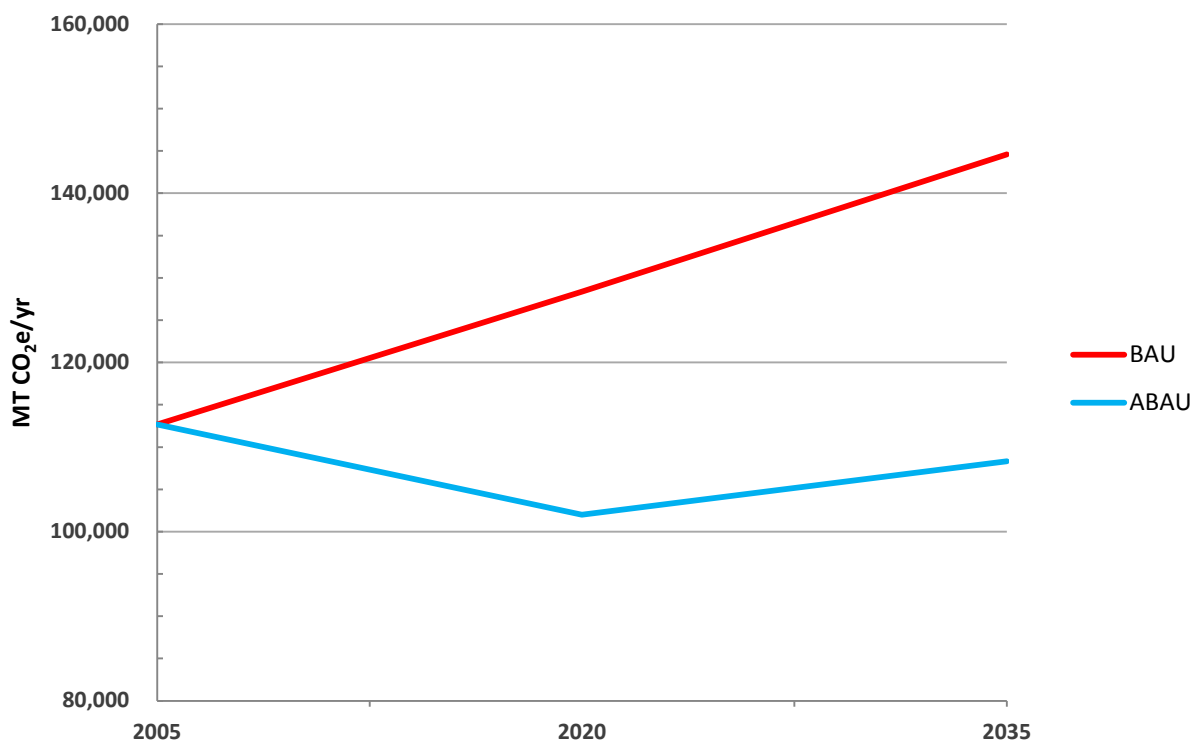
State or Federal Action	2020 Reduction (MT CO ₂ e/year)	2035 Reduction (MT CO ₂ e/year)
Renewable Portfolio Standard (33% by 2020) + PG&E De-carbonization	9,076	10,412
AB 1109 Lighting Efficiency	1,214	1,214
2013 California Building Energy Efficiency Standards	541	- ¹
Zero Net Energy Buildings Goal	- ²	2,225
Pavley I and II	11,185	18,122
Low Carbon Fuel Standard	4,232	4,061
Vehicle Efficiency Regulations	235	257
Total	26,483	36,291

Source: AECOM 2013

¹ Reductions from 2013 Building Energy Efficiency Standards are replaced in 2035 with the CEC's Zero Net Energy Buildings Goal to avoid double counting emissions reductions with overlapping statewide actions;

² The CEC's Zero Net Energy Buildings Goal is intended to take effect beginning in 2020 for residential buildings and 2030 for nonresidential buildings.

Figure 2.2 – Business as Usual (BAU) and Adjusted Business as Usual (ABAU) Emissions



Emission Reduction Targets

The purpose of a reduction target is to enable the city to achieve future GHG emissions reductions in a manner that supports statewide efforts, and complies with recent revisions to the California Environmental Quality Act (CEQA) guidelines to allow CEQA streamlining benefits. See Appendix B for a further description of the target setting rationale presented here.

MASS EMISSIONS AND EFFICIENCY THRESHOLDS

Targets can be expressed as either mass emissions reductions or efficiency thresholds. Mass emissions targets establish an absolute emissions level to be achieved by a target year, such as 100,000 MT CO₂e/yr by 2020. Typically, mass emissions targets are expressed as a percent below the emissions level of some baseline year, such as 15% below 2005 by 2020. Alternatively, efficiency thresholds set a target level of emissions per population or per service population (i.e., population plus local jobs), such as 6.6 MT CO₂e/SP/yr. Efficiency thresholds demonstrate a city's ability to grow population and employment, while emissions shrink on a per unit basis; in effect, a city could be growing more efficiently from an emissions standpoint. In this case, total emissions within a city may increase while still achieving an efficiency target, as long as service population is growing faster than emissions. Both types of targets are useful to consider when selecting an appropriate emissions reduction target for a community.

It is anticipated that the Governor's Office of Planning and Research will provide future guidance regarding preparation of plans for the reduction of GHG emissions. This guidance may identify mass emissions reduction targets as preferable to the use of efficiency metrics at the communitywide planning level, in order to ensure that each jurisdiction in California makes progress towards actual mass emissions reductions. However, at the time of this CAP's preparation there was no state-level guidance requiring local governments to adopt specific reduction targets.

TARGET SETTING CONSIDERATIONS

The city considered a range of GHG emission reduction targets during plan preparation. In making its target selection, the city weighed numerous factors, such as:

- + existing California climate change legislation, direction from ARB, and guidance from California air districts;
- + general understanding of the probable range of GHG reduction opportunities from various types of local and statewide measures;
- + the range of targets and goals set by other Solano County jurisdictions who have completed CAPs; and
- + the feasibility of achieving different GHG targets.

State Legislation and Guidance

The underlying purpose of AB 32 is to take state action that will result in an **absolute reduction** in the atmospheric level of carbon dioxide and other greenhouse gases, which contribute to the impacts commonly associated with climate change. Therefore, the state has set mass emissions reduction targets at the statewide level.

In 2005, Executive Order S-3-05 identified California’s vulnerability to the impacts of GHG emissions. The Executive Order established a long-range GHG reduction target of 80% below 1990 levels by 2050. Subsequently, AB 32, the California Global Warming Solutions Act of 2006 was signed, requiring California to reduce *statewide* GHG emissions to 1990 levels by 2020.

AB 32 also directed ARB to develop and implement regulations that reduce statewide GHG emissions. ARB approved *The Climate Change Scoping Plan* (Scoping Plan) in December 2008, which outlines the state’s plan to achieve the GHG reductions required in AB 32. The Scoping Plan does not define the specific role local governments, like the City of Suisun City, will play in meeting the state’s GHG reduction goals, but does identify cities and counties as “essential partners” within the overall statewide effort.

However, many local governments do not have sufficient historical data available to prepare a 1990 baseline emissions inventory, which would allow local governments to establish reduction targets that exactly mimic the state’s own targets. In the 2008 Scoping Plan, ARB “encourages local governments to adopt a reduction goal for municipal operations emissions and move toward establishing similar goals for community emissions that parallel the state commitment to reduce greenhouse gas emissions by approximately 15 percent from current levels by 2020.”ⁱⁱ

Based on this language, many communitywide CAPs select a reduction target of 15% below baseline levels by 2020 to parallel the state’s target. Some CAPs also establish a longer-term target to show the city’s trajectory towards the state’s 2050 goal of 80% below 1990 levels.

California Environmental Quality Act

The City of Suisun City intends to proactively use the tiering benefits provided under CEQA for communities that have adopted a “... local plan for the reduction or mitigation of GHG emissions” pursuant to SB 97 and State CEQA Guidelines Section 15183.5. If the CAP is prepared in a manner that meets the framework set forth in the CEQA Guidelines, the city can tier from the CAP’s CEQA document for the cumulative GHG emissions analysis of future development projects that are consistent with the CAP, eliminating the need for project-specific GHG analysis and mitigation measures.

State CEQA Guidelines Section 15183.5 establishes criteria that a GHG reduction plan, such as Suisun City’s CAP, should meet in order to provide for streamlining of future development projects consistent with the plan. In general, such plans should:

- + Quantify GHG emissions within a defined area,
- + Establish a level where GHG emissions are not cumulatively considerable,
- + Identify emissions from activities covered by the plan,
- + Specify measures to achieve the emissions reduction goal,
- + Monitor progress and amend if necessary, and
- + Be adopted in a public process following environmental review.

Section 15183.5(b)(1)(B) specifically requires that a GHG reduction target must “Establish a level, below which the contribution to [GHG] emissions from activities covered by the plan would not be cumulatively considerable.” To comply with this provision within the guidelines, a reduction target must be based on substantial evidence.

Air Quality Management District Guidance

Several air districts and state agencies (including the Bay Area Air Quality Management District (BAAQMD) and ARB) have established substantial evidence associated with recommended communitywide emissions reduction targets. Since two of the participating cities in this CAP effort are within the BAAQMD jurisdiction (including the City of Suisun City), and because YSAQMD has not established its own thresholds of significance for GHG emissions, the participating cities decided to consider BAAQMD's guidance when selecting their reduction targets.

As previously mentioned, the 2008 Scoping Plan presents substantial evidence recommending local agencies seek to reduce communitywide emissions by 15% below current emission levels by 2020. In 2010, BAAQMD also adopted CEQA Air Quality Guidelines that presented substantial evidence for three communitywide emissions reduction targets: 1) 1990 levels by 2020, 2) 15% below current (2008 or earlier) levels by 2020, or 3) use of an efficiency threshold of 6.6 MT CO₂e/yr per service population (i.e., residents plus employees) by 2020. This efficiency threshold is intended to be used only in the context of general or communitywide plans, not individual development projects.

However, BAAQMD's June 2010 adopted thresholds of significance were challenged in a lawsuit, and the Alameda County Superior Court issued a judgment finding in 2012 that the Air District had failed to comply with CEQA when it adopted the thresholds. The court found that the adoption of the thresholds was a project under CEQA and ordered the Air District to examine whether the thresholds would have a significant impact on the environment under CEQA before recommending their use. The court issued a writ of mandate ordering the Air District to set aside the thresholds and cease dissemination of them until the Air District had complied with CEQA. In view of the trial court's order, which remains in place pending final resolution of the case, the Air District is no longer recommending that the thresholds be used as a generally applicable measure of a project's significant air quality impacts.

However, the court did not determine whether the thresholds are or are not based on substantial evidence and thus valid on the merits. Therefore, cities could continue to rely on the substantial evidence based on statewide data and analysis relative to AB 32 that underlies the June 2010 BAAQMD thresholds when making an independent determination of significance of plan-level GHG impacts pursuant to State CEQA Guidelines Section 15064.7(c).

The logic behind BAAQMD's efficiency target is that if all California communities achieved the same level of efficiency on a "fair-share" per service population basis, then the state would achieve its AB 32 GHG reduction goal for 2020. The target metric was calculated by dividing total statewide land use-generated emissions in 2020 by the total population and jobs projected in the state in 2020, as shown in Table 2.5.

Building upon this logic, the project team further refined the efficiency threshold targets, and projected them towards the state's 2050 reduction target at ten-year intervals (with a 2035 target included for consistency with the SB 375 horizon year). Table 2.6 demonstrates the calculation of efficiency level thresholds that were considered as possible targets by the participating cities in development of their CAPs.

Table 2.5
Statewide Efficiency Level Threshold - 2020

	2020 Horizon Year
Population ¹	40,643,643
Employment ²	18,994,360
Service Population (SP)	59,638,003
Emissions Level Target ³	395,830,000 MT CO ₂ e/yr
Emissions per SP	6.6 MT CO ₂ e/SP/yr

Source: Adapted by AECOM, 2013

¹ Population from California Department of Finance 2013 Forecasts

² Employment is from EDD, extrapolated from 2018 estimates to 2020

³ Represents the 2020 horizon year target, which is a return to 1990 emission levels, as represented in the ARB California Greenhouse Gas Inventory for 1990. Includes only the Energy and Waste sectors from the 1990 inventory. The Industrial Processes and Product Use sector and Agriculture, Forestry, and Other Land Use sector were omitted because their emissions are not derived from urban development activities (e.g., residential construction, commercial development).

Table 2.6
Efficiency Threshold Targets through 2050

	2020	2030	2035	2040	2050
Population ¹	40,643,643	44,279,354	46,083,482	47,690,186	50,365,074
Total Employment ²	18,994,360	20,693,470	21,536,609	22,287,484	23,537,564
Total Employment minus Farm, Mining, Logging, Manufacturing ²	17,314,380	18,863,210	19,631,777	20,316,240	21,455,755
Total Service Population	59,638,003	64,972,824	67,620,091	69,977,670	73,902,638
Total Service Population minus Farm, Mining, Logging, Manufacturing	57,958,023	63,142,564	65,715,259	68,006,426	71,820,829
Emissions Level Target ³ (MT CO ₂ e/yr)	264,100,000	193,673,333	158,460,000	123,246,667	52,820,000
Emissions per Service Population (MT CO ₂ e/SP/yr)	4.6	3.1	2.4	1.8	0.7

Source: AECOM, 2013

¹ Population from California Department of Finance 2013 Forecasts

² Employment is from EDD, extrapolated from 2018 estimates to 2020. Then, extrapolated to 2035 based on population to land-use-related job ratio in 2020. Non-farm, mining, logging, manufacturing estimate for 2030 and beyond is based on 2020 ratio between total employment and non-land use employment.

³ Further revisions were made to emissions in the Energy and Waste sectors that were included in Table 2.5. In general, revisions were made to exclude industrial emissions across all sectors, national security emissions, and certain transportation-related emissions, such as aviation and water borne transportation. See Appendix B for further detail on the calculation of this revised 2020 emissions levels. The revised 2020 emissions level then represents a 1990 baseline, which is used to calculate the 2050 emissions level target (i.e., 80% below the 2020 level shown here). Emissions level targets for intermediary years were projected using linear growth calculations.

Local Government Targets in Solano County

The participating cities also considered the GHG emission reduction targets established in adopted or proposed CAPs prepared by other jurisdictions in Solano County, which include:

- + City of Benicia CAP – 10% below 2000 levels by 2020
- + City of Vacaville Draft CAP – 21.7% below 2020 BAU levels by 2020
- + City of Vallejo CAP – 15% below 2008 levels by 2020
- + Solano County CAP – 20% below 2005 levels by 2020

Although different targets and baseline years (or horizon year in the case of Vacaville) are used by each jurisdiction, each of these targets aims to be consistent with the statewide goals of AB 32, and with either the Scoping Plan or more recent ARB statewide projections consistent with the Scoping Plan. In other words, they all meet or exceed AB 32 requirements for 2020. Additionally, none of these jurisdictions have established targets for the 2035 timeframe.

TARGET OPTIONS CONSIDERED

As part of their collaborative CAP development effort, Suisun City and the other participating cities have chosen to establish 2020 and 2035 targets that meet the following criteria:

- + Are realistic and achievable
- + Consider impacts of statewide and local actions
- + Parallel statewide emissions reduction targets
- + Are based on substantial evidence to allow CEQA streamlining benefits

While adherence to these criteria has resulted in the selection of different targets among the participating cities, mass emissions targets were selected, when feasible, to demonstrate consistency with the state's absolute emissions reduction efforts (in contrast to an efficiency target as described above). Ultimately, targets were chosen to respond to the unique characteristics of each community while still demonstrating a significant local contribution to the state's emissions reduction goals.

As part of ABAG's 2014-2022 regional housing needs allocation cycle, Fairfield and Suisun City both accepted a higher share of the Solano County subregional housing needs allocation than they otherwise might have been assigned compared to Dixon and Rio Vista. This resulted in higher emissions growth rates in Fairfield and Suisun City due to higher growth projections, making the achievement of a mass emissions target more difficult than for Dixon and Rio Vista.

Mass Emissions Target Option

Table 2.7 shows the reductions that would be required in Suisun City under a mass emissions target for 2020 and 2035. Table 2.7 also shows the reductions contributions attributable to statewide actions, and the remaining emissions reduction gap to be addressed by the local actions presented in Chapter 3. Figure 2.2 illustrates the same information with a red line showing the city's emissions trajectory towards 2035 and a blue line representing ABAU emissions to show the impact of statewide actions. The gray line shows the necessary emissions trajectory to achieve a near-term 2020 target

and a longer-term 2050 target, with a dashed line marking an interim 2035 target. The table and figure both show a gap between the mass emissions targets and the ABAU forecasts, indicating a role for local actions in achieving these targets.

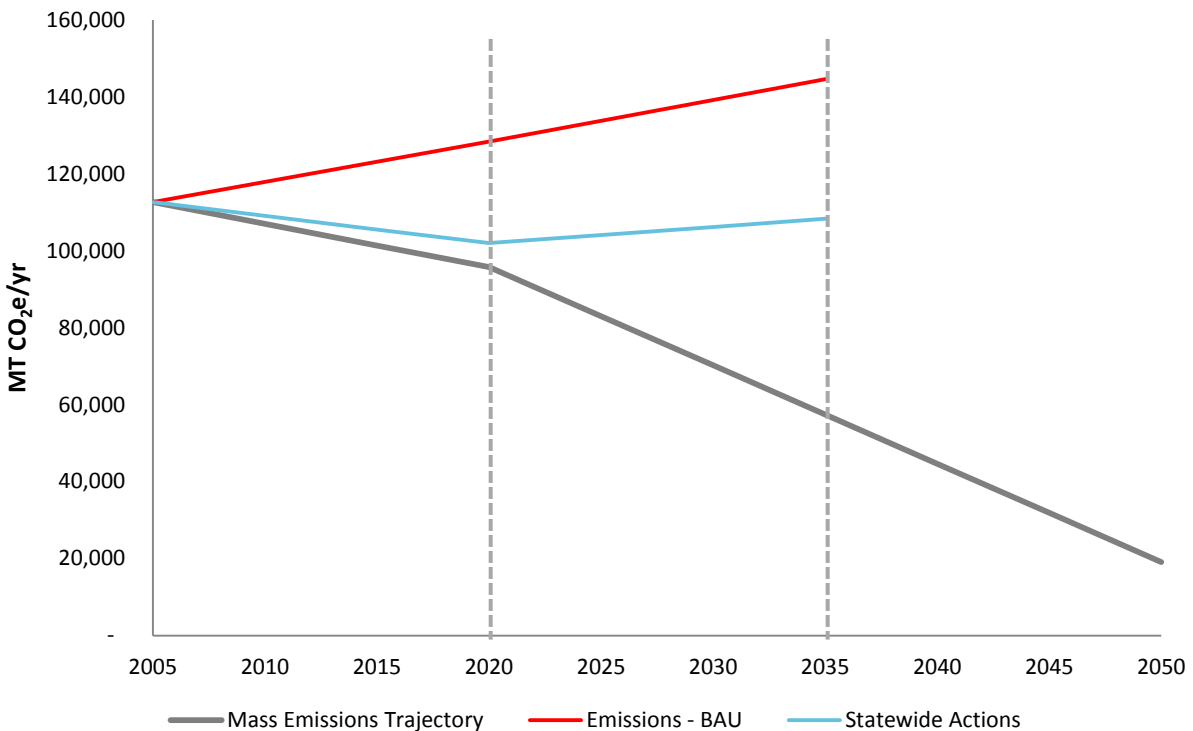
The city's proposed local actions were quantified to determine if a mass emissions target was realistic and achievable given its growth forecast. It was determined that, even with aggressive implementation estimates, the city would still struggle to achieve a mass emissions target by 2020 because new growth would occur at a faster pace than local reductions measures could accommodate. However, Suisun City's ability to accommodate increased population and employment growth could support achievement of an efficiency threshold target.

Table 2.7
Mass Emissions Reduction Targets

	2005 (MT CO ₂ e/yr)	2020 (MT CO ₂ e/yr)	2035 (MT CO ₂ e/yr)
Inventory and BAU Projections	112,663	128,381	144,610
Reduction Target		95,764	57,458
Reductions Needed to Achieve Target		32,617	87,152
Assumed Statewide Reductions		26,483	36,291
Local Action Reductions Needed to Achieve Targets		6,134	50,861

Source: AECOM 2013

Figure 2.3 – Mass Emissions Reduction Target Option



Efficiency Threshold Target Option

Table 2.8 uses the statewide efficiency targets shown in Table 2.6 as the local emissions targets by applying Suisun City's projected service population. As previously described, this type of target could allow mass emissions to increase, while still reducing per capita GHG emissions. Table 2.8 shows that under an efficiency threshold approach, the city's 2020 target would be 4.6 MT CO₂e/SP/yr, while BAU emissions forecasts are only 3.4 MT CO₂e/SP/yr. Statewide actions would reduce the emissions forecasts even further, indicating that no local actions would be required to achieve the 2020 target. However, Figure 2.3 shows a steep trajectory toward a long-term 2050 efficiency threshold target. Therefore, the city decided that in order to make progress on future emissions targets, it was important to develop local actions as part of this CAP. The measures developed in Chapter 3 establish a local framework for future emissions reduction activities, and leverage regional participation to find cost effective implementation opportunities.

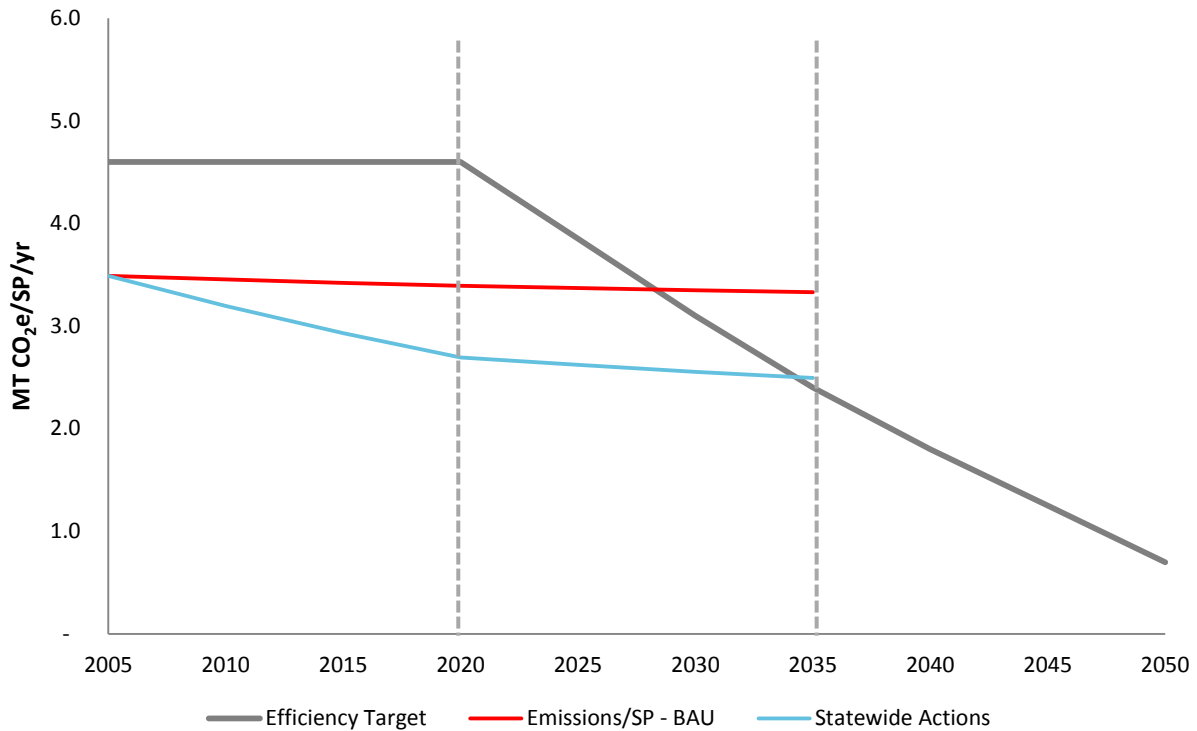
Table 2.8 Efficiency Threshold Reduction Targets			
	2005	2020	2035
Service Population (population + employment)	32,280	37,853	43,426
Inventory and BAU Projections (MT CO ₂ e/yr)	112,663	128,381	144,610
BAU Efficiency Level (MT CO ₂ e/SP/yr)	3.5	3.4	3.3
Efficiency Level Target (MT CO ₂ e/SP/yr)	-	4.6	2.4
Efficiency Level Target (MT CO ₂ e/yr)		174,124	104,222
Reductions Needed to Achieve Target ² (MT CO ₂ e/yr)		0	40,388
Assumed Statewide Reductions (MT CO ₂ e/yr)		26,483	36,291
Local Action Reductions Needed to Achieve Targets		0	4,097

Source: AECOM 2013

¹ Per Table 2.6

² 2020 efficiency level target is greater than 2020 forecast emissions, which means the city would achieve its 2020 target without statewide or local actions

Figure 2.4 – Efficiency Target Option



SUISUN CITY’S EMISSIONS REDUCTION TARGETS

Based on the estimated growth projected in the city through 2035 and each of the target setting considerations described above, Suisun City has selected the following efficiency threshold reduction targets for 2020 and 2035:

- + **2020:** 4.6 MT CO₂e/SP/yr
- + **2035:** 2.4 MT CO₂e/SP/yr

These targets allow the city to demonstrate contributions toward statewide absolute emissions reductions, while accommodating regional population and employment growth. The targets also provide opportunities for future CEQA streamlining benefits based on the substantial evidence supporting these metrics found in the Scoping Plan and BAAQMD’s June 2010 thresholds of significance. These targets are consistent with those selected by the other participating cities (in that they show a trajectory towards long-term reduction targets), which further supports the regional collaboration established during plan development. The 2020 target is directly related to the previously described guidance from ARB and BAAQMD, whereas the 2035 target represents consistency with a linear trajectory towards the state’s long-term target of 80% below 1990 levels by 2050.

2020 Emissions Reduction Target

Based on the 2005 emissions inventory and 2020 forecasts presented in this chapter, the 2020 communitywide emissions reduction target is 174,124 MT CO₂e/yr (i.e., 4.6 MT CO₂e/SP/yr). No statewide or local reductions would be required in 2020 to achieve this target, based on the service population growth estimates used to develop the emissions

forecasts. However, the 2020 statewide reductions identified in Table 2.4 would still contribute emissions reductions totaling 26,483 MT CO₂e/yr.

2035 Emissions Reduction Target

Achieving the 2035 communitywide emissions reduction target of 104,222 MT CO₂e/yr (i.e., 2.4 MT CO₂e/SP/yr) would require reductions totaling 40,388 MT CO₂e/yr. Statewide reductions identified in Table 2.4 would contribute 36,291 MT CO₂e/yr, leaving a reductions gap of 4,097 MT CO₂e/yr to be addressed through local actions and additional or enhanced statewide actions.

Notes

ⁱ International Panel on Climate Change. *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007*. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.). [Cambridge University Press](http://www.cambridge.org/9780521146638), Cambridge, United Kingdom and New York, NY, USA. Available at: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html.

ⁱⁱ California Air Resources Board. *Climate Change Scoping Plan: a Framework for Change*. December 2008. Available at: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf.

CHAPTER 3

EMISSIONS REDUCTION MEASURES

3

This chapter describes measures and actions that would be needed to reduce communitywide greenhouse gas (GHG) emissions, and achieve the city's 2020 and 2035 reduction targets. Most measures are designed to achieve quantifiable GHG reductions, while others are listed as supporting measures because they cannot be accurately quantified. To ensure proper implementation, each measure is accompanied by a description providing policy background and implementation details that articulate necessary actions; city departments with primary action responsibility; and progress indicator timelines to track implementation. The city will evaluate effectiveness of CAP measures and actions every three years and propose program modifications if necessary to achieve reduction targets.

Summary of Reductions

Table 3.1 summarizes GHG emission reductions anticipated from implementation of the measures and actions presented in this chapter and the statewide reductions described in Chapter 2. These measures, as well as unquantified supporting measures, are described in detail throughout this chapter to describe how each contributes to emissions reductions and how they will be implemented in Suisun City. A target achievement discussion is presented at the end of this chapter to show how the city can achieve its 2020 reduction target, and what steps should be taken to put the city on a path towards achievement of longer-term emissions reduction targets.

Table 3.1 Measures and Quantified Reductions			
ENERGY STRATEGY		2020 (MT CO₂e/yr)	2035 (MT CO₂e/yr)
E-1. Existing Buildings			
E-1.1	Energy Efficiency Retrofit Outreach	259	810
E-2. New Construction			
E-2.1	New Construction Energy Efficiency	25	. ¹
E-4. Building Appliances			
E-4.1	ENERGY STAR Appliances	57	127
E-4.2	Smart Grid	219	566
E-5. Building Cooling			
E-5.1	Building Shade Trees	86	173
E-7. Renewable Energy			
E-7.1	Solar Photovoltaic Systems	1,065	1,687
E-7.2	Solar Water Heaters	77	433
E-7.3	Community Choice Aggregation	0	. ²
E-8. Street and Area Lighting			
E-8.1	Street Light Upgrade	59	59
E-8.2	Traffic Light Upgrade	2	2
E-8.3	Parking Lot Lighting Upgrade	22	90
E-9. Municipal Actions			
E-9.1	Municipal Building Energy Efficiency	32	39
E-9.2	Wastewater Treatment Plant Process Energy Optimization	171	171
Energy Subtotal		2,074	4,158
TRANSPORTATION AND LAND USE STRATEGY		2020 (MT CO₂e/yr)	2035 (MT CO₂e/yr)
T-4.1	Alternative Fuel Vehicles	747	. ²
T-5.1	Transportation Demand Management	135	211
Subtotal Transportation and Land Use		882	211

WATER STRATEGY		2020	2035
		(MT CO₂e/yr)	(MT CO₂e/yr)
W-1.1	SB X7-7	522	763
Subtotal Water		522	763
SOLID WASTE STRATEGY		2020	2035
		(MT CO₂e/yr)	(MT CO₂e/yr)
SW-2.1	Residential Food Scrap Diversion	13	400
SW-2.2	Commercial Food Scrap Collection	5	69
SW-2.3	Yard Waste Diversion	54	171
SW-2.4	Construction and Demolition Waste	60	289
Subtotal Solid Waste		132	929
GREEN INFRASTRUCTURE STRATEGY		2020	2035
		(MT CO₂e/yr)	(MT CO₂e/yr)
GI-1.1	Urban Forest Program	586	1,171
Subtotal Green Infrastructure		586	1,171
SUBTOTAL CAP MEASURES		4,196	6,991
STATEWIDE REDUCTIONS			
Renewable Portfolio Standard + PG&E De-Carbonization		9,076	10,412
AB 1109 – Lighting Efficiency Program		1,214	1,214
2013 California Building Energy Efficiency Standards		541	- ³
Zero Net Energy Buildings Goal		- ⁴	2,225
Pavley I and II		11,185	18,122
Low Carbon Fuel Standard		4,232	4,061
Vehicle Efficiency Regulations		235	257
Subtotal		26,483	36,291
TOTAL REDUCTIONS		30,679	42,999

Note: Subtotals and totals may not appear to add correctly due to rounding.

¹ Included in 2035 statewide calculation for zero net energy building goal;

² See *Progress toward 2035 Target* discussion at end of chapter for additional detail;

³ Reductions from 2013 Building Energy Efficiency Standards are replaced in 2035 with the CEC's Zero Net Energy Buildings Goal to avoid double counting emissions reductions with overlapping statewide actions;

⁴ The CEC's Zero Net Energy Buildings Goal is intended to take effect beginning in 2020 for residential buildings and 2030 for nonresidential buildings.

Measure Structure

This chapter is organized according to six strategy areas: cross-cutting strategies, energy, transportation, water, solid waste, and green infrastructure. These strategies represent the primary avenues by which to reduce communitywide GHG emissions in Suisun City. Each strategy area section begins with an introduction to the overarching concepts that tie that particular strategy to GHG emission generation and potential reductions. The strategy overview is followed by the specific measures and actions that translate the city's vision into on-the-ground implementation.

REDUCTION MEASURES

Measures define the programs, policies, and projects that the city will undertake to accomplish its GHG emission reduction goals. Each measure includes information related to GHG reduction potential, opportunities for regional implementation, sustainability co-benefits, and relative magnitude of cost.

REDUCTION POTENTIAL

The estimated annual emissions reduction potential of each quantifiable measure is provided for 2020 and 2035 in MT CO₂e/yr. Some measures have the same reduction potential for both horizon years because the underlying participation assumptions are held constant. Measures identified as "Supporting Measures" contribute to GHG reductions and are an important component of this CAP, but currently lack a methodology to quantify their emissions reduction potential. For example, the proposed sustainability coordinator position described in Measure CC-1.1 is critical to the full implementation of other CAP measures, but it is not possible to accurately calculate the emissions reductions specifically related to that new staff position. Appendix B describes the methodology used to quantify emissions reductions.

ICONS

Graphic icons are used in this chapter to indicate measures that have regional implementation opportunities, sustainability co-benefits associated with the measures, and simple cost estimates for mandatory components of measures. Figure 3.1 presents the icons found throughout this measure.

Regional Efforts

Measures that would benefit from a regional implementation strategy are denoted as Regional Efforts. The four participating cities (i.e., Suisun City, Dixon, Fairfield, and Rio Vista) could collaborate on implementing these measures to reduce overhead costs associated with new program development, or could partner with other regional agencies to create a sustainability coordinator position to oversee CAP implementation.

Co-Benefits

As described in Chapter 1, implementation of these measures will provide additional community benefits beyond their GHG reductions. The icons listed with each measure represent only a sample of the numerous co-benefits related to individual measures.

Cost Analysis

Some CAP measures require residents and local businesses to take action or direct the city government to develop and implement additional programs. Simple cost estimates (i.e., Very Low, Low, Medium, High) for these mandatory actions are provided for informational purposes to help weigh the potential costs and benefits of certain measures. Cost analysis was not performed for measures that describe current and on-going city programs and actions, or voluntary measures that rely on residents and businesses to make personal decisions regarding the importance and value of certain actions. Appendix C provides assumptions used to calculate these simple cost estimates.

Figure 3.1 – CAP Measure Co-Benefits



MEASURE BACKGROUND

The measure background section provides information about the specifics of a measure, including descriptions of various technologies or financing mechanisms. This section also provides information on currently available rebates and other financial incentives related to the measure, and describes any actions the city has taken to date towards implementation of that measure. Additionally, some descriptions provide guidance that will be used in program implementation, such as components of the outreach plan and which segments of the community should be targeted for inclusion.

ACTIONS AND PROGRESS INDICATORS

Action steps and progress indicators are provided in a table following each measure description. Actions identify specific steps that the city will take to implement the measure. The table also identifies responsible departments or agencies that would be best positioned to lead or provide input for implementation of certain tasks. Measures that could be implemented by a regional Sustainability Coordinator, as described in Measure CC-1.1, are identified should the participating cities secure funding for such a position. In most cases, an alternative responsible department is also listed in the event that a sustainability coordinator position cannot be established.

Progress indicators describe the specific action that is being quantified to estimate the reduction potential. These indicators enable city staff, the City Council, and the public to track implementation and monitor overall CAP progress. Progress indicators are provided for both 2020 and 2035, where applicable, and are specifically described when possible with quantified metrics, such as square feet (sq ft) renovated, number of solar hot water heaters installed, or number of employees participating in commute reduction programs. Progress indicators are not provided for supporting measures, which do not have quantifiable emissions reductions.

Reduction Strategies

The strategies identified in this Chapter affect issues within the city's direct influence. Each strategy is subdivided into various sub-strategy headings to help organize the reduction measures. Measures were developed by (a) evaluating existing community conditions, (b) identifying emission reduction opportunities within the community, (c) reviewing best practices from other jurisdictions and organizations, and (d) incorporating State and regional laws, guidelines, and recommendations. Suisun City's measures were also developed as part of a regional conversation between the cities of Dixon, Fairfield, and Rio Vista to provide as much consistency between the four cities CAPs as possible. The adopted CAPs for Solano County and the Cities of Benicia and Vallejo were also reviewed as part of the measure development process to lay the foundation for regional implementation efforts.

The emission reduction strategies are as follows:

- + **Cross-Cutting:** The Cross-Cutting Strategy describes overarching opportunities for regional implementation, but does not include estimates for direct emissions reductions.

- + **Energy:** The Energy Strategy recommends ways to increase energy efficiency in existing buildings, enhance energy performance for new construction, and increase use of renewable energy.
- + **Transportation:** The Transportation Strategy encourages transit, carpooling, walking, and bicycling as viable transportation modes to decrease the need to drive.
- + **Water:** The Water Strategy promotes the efficient use and conservation of water in buildings and landscapes.
- + **Waste:** The Waste Strategy increases waste diversion and recycling, reducing consumption of materials that otherwise end up in landfills.
- + **Green Infrastructure:** The Green Infrastructure strategy suggests ways to enhance the existing urban forest.

Cross-Cutting Strategies

During CAP development, the participating cities identified a need for regional support in the CAP implementation process. Numerous measures were designed to be implemented through collaboration to leverage limited resources and convey a consistent message throughout the county. The following two measures represent this overarching strategy of regional collaboration.

Measure CC-1.1: Sustainability Coordinator

Supporting Measure – Not Quantified

Establish a full-time regional sustainability coordinator to monitor CAP implementation and promote regional sustainability efforts. Explore opportunities to partner with other Solano County governments on this effort (e.g., City of Benicia, Solano County).



Measure Background

Implementation of the following measures described in this CAP will likely require an effort that surpasses the available capacity of existing city staff. Further, numerous measures are identified as “Regional Opportunities” that would benefit from collaboration among the different Solano County governments. Therefore, the participating cities recommended the creation of a regional sustainability coordinator position, which could oversee implementation of CAP measures that rely on regional collaboration.

The sustainability coordinator would act as a liaison between local governments, residents, and businesses in Solano County to implement and track progress of CAP measures and actions. A regional approach would provide implementation efficiencies

on certain measures, and would also help to disseminate best practices information to the local governments regarding other measures. The sustainability coordinator could also act as the point of contact for various regional agencies, including STA, PG&E, the Solano EDC, and the Solano Center for Business Innovation. This would allow one person to gain experience in facilitating implementation of the various programs described throughout this CAP, as opposed to multiple employees of each local government having to coordinate their efforts.

In recent years, several city and county governments have been able to sponsor a full-time sustainability coordinator position through American Reinvestment and Recovery Act (ARRA) grant funding or similar programs. The city will collaborate with other local governments to identify and pursue grant funding to establish a regional sustainability coordinator position.

Action	Responsibility
A Secure funding for regional Sustainability Coordinator position.	Planning Division; Solano EDC
B Coordinate with other Solano cities and the county to prioritize regional sustainability issues and programs for joint implementation.	Planning Division; Solano EDC

Measure CC-1.2: Public Outreach

Supporting Measure – Not Quantified

Develop coordinated outreach campaign to fulfill the public outreach components recommended throughout this CAP.



Measure Background

Community engagement and effective participation are essential to the successful implementation of this CAP. During the CAP implementation period, the city will conduct outreach programs that involve residents and businesses in various activities, assessments, and actions.

Effective public participation will increase the likelihood that the measures recommended in this plan achieve estimated participation rates. Furthermore, Suisun City will see higher participation rates if outreach and education programs are adapted over time to meet the changing needs of the community. Increased participation rates will result in increased emissions reductions.

At the start of each fiscal year, the city will work with local stakeholders to determine the outreach priorities of the community, which could be a certain segment of the community (e.g., a group of neighborhoods, the agricultural community, the retail sector) or a specific action (e.g., carpooling, biking, lighting). Outreach priorities should be related to measures described in the CAP. The city will strive to designate at least one outreach event per quarter to address the chosen priority areas. The city could also

designate one week per year to conduct a high-profile outreach campaign targeting a specific measure or strategy area. The campaign week could also be used to recognize community members or businesses that have implemented major improvements.

Numerous measures described in this chapter would benefit from a website that could serve as a central source of information on resource conservation strategies, technical assistance for a variety of topics, and a clearinghouse for rebates and other financial incentives to help implement CAP strategies. The city will work with the Sustainability Coordinator and other local governments to develop a Solano County Sustainability Website that will be a resource for all residents and businesses in the county.

Action	Responsibility
A Work with local stakeholders to determine the CAP outreach priorities for the year.	Planning Division
B Designate at least one outreach event per quarter to address the priority areas.	Planning Division
C Conduct a high-profile energy efficiency outreach campaign; recognize community members that have implemented major improvements.	Sustainability Coordinator
D Partner with other Solano County governments to develop a county sustainability website.	Sustainability Coordinator

Energy Strategy

As described in Chapter 2, the consumption of electricity for appliances, lighting, and cooling, and combustion of natural gas for heating, cooking, and other processes within residential, commercial, and industrial buildings generated approximately 36% of Suisun City's communitywide GHG emissions in 2005. These emissions can be reduced by improving energy efficiency in new and existing buildings and increasing the amount of electricity and heat generated from renewable energy sources.

In Suisun City, approximately 42%ⁱ of the housing stock was built before California's energy code, Title 24 Part 6, was first adopted in 1978. Consequently, the building stock offers considerable opportunity for cost-effective energy efficiency retrofits to decrease the use of both electricity and natural gas. The city plans to achieve building energy efficiency improvements in both existing and new buildings through a combination of community outreach and education, incentives, and regulations.

Pacific Gas and Electric Company (PG&E) is Suisun City's energy utility, providing both natural gas and electricity for residential, commercial, industrial, and municipal uses. PG&E provides electricity generated at hydroelectric, nuclear, renewable, natural gas, and coal facilities. As of 2011, natural gas facilities provided 25%; nuclear plants provided 22% of the total electricity supply; renewable energy facilities including solar, geothermal, and biomass provided 19%; large hydroelectric operations provided 18%; and unspecified sources provided the remainder.ⁱⁱ Under the provisions of SB 107 (2006), investor-owned utilities were required to generate 20% of their retail electricity using qualified renewable energy technologies by the end of 2010. In compliance with this mandate, PG&E will expand its renewable generation portfolio, making additional GHG-free electricity available to customers in Suisun City. In 2011, PG&E delivered 19% of total electricity from eligible renewable sources.

The city will encourage communitywide installation of rooftop solar photovoltaic (PV) and solar hot water systems to increase the portion of Suisun City's energy portfolio provided from renewable sources. The city will also explore installation of renewable energy facilities on municipal property to increase the generation of renewable energy in the community.

The total GHG emission reduction potential of the Energy Strategy is 2,074 MT CO₂e/yr in 2020. This represents about 7% percent of total 2020 reductions.

E-1: Existing Buildings

Measure E-1.1: Energy Efficiency Retrofit Outreach

2020 GHG Reduction Potential: **259 MT CO₂e/yr**

2035 GHG Reduction Potential: **810 MT CO₂e/yr**

Encourage voluntary energy efficiency retrofits in residential and nonresidential buildings through promotion of local efforts.



Measure Background

Energy efficiency improvements to residential and nonresidential structures can reduce both energy bills and GHG emissions. Many residences (approximately 65 percentⁱⁱⁱ) in Suisun City are owner-occupied, and thus the financial savings of home energy efficiency retrofits are in the long term economic interest of the homeowner. As such, the city will emphasize voluntary participation in energy efficiency retrofit programs, in lieu of mandatory programs. As part of the outreach program, the city will enhance its website by linking to information on existing energy efficiency rebates and other financial incentives, including PG&E incentives to businesses for energy efficiency improvements. The website could also contain local case studies of businesses that have completed cost effective energy efficiency improvements.

Energy Upgrade California is a statewide initiative to help Californians take action to save energy and conserve natural resources, help reduce demand on the electricity grid, and make informed energy management choices at home and at work. As such, it will be important to leverage this existing program to increase voluntary participation in this measure and other energy-related measures. Energy Upgrade California is supported by an alliance of the California Public Utilities Commission, the California Energy Commission, utility companies, regional energy networks, local governments, businesses, and nonprofits to help communities meet state and local energy and climate action goals. Funding comes from investor-owned utility customers under the auspices of the California Public Utilities Commission.

As an extension of this program, Energy Upgrade California – Home Upgrade provides assistance and incentives for home improvement projects that can reduce energy use and make homes more comfortable. Within the Bay Area, this particular program is managed by the Bay Area Regional Energy Network (BayREN), one of two regional energy networks in California. BayREN is made up of public agencies representing all nine counties within the Bay Area, and draws on the experience and expertise of Bay Area local governments. Suisun City has taken a regional leadership role as the Solano County lead for BayREN, through which the city coordinates distribution of program information to residents, contractors, and local governments. The BayREN program currently focuses on the residential single-family and multi-family property sector to help residents and property owners identify and implement energy-saving retrofits through technical support and financial rebates.

To further encourage participation from residential homeowners, the city will partner with the Solano Center for Business Innovation to leverage Energy Upgrade California’s educational materials and online platform that provides access to incentives, technical assistance, and qualified contractors. Typical rebates and incentives available to Solano County residents through Energy Upgrade California include PG&E’s Basic and Advanced Retrofit Packages, pool pumps and motor rebates, efficient water heaters/blankets, HVAC upgrades, furnace upgrades, and wall insulation installation. The city will also promote resources such as California Flex Alert, the Department of Energy’s (DOE) Weatherization Assistance Program for low-income households, and PG&E’s SmartEnergy Analyzer™ program, all of which link residential property owners to educational and financial resources. In addition, PG&E is working to fulfill Goal 2.2 of the CPUC *Long-Term Energy Efficiency Strategic Plan*, which states, “By 2020, 100 percent of eligible and willing customers will have received all cost-effective Low Income Energy Efficiency measures.”

Financing is critical to the success of the energy efficiency retrofit program. The city will continue to support the development of a Property Assessed Clean Energy program (see Measure E-3.2) to further promote energy efficiency retrofits. The city will also partner with local real estate professionals to inform homebuyers about the benefits of home energy audits and the availability of energy efficiency mortgages to finance installation of retrofit packages.

Action	Responsibility
A Develop and maintain a Solano County Sustainability Website with information about current energy efficiency rebates and incentives (including links to PG&E and Energy Upgrade California rebate pages) and local energy efficiency improvement case studies. Leverage Energy Upgrade California outreach and educational materials.	Sustainability Coordinator
B Provide training to Building Division counter staff regarding available sources of rebates/incentives and printed pamphlets or FAQ sheets.	Building Division; Sustainability Coordinator
C Provide targeted outreach to low-income and elderly households with information about the federal weatherization program and statewide Energy Savings Assistance Program, and how improvements can increase occupant comfort levels and reduce utility bills.	Planning Division; Sustainability Coordinator

Progress Indicators	Year
250 single-family houses install a comprehensive retrofit package; 750 single-family houses install a basic retrofit package; 40 multi-family units are upgraded with comprehensive retrofit; 100 multi-family units are upgraded with basic retrofit package; 58,000 sq ft of nonresidential area installs a comprehensive retrofit package; 166,000 sq ft of nonresidential area installs a basic retrofit package	2020
750 single-family houses install a comprehensive retrofit package; 2,300 single-family houses install a basic retrofit package; 125 multi-family units are upgraded with comprehensive retrofit; 325 multi-family units are upgraded with basic retrofit package; 166,000 sq ft of nonresidential area installs a comprehensive retrofit package; 500,000 sq ft of nonresidential area installs a basic retrofit package	2035

Measure E-1.2: Energy Efficiency Assessments

Supporting Measure – Not Quantified

Encourage voluntary energy assessments for residential and nonresidential buildings to identify cost-effective improvements.



Measure Background

The houses in Suisun City built before adoption of California’s Title 24 energy efficiency requirements are excellent candidates for energy-saving retrofits, which could be identified through energy assessments.

Building energy audits can help identify and prioritize energy efficiency improvements by providing a building-specific list of retrofit options and their cost-effectiveness. Additionally, the California Energy Commission (CEC) developed the Statewide Home Energy Rating System (HERS) program to allow comparisons of the efficiency levels between California homes. A home’s HERS rating is calculated as part of an energy audit, and informs homeowners and renters about energy efficiency much like the MPG metric allows comparisons of vehicles. This type of rating assists in estimating the relative utility costs associated with a home so that renters and buyers can factor those costs into their decision.

The city, through the Sustainability Coordinator and existing actions related to BayREN, will partner with the Solano Center for Business Innovation to develop a comprehensive outreach campaign that describes the benefit of energy assessments and available rebates, incentives, and financing options, such as PG&E’s no- or low-cost energy assessment programs for nonresidential customers and residential energy assessment rebates available through Energy Upgrade California. Residential assessments should be performed per the Whole House Energy Rating required by Energy Upgrade California. To help residents finance home energy assessments, the city should pursue grant funding to provide a partial rebate for residents that voluntarily perform energy assessments. Previous sources of funding have included Energy Efficiency Conservation Block Grants (EECBG) and the CEC.

As part of this outreach campaign, the city will identify neighborhoods with concentrations of older homes to help focus the outreach toward buildings that will receive the greatest energy savings. The city will also work with PG&E to identify large-energy users that would benefit from energy assessments and could be eligible for PG&E’s on-bill financing to install retrofit packages identified in the assessment. For these larger energy customers, PG&E offers low- or no-cost energy assessment services that include on-site analysis of energy consuming systems and customized calculations to help create a strategic plan for implementing projects. The city should also partner with local real estate professionals to help educate home buyers about the value of energy assessments at the point of sale. Realtors should also be encouraged to include a home’s HERS rating in the MLS listing.

Action	Responsibility
A Develop a comprehensive outreach campaign that describes the benefit of energy audits and available rebates, incentives, and financing options.	Solano Center for Business Innovation; Sustainability Coordinator
B Pursue grant funding to provide a partial rebate for residents and businesses that voluntarily perform energy audits.	Solano Center for Business Innovation; Sustainability Coordinator
C Identify neighborhoods with concentrations of older building stock to focus outreach campaign.	Planning Division; Sustainability Coordinator
D Work with PG&E to identify large-energy users that would benefit from energy audits. Leverage PG&E's on-bill financing option for nonresidential and municipal customers.	Planning Division; Sustainability Coordinator
E Partner with real estate professional groups to help educate home buyers and business owners about the benefits of energy audits at the point of sale.	Solano Center for Business Innovation; Sustainability Coordinator
F Provide links on the city website to PG&E's do-it-yourself online energy audit program. (This information could be placed on a new Solano County Sustainability Webpage to leverage regional efforts.)	Planning Division; Sustainability Coordinator

E-2: New Construction

Measure E-2.1: New Construction Energy Efficiency

2020 GHG Reduction Potential: **25 MT CO₂e/yr**

2035 GHG Reduction Potential: *Included in Statewide Reduction Zero Net Energy Building Goal*

Encourage energy-efficient new construction through promotion of energy-efficient mortgages and technical assistance programs for developers.



Measure Background

California Building Energy Efficiency Standards (Title 24, Part 6, 2008) serve as the basis for mandatory building energy efficiency standards. The California Green Building Standards Code (CALGreen), effective in 2011, also provides the city with the option of adopting an energy efficiency standard that surpasses the State's basic requirements. CALGreen outlines two options: Tier I requires a building's energy performance to exceed Title 24 requirements by 15 percent, while Tier II increases this standard to 30 percent. Revisions to the Title 24 Standards will be adopted in 2013 and will go into effect in 2015.

Although a mandatory ordinance to exceed Title 24 Standards through adoption of the Tier I or II standards will not be established at this time, the city will promote energy efficient new construction through its technical assistance program that provides local builders with information on green building practices, specifically those which relate to energy- and water-efficient design and construction practices. PG&E also developed the Savings by Design program to encourage energy-efficient construction in new commercial buildings. The program offers a range of services to building owners and their design teams, such as design assistance, design team incentives, owner incentives, and educational resources for customized new construction projects that exceed California's Title 24 energy efficiency standards.

To further encourage new construction to participate in this program, the city will provide several green-building incentives described throughout this CAP, such as permit streamlining for installation of various technologies. The city will also consider developing a local green building recognition program to commend building owners that voluntarily exceed Title 24 Standards. The city will work with local real estate professional groups and area developers to provide information to home buyers about the benefits of energy efficiency mortgages, which allow homebuyers to finance the installation of energy efficient systems, such as solar photovoltaics or high-efficiency windows.

Action	Responsibility
A Provide expedited plan-check for energy-efficient new commercial construction projects; define "energy-efficient" for plan-check purposes.	Building Division
B Partner with local developers and realtors to distribute informational brochures about energy efficient mortgages to potential new home buyers.	Building Division; Sustainability Coordinator
C Provide outreach to local developers, architects, and builders on PG&E's Savings by Design program.	Building Division
D Consider establishing a local green-building recognition award for exemplary projects.	Building Division; Sustainability Coordinator
Progress Indicators	Year
25 new single-family residential buildings exceed 2008 Title-24 by 30%	2020

Measure E-2.2: Solar Ready Construction

Supporting Measure – Not Quantified

Encourage builders to incorporate solar-ready design into new construction, including building orientation for maximum solar exposure, pre-wiring and pre-plumbing for solar PV and solar hot water, and roof system construction that can handle additional loads of future solar installations.



Measure Background

Increasing the use of distributed renewable energy systems (e.g., rooftop solar photovoltaic) prevents the combustion of fossil fuels to generate electricity, thereby reducing GHG emissions. Suisun City's location and geography result in a high solar insolation rating, which makes it an excellent candidate for effective adoption of solar technologies. The city can facilitate future installation of solar technologies by encouraging new construction to be oriented for maximum solar access, pre-wired and pre-plumbed to support PV systems and solar hot water systems, and constructed to support roof loads of solar installations. These front-end additions can reduce the cost of post-construction solar installations for homeowners. The city's technical assistance program described in Measure E-2.1 will provide information on solar-ready construction techniques.

Action

Responsibility

A	Promote the city's technical assistance program for developers to help implement this measure (see Measure E-2.1).	Building Division
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Measure E-2.3: CAP Project Compliance Checklist

Supporting Measure – Not Quantified

Clearly state the city's sustainability requirements for new entitlements in a checklist for use by production builders and developers to demonstrate compliance with the CAP.



Measure Background

One barrier to land development can be a lack of transparency or clear understanding of how to comply with various planning documents. The city will create a CAP compliance

checklist to remove uncertainty for developers. The checklist will include features that could be incorporated into a plan prior to entitlement. The city could either identify mandatory features for inclusion that would guarantee entitlement, or could develop a point-based checklist that rates each feature relative to its GHG reduction potential and set a minimum score for entitlement. Checklist items could address a variety of topic areas, including community design and layout, building features, landscaping, and public infrastructure. The checklist should refer builders and developers to the city’s technical assistance program for additional information on green design. The city should also meet with local production builders to discuss the city’s GHG emissions targets and explain how to use the new checklist.

Action	Responsibility
A Develop a checklist of new construction requirements per the CAP's measure list. Identify additional, nonmandatory building and design aspects the city would like to encourage.	Planning Division; Building Division
B Consider developing a point-based checklist system whereby a project would receive expedited permitting if it achieved a certain score.	Planning Division; Building Division
C Facilitate group meeting with production builders to discuss GHG emissions targets.	Planning Division; Building Division

E-3: Financing

Measure E-3.1: Energy Efficiency Rebate Program

Supporting Measure – Not Quantified

Consider establishing a city or county rebate program to encourage implementation of energy efficiency retrofits.



Measure Background

PG&E currently offers rebates for various home energy efficiency improvements. In addition to PG&E rebates, numerous programs funded by state agencies and local governments are available to Solano County residents through the Energy Upgrade California program (including the BayREN programs). The city will partner with other Solano County governments and agencies to identify gaps in existing rebate and incentive programs and jointly pursue funding to establish a local (e.g., Solano County) rebate program.

New rebates could be structured to encourage residents to buy goods or services from local businesses. For example, the city could develop an ENERGY STAR-rated appliance rebate program to supplement those currently offered through PG&E, by providing an additional \$50 rebate for appliances purchased from local vendors. Alternatively, the

new rebate program could be structured to address the building improvement needs of a specific building type, such as small commercial properties or multi-family residential buildings.

Action	Responsibility
A Identify rebate/incentive gaps in PG&E- and Energy Upgrade California-sponsored programs to identify local financing needs.	Planning Division; Sustainability Coordinator
B Identify an outside funding source to finance rebate program (e.g., EECBG, ARRA).	Planning Division; Sustainability Coordinator

Measure E-3.2: PACE Financing Program

Supporting Measure – Not Quantified

Partner with the county in its pursuit to establish the Clean Energy Solano PACE program that would provide financing options for residential and nonresidential energy efficiency upgrades to existing buildings. Work with other Solano County jurisdictions to jointly pursue bond funding for a commercial PACE program through California FIRST.



Measure Background

A property-assessed clean energy (PACE) finance program is enabled through the AB 811 legislation. This bill allows land-secured loans for homeowners and businesses who install energy efficiency projects and clean-energy generation systems. Senate Bill 555 reinforced implementation opportunities for PACE programs by expanding the scope of activities allowed within a community facilities district, as defined by the Mello-Roos Community Facilities Act of 1982. A PACE program permits property owners within participating districts to finance the installation of energy- and water-efficiency improvements in their home or business through a lien against their property that is repaid through their property tax bill. If the property is sold, payment responsibility transfers to the new owners, allowing building owners to avoid up-front installation costs while at the same time requiring little or no investment of local government general funds. In some instances, the new lender may require repayment of the existing lien, in which case the remaining PACE loan is repaid from the proceeds of the property sale.

Suisun City is a participating member of the California FIRST program which allows PACE funding for commercial and multi-family residential projects. Suisun City would also be within the boundaries of the proposed Clean Energy Solano PACE program, which would make financing available to both residential and nonresidential projects.

An initial market analysis for the proposed Clean Energy Solano program estimated 3.5% participation in the first five years from both the residential and nonresidential sectors, which would lead to local economic benefits including approximately \$19 million in state and local tax revenue, the creation of 2,700 new jobs, and the generation of

37 MW of local renewable energy. Furthermore, building owners who participate in the PACE program are not required to front the initial capital costs.

Action	Responsibility
A Opt into the county's PACE program as a participating member.	Planning Division; Sustainability Coordinator; Solano EDC
B Develop an outreach program describing available PACE financing options. Work with PG&E to identify large energy users to help focus outreach efforts.	Planning Division; Sustainability Coordinator
C Continue to participate in California FIRST to make PACE financing available to commercial, industrial, multi-family residential (5+ units), and nonprofit-owned buildings.	Planning Division; Sustainability Coordinator

E-4: Building Appliances

Measure E-4.1: ENERGY STAR Appliances

2020 GHG Reduction Potential: **57 MT CO₂e/yr**

2035 GHG Reduction Potential: **127 MT CO₂e/yr**

Promote voluntary installation of ENERGY STAR and other high-efficiency appliances.



Measure Background

As Title 24 Standards require building shells and systems to become even more efficient, energy consumption from appliances and electronics will become an increasingly important source for reducing building energy use and residents' utility bills. In 2009, approximately 28% of statewide residential electricity use was dedicated to appliances. Televisions, computers, and home office equipment accounted for an additional 20% of electricity use.^{iv} As big-screen televisions, smart phones, tablets, and other electricity-consuming devices become more commonplace in homes, their proportional share of home electricity use will likely increase as well. Installing ENERGY STAR appliances is one way to reduce energy use in this sector.

This measure is designed to encourage voluntary community participation to upgrade home appliances and lighting to ENERGY STAR or other energy efficient models. Successful implementation of this measure relies on leveraging the Energy Upgrade California program materials through a public outreach campaign to increase community awareness regarding energy efficient appliance choices. The ENERGY STAR rating is an internationally recognized standard for energy efficient consumer products. According to the EPA, devices that have an ENERGY STAR certification, such as office equipment, home appliances, and lighting products, generally use 20 to 30 percent less energy than required by federal standards. By promoting ENERGY STAR-rated home and

business appliances, the city can help to reduce GHG emissions related to the use of lighting, refrigerators, dishwashers, clothes washers, wall air conditioning units, computers, photocopiers, lights, and other appliances.

Through Energy Upgrade California, PG&E currently offers rebates to customers who purchase ENERGY STAR dishwashers, clothes washers, refrigerators/freezers, ceiling fans, pool pumps, and room air conditioners. The city will partner with PG&E, Solano County Water District, local developers, and other relevant organizations to promote existing financial incentives and rebates for energy-efficient appliance upgrades and replacements.

Action	Responsibility
A Collaborate with PG&E, Solano County Water District, and other local organizations to promote existing financial incentive programs to encourage voluntary replacement of inefficient appliances with new ENERGY STAR appliances.	Planning Division; Sustainability Coordinator
B Provide outreach to local developers regarding sources of available rebates to encourage installation of ENERGY STAR-rated major appliances in new residential construction.	Building Division; Sustainability Coordinator

Progress Indicators	Year
New residential construction installs energy-efficient appliances: 475 refrigerators; 625 clothes washers; 725 dishwashers; Existing residential units replace expired appliances with energy-efficient appliances: 2,300 refrigerators; 4,000 clothes washers; 6,000 dishwashers	2020
New residential construction installs energy-efficient appliances: 750 refrigerators; 1,000 clothes washers; 1,150 dishwashers; Existing residential units replace expired appliances with energy-efficient appliances: 4,000 refrigerators; 6,100 clothes washers; 7,750 dishwashers	2035

Measure E-4.2: Smart Grid

2020 GHG Reduction Potential: **219 MT CO₂e/yr**

2035 GHG Reduction Potential: **566 MT CO₂e/yr**

Encourage adoption of smart grid-compatible appliances and energy management systems to shift peak-load energy use.



Measure Background

The 'smart grid' is an emerging energy management system which uses information technology to significantly improve how electricity is managed and controlled. Smart meters, which use a technology that enables users to take full advantage of the smart grid, will eventually provide utility customers with access to detailed energy use and cost information, new time-of-use pricing programs based on peak-energy demand, and

the ability to program home appliances and devices to respond to energy use preferences based on cost, comfort, and convenience.

Current smart meters allow for frequent remote reading of energy usage by PG&E. However, the true value of the smart meter program will be fully realized when community residents and businesses begin making more informed energy use decisions based on the two-way communication enabled by smart meters, such as when a homeowner is able to program their washing machine to run when energy prices are lowest.

All investor-owned utilities are rolling out time-of-use pricing, which offers lower utility rates to customers that switch discretionary energy use to off-peak times. Time-of-use pricing is mandatory for all commercial customers, and will eventually be offered to residential customers as well. PG&E currently offers the SmartRate pricing plan to residential customers, which offers lower prices per kWh to customers that agree to reduce electricity use on “SmartDays” when intense heat drives up air conditioning use and therefore, electricity prices. PG&E has also joined OPower, a social media technology provider that helps customers using smart grid technology to compare their energy use with neighbors. To support use of their various pricing programs, PG&E created the Green Button Connect program to allow customers to share their energy usage data with third-party app developers that already have products to help customers track and manage their energy use. The assumption is that customer access to their own energy use trends will support behavioral changes to energy consumption, which will lower customers’ utility bills and lower PG&E’s costs to provide energy.

When estimating the potential GHG emission reductions associated with implementation of the smart grid, the city included the energy efficiency improvements gained from integrating smart grid energy management systems for control lighting, heating, ventilation, and air conditioning and other major appliances in residential and commercial buildings. According to CISCO, a world-wide leader in network technology, full integration of the smart grid will take time to realize, but energy analysts estimate it will ultimately be capable of reducing electricity-related GHG emissions by 30 percent below current levels.

Through public outreach efforts and targeted outreach to the development community, the city will encourage voluntary adoption of smart-grid technology for homes and businesses. The Sustainability Coordinator will train Building Division staff on the benefits of smart-grid integration and provide informational materials on existing rebate programs.

Action	Responsibility
A Develop an outreach program that leverages existing PG&E materials, including description of the O-Power Program. Make information available at Building Division counter.	Building Division; Sustainability Coordinator
B Identify and advertise available rebates for smart-grid compatible appliances and systems on the county’s Sustainability Website.	Building Division; Sustainability Coordinator

Progress Indicators	Year
1,150 residential units install smart-grid compatible appliances and systems; 215,000 sq ft of commercial area installs smart-grid compatible appliances and systems	2020
4,050 residential units install smart-grid compatible appliances and systems; 1.7 million sq ft of commercial area installs smart-grid compatible appliances and systems	2035

Measure E-4.3: Permanent Load Shift

Supporting Measure – Not Quantified

Encourage participation in PG&E's Permanent Load Shift program to shift thermal cooling loads to off-peak and/or partial-peak hours.



Measure Background

PG&E's Permanent Load Shift program, often referred to as "Shift & Save," is to store thermal cooling capacity during off-peak hours and/or partial-peak hours in order to meet thermal cooling load in subsequent on-peak hours. The goal of this program is to shift 3.9 megawatts of load. The program's targeted customers are bundled service, commercial, industrial, agricultural, and large residential customers in PG&E's electric service territory. PG&E is working with Cypress Ltd. and Trane USA to implement this program.

The city will partner with PG&E to identify and provide outreach to local large-energy users that could financially benefit from participation in the program. The city will partner with the Solano Center for Business Innovation and the Solano Economic Development Corporation in its outreach activities to find regional efficiencies in program expansion and application in other Solano County cities. A statewide Permanent Load Shift technology incentive program is currently under development; the city should monitor its progress to identify opportunities for local application.

Action	Responsibility
A Work with PG&E to identify large-energy users that would benefit from peak-load shifting technologies and/or strategies. Targeted customers are bundled service, commercial, industrial, agricultural, and large residential customers.	Building Division; Sustainability Coordinator
B Monitor development of the statewide Permanent Load Shift program to identify opportunities for local application.	Building Division; Sustainability Coordinator

E-5: Building Cooling

Measure E-5.1: Building Shade Trees

2020 GHG Reduction Potential: **86 MT CO₂e/yr**

2035 GHG Reduction Potential: **173 MT CO₂e/yr**

Adopt a shade tree ordinance for new construction and develop a shade tree outreach campaign to encourage existing property owners to voluntarily plant shade trees.



Measure Background

Properly located trees can provide shading for residential and commercial buildings, and thereby reduce the need for air conditioning. The capacity of a tree to reduce GHG emissions is dependent on its age and species. As trees mature, their canopies increase in size and provide higher levels of shade and greater levels of building cooling in hot weather. Large, deciduous species are ideal for reducing building energy use as they provide shade in summer, but allow winter sunlight into buildings for passive solar gain in cooler weather. Additionally, trees gain carbon-capturing biomass in their trunks and roots as they absorb carbon from the air to grow.

The city will consider adopting a shade tree ordinance requiring new construction to plant trees to beneficially shade air conditioned buildings. The ordinance will allow the installation of building-integrated vegetation in lieu of shade trees. The city will also work with local organizations to promote voluntary shade tree planting at existing buildings. To facilitate proper implementation of this measure, the city will develop a shade tree planting guide to instruct home builders, developers, landscapers, building managers, and property owners on proper shade tree selection and placement to maximize building cooling opportunities while preserving solar access on the roof. Planting guidance should describe the selection of climate-appropriate species and proper siting specifications (i.e., S, SW, or W side of buildings; no more than 20' from the building).

Action	Responsibility
A Amend the city's Development Standards per the new shade tree ordinance.	Planning Division
B Work with local environmental and conservation groups to advertise the various benefits of planting shade trees near existing buildings.	Building Division
C Develop a shade tree planting guide to facilitate proper tree selection and installation.	Building Division; Public Works

Progress Indicators	Year
4,750 new shade trees properly installed (does not include replacement trees for existing shade trees)	2020
9,500 new shade trees properly installed (does not include replacement trees for existing shade trees)	2035

Measure E-5.2: Parking Lot Shade Trees

Supporting Measure – Not Quantified

Develop a parking lot shade ordinance to reduce the urban heat island effect.



Measure Background

Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, and heat-related illness and mortality. A primary contributor to urban heat islands is unshaded asphalt pavement, including streets and parking lots. These types of surfaces absorb heat from the sun during the day and radiate that heat back to the surrounding environment throughout the day and into the night, raising local air temperatures.

The city will consider replacing its current parking lot landscaping requirements with a parking lot shade ordinance that requires shade tree or shade structure installation at multi-family and commercial properties such that 50% of the parking lot is shaded within 10 years.

Action	Responsibility
A Adopt a parking lot shade ordinance requiring shade tree or shade structure installation at multi-family and commercial properties; establish threshold for minimum percentage of the parking lot that will be shaded within 10 years.	Planning Division

E-6: Building Lighting

Measure E-6.1: Indoor Lighting Efficiency

2020 and 2035 GHG Reduction Potential: See *Statewide Reduction AB 1109*

Encourage voluntary adoption of efficient indoor and outdoor lighting technologies in residential and nonresidential buildings.



Measure Background

According to the 2009 California Residential Appliance Saturation Study, approximately 20% of residential electricity consumption is attributed to lighting.^v In nonresidential buildings, conventional commercial lighting, including T12 fluorescent bulbs and old exit sign lights, consume more energy than new T8 lights and light-emitting diode (LED) technologies. Lighting upgrades typically provide a short payback period for their investment, and are a good source of GHG emissions reductions.

The Sustainability Coordinator will provide outreach and technical assistance to nonresidential property owners to encourage participation in PG&E's lighting upgrade program, which includes rebates for fixtures, lamps, accent/directional lighting, controls, and signage. The city will also provide outreach to multi-family property managers regarding lighting rebates through PG&E, including CFL replacement bulbs, activity sensors and timers, and replacing T-12 lamps with magnetic ballasts. Informational materials should demonstrate the simple-payback period associated with lighting improvements (typically 2-4 years). The city will also advertise PG&E's CFL rebate, or other lighting rebate programs, on the new sustainability website.

Action	Responsibility
<p>A Develop lighting-efficiency informational materials that demonstrate the simple-payback period associated with lighting improvements and existing rebates. Post information on the Solano County Sustainability Webpage. Provided targeted outreach to large nonresidential building managers and multi-family property managers.</p>	<p>Building Division; Sustainability Coordinator</p>
<p>B Leverage existing energy-efficient lighting rebate programs offered through Energy Upgrade California, including fixture and lamp replacements/installation, accent and directional lighting, security lighting, lighting control systems, and PG&E's residential CFL rebate program.</p>	<p>Solano Center for Business Innovation; Sustainability Coordinator</p>
<p>C Encourage small businesses to participate in PG&E programs that provide technical assistance and access to incentives for energy efficiency upgrades (e.g., lighting).</p>	<p>Solano EDC</p>

E-7: Renewable Energy

Measure E-7.1: Solar Photovoltaic Systems

2020 GHG Reduction Potential: **1,779 MT CO₂e/yr**

2035 GHG Reduction Potential: **1,687 MT CO₂e/yr**

Facilitate the voluntary installation of solar PV systems on residential and nonresidential buildings.



Measure Background

Solar photovoltaic (PV) systems generate electrical power by converting solar radiation into direct current electricity using semiconductors. PV power generation employs solar panels composed of cells containing photovoltaic material. PV systems can be retrofitted into existing buildings, usually by mounting them on an existing roof structure or walls. Suisun City's solar potential is approximately 5.1 kWh/m²/yr, which is sufficient to support a solar PV installation that would cover a large percentage of an average home's electricity demand.^{vi} In addition to residential rooftops, commercial and industrial rooftops tend to have large, flat roofs that are often well-suited for solar photovoltaic (PV). Parking lots also provide excellent opportunities for additional solar energy generation. According to PG&E data, Suisun City contains nearly 50 residential solar PV systems installed since 2005, with a total capacity of approximately 250 kW. The city also contains nonresidential solar PV systems totaling an additional 900 kW.^{vii} However, numerous barriers may prevent widespread adoption of solar PV technology, including city regulations, up-front costs, misinformation or lack of information.

Financing is critical to the success of the solar PV program. Property owners will be able to finance their PV systems through various financing programs and rebates. As described in Measure E-3.2, the city will support the development of and participation in two PACE programs to further promote renewable energy systems for residential and nonresidential buildings. Other financing models, such as power purchase agreements (PPAs), can be used to offset the initial capital cost of installing a solar PV system. Solar PV rebates are available through the California Solar Initiative and its related programs: New Solar Homes Partnerships, Multifamily Affordable Solar Housing Program, and Single-Family Affordable Solar Housing Program. Rebate amounts vary, and are typically based on the installed system size and expected performance. Some rebate programs have variable rebate steps, which decline as PV installed capacity increases.

The city will develop a comprehensive solar PV program that encourages homeowners to install PV systems through outreach advertising available rebate and incentive programs. Outreach efforts will aim to maximize community participation from homeowners, builders, and businesses by leveraging existing educational materials and links to technical assistance and rebates and financing programs. The city will encourage homeowners to request free solar PV assessments provided by private solar financing and installation companies. The city will also consider reviewing and revising its zoning

and building codes and other applicable ordinances to identify and remove regulatory barriers to solar installations (i.e., PV and solar hot water) on residential and nonresidential properties. The city will consider offering priority permitting for new solar PV systems to further reduce implementation barriers.

Action	Responsibility
A Review/revise all applicable building, zoning, and other codes and ordinances to identify and remove potential regulatory barriers to the installation of solar PV or solar hot water systems in residential and nonresidential construction.	Building Division
B Provide priority permitting for building-scale renewable energy projects.	Building Division; Sustainability Coordinator
C Develop a comprehensive outreach campaign to increase voluntary participation in solar PV installation programs, including a directory of existing rebates/incentive programs, explanation of simple-payback calculations for solar PV systems, and technical assistance. Leverage existing solar PV informational materials from Energy Upgrade California, the California Solar Initiative, and PG&E.	Building Division; Sustainability Coordinator
D Develop informational materials about the benefits of PPAs offered through independent solar service providers. Post on the Solano County Sustainability Website, and make printed copies available at the Planning Department and Building Division counters.	Building Division; Sustainability Coordinator

Progress Indicators	Year
625 single-family units install 4.5kW PV system 2.0 MW capacity installed on nonresidential and multi-family buildings	2020
800 single-family units install 4.5kW PV system 3.8 MW capacity installed on nonresidential and multi-family buildings	2035

Measure E-7.2: Solar Water Heaters

2020 GHG Reduction Potential: **77 MT CO₂e/yr**

2035 GHG Reduction Potential: **433 MT CO₂e/yr**

Promote voluntary installation of solar water heaters in new construction and building retrofits through outreach campaign.



Measure Background

The effectiveness of a solar installation is described, in part, by its solar savings fraction (solar fraction). This measurement describes the percentage of a building's total energy demand that can be met through installation of a solar energy system. A 0% solar fraction indicates that no solar energy utilization is possible, while 100% would indicate full utilization of solar energy to meet building energy demand. Dixon has a 65% solar fraction for low-rise buildings (i.e., 1-2 stories) and a 44% solar fraction for multistory structures (i.e., 3 or more stories), indicating good potential for solar water heater applications.^{viii}

Solar water heating systems are a simple, reliable, and cost-effective method for harnessing the sun's energy to provide for hot water needs. Solar collectors, usually placed on the roof, absorb the sun's energy to heat water that is stored in a water tank. The State of California has recognized the value of solar hot water heaters. The California Solar Water Heating and Efficiency Act of 2007 (AB 1470), created a 10-year program aimed at installing solar water heaters in homes and businesses. AB 1470 was designed to lower the initial costs of purchasing a system, which averages around \$3,000-\$6,000.

Solar hot water systems can also be a cost-effective replacement for inefficient water heaters. According to the California Solar Initiative (CSI), solar hot water systems can lower energy bills by meeting 50 to 80 percent of hot water needs over a year. Though the high capital cost of solar water heater upgrades can pose a financial burden to homeowners, there are a range of financing and rebate options to offset these initial investment costs.

There are a number of financing options that may be used to reduce upfront costs, such as the PACE programs mentioned in Measure E-3.2, federal tax incentives through the Energy Policy Act of 2005, and financial incentives through the CSI-Thermal Program. Similar to the CSI solar rebate programs, the CSI-Thermal Program provides rebates for solar water heaters that decline in value as installation increases.

The Solar Water Heating Pilot Program, operated through San Diego Gas and Electric from 2007-2010, identified numerous barriers to the widespread adoption of solar water heating systems. In particular, participating contractors named permitting and inspection costs and delays as a primary obstacle to widespread adoption for single-family residential buildings because non-material costs represented approximately 65% of total system costs. That means, only 35% of total costs were related to the actual system price. To help address this problem, the city will work to streamline the solar water heater permitting process.

The city will also work with PG&E to create outreach opportunities that provide information about the financial benefits of solar hot water heaters, describe existing financing options and rebate programs, and explain the city's efforts to encourage participation.

Action	Responsibility
A Collaborate with PG&E and the California Solar Initiative - Thermal Program to develop an outreach program to maximize installation of solar hot water systems and leverage existing funding opportunities.	Planning Sustainability Coordinator
B Streamline permitting process (e.g., building, electric, plumbing) for solar hot water system installation.	Building Division

Progress Indicators	Year
85 single-family residential units install solar hot water system; 15 multi-family units are served by solar hot water system;	2020
450 single-family residential units install solar hot water system; 75 multi-family units are served by solar hot water system	2035

Measure E-7.3: Community Choice Aggregation

2035 GHG Reduction Potential: See *Progress towards 2035 Target* discussion at end of chapter

Consider supporting the County in its efforts to develop a community choice aggregation program to provide Solano County residents with a choice in their energy provider.



Measure Background

Solano County included a measure in its CAP to investigate the potential for a countywide community choice aggregation program (CCA). Assembly Bill 117, which was signed into law in 2002, enables California cities and counties, either individually or collectively, to supply electricity to customers within their borders through the establishment of a CCA. Unlike a municipal utility, a CCA does not own the transmission and delivery systems, but is responsible for providing electricity to its constituent residents and businesses. The CCA may own electric generating facilities, but more often, it purchases electricity from private electricity generators.

A key benefit of a CCA is that the participating jurisdictions can determine the amount of renewable energy contained within the generation portfolio. For example, a Solano County CCA could decide to provide 50% of its electricity from renewable sources, which would exceed State requirements directing California's utilities to provide 33% of their electricity from renewable sources by 2020.

Developing a CCA will require a detailed analysis of energy demand, efficiency opportunities, and renewable generation opportunities in Solano County. Using existing models from other counties (e.g., Marin County) is likely to reduce the initial program design costs. The program would be most effective if the city partnered with other Solano County cities and the county government to jointly pursue a CCA program.

Suisun City will consider working with the county and other interested participants in the preparation of feasibility studies, outreach campaigns, and other efforts to develop a countywide CCA. No quantification reductions have been estimated for the 2020 target year because it is unlikely a new Solano County CCA could be studied, developed, approved, and marketed before then. However, an estimate of the future potential reductions associated with a CCA developed prior to the 2035 target year are described in the *Progress toward 2035 Target* discussion at the end of this chapter for informational purposes only.

Action	Responsibility
A Work with the county to prepare necessary study reports, informational materials, and any other supporting research and/or documents to help pursue a CCA program.	Sustainability Coordinator

E-8: Street and Area Lighting

Measure E-8.1: Street Light Upgrade

2020 GHG Reduction Potential: **59 MT CO₂e/yr**

2035 GHG Reduction Potential: **59 MT CO₂e/yr**

Partner with PG&E to upgrade existing street lights to LED, induction, or other energy-efficient technology. Require new street lights to use energy-efficient technology.



Measure Background

Streetlights account for approximately 35% of the city's municipal electricity use.^{ix} High-pressure sodium bulbs, commonly used in streetlights, require more energy and have a shorter lifespan than new induction and/or light-emitting diode (LED) lights. The short simple-payback period associated with lighting upgrades makes this an easy measure to implement.

The city has developed a pilot program to upgrade streetlights to LED, similar to programs underway in the Cities of Dixon and Fairfield. The city will explore funding options through PG&E and the California Energy Commission to upgrade streetlights citywide. The city will also update its streetlight standards to require energy-efficient streetlights for new and replacement installations.

Action		Responsibility
A	Develop a street light upgrade program that identifies funding sources and an implementation phasing schedule.	Public Works
B	Revise the city's street lights standards to include requirements for energy-efficient technology in new and replacement lamps.	Public Works

Progress Indicators	Year
100% of HPS bulbs are replaced with energy-efficient technology	2020 and 2035

Measure E-8.2: Traffic Signal Upgrade

2020 GHG Reduction Potential: **2 MT CO₂e/yr**

2035 GHG Reduction Potential: **2 MT CO₂e/yr**

Develop a traffic signal upgrade pilot program to test available energy-efficient lighting technologies.



Measure Background

The city will develop a pilot program to replace the incandescent bulbs in traffic signals with LED bulbs. The city will consult with the Cities of Dixon and Fairfield on their traffic signal upgrade programs to identify best practices in technologies and financing options. Following a successful pilot program, the city will upgrade all traffic signals citywide with energy-efficient technology.

Action		Responsibility
A	Consult with the Cities of Dixon and Fairfield regarding their traffic light upgrade programs for best management practice ideas.	Public Works
B	Implement pilot program at selected intersections to test results of available technology. Expand program citywide following pilot program.	Public Works

Progress Indicators	Year
100% of incandescent bulbs in traffic signals are replaced with energy-efficient technology	2020 and 2035

Measure E-8.3: Parking Lot Lighting Upgrade

2020 GHG Reduction Potential: **22 MT CO₂e/yr**

2035 GHG Reduction Potential: **90 MT CO₂e/yr**

Consider additional parking lot lighting upgrade projects in the future.

Measure Background

High-quality parking lot lighting is necessary to provide personal safety and deter theft and vandalism. However, conventional parking lot lighting, including high-wattage metal halide and high-pressure sodium lights, consumes more energy than new light-emitting diode (LED) technologies, which provide comparable lighting quality at a fraction of the energy consumption.

The city will build upon its previous experience in parking lot lighting upgrades at municipal parking lots, and explore opportunities for additional upgrade projects. To finance future projects, the city could contract with an Energy Service Company (ESCO) to perform parking lot lighting energy audits and identify best available retrofit improvements. In most cases, the ESCO pays up-front costs associated with retrofit installation, further reducing financial risk to the city.

The city will also work with the Solano Center for Business Innovation to provide outreach to local businesses about the simple-payback period associated with parking lot lighting upgrades. Informational materials could include financial characteristics of the city’s previously installed upgrades and potential resources for financing or rebates. PG&E’s *Lighting Rebate Catalog* provides a comprehensive source for exterior lighting rebates, including fixtures and bulbs.

Action	Responsibility
A Build upon the city's experience with their first parking lot lighting upgrade.	Public Works

Progress Indicators	Year
10% of parking lot lights are upgraded from HPS to energy-efficient technology	2020
25% of parking lot lights are upgraded from HPS to energy-efficient technology	2035

E-9: Municipal Actions

Measure E-9.1: Municipal Building Energy Efficiency

2020 GHG Reduction Potential: **32 MT CO₂e/yr**

2035 GHG Reduction Potential: **39 MT CO₂e/yr**

Establish a goal to reduce business-as-usual electricity use in municipal buildings by 15%.



Measure Background

Reducing municipal energy use will reduce communitywide GHG emissions, save taxpayer dollars, and set an example for the successful implementation of energy-saving technology.

The city has already completed building energy audits to identify future potential for energy efficiency improvements. As described throughout this chapter, numerous financing options and rebate programs are available to fund energy-efficiency improvements. The city could also explore energy saving performance contracts to finance improvements. Under this type of agreement, an Energy Services Company (ESCO) completes building energy audits to identify the most cost-effective retrofit options. The ESCO guarantees the amount of energy that will be saved under a defined retrofit package, and further guarantees that the value of energy savings would be sufficient to cover efficiency upgrade costs as long as the price of energy does not fall below a stipulated floor price. In most cases, the ESCO pays up-front costs associated with retrofit installation, further reducing financial risk to the city.

In addition to addressing building performance, the city could provide information and training to city employees on how to reduce energy consumption in the workplace. The city could conduct one campaign per year, ideally during National Energy Awareness Month in October, to educate employees about their energy consumption at work and ways to reduce consumption (e.g., turning off computers and monitors, turning off lights, using power strips). To incentivize participation, the city could consider advertising energy consumption trends during the campaign period and provide prizes for quantifiable reductions.

Action	Responsibility
A Perform energy audits on select city buildings to identify future potential for energy efficiency improvements.	Building Division; Public Works
B Consider hiring an ESCO to implement findings from previously completed building energy audits.	Public Works
C Conduct city employee energy use reduction campaign and incentivize participation.	Public Works; Sustainability Coordinator

Progress Indicators	Year
Municipal building energy use is reduced by 240,000 kWh/yr from 2005 business-as-usual projections	2020
Municipal building energy use is reduced by 300,000 kWh/yr from 2005 business-as-usual projections	2035

Measure E-9.2: Wastewater Treatment Plant Process Optimization

2020 GHG Reduction Potential: **171 MT CO₂e/yr**

2035 GHG Reduction Potential: **171 MT CO₂e/yr**

Continue to perform energy optimization audits at FSSD and implement audit results.



Measure Background

PG&E performs Integrated Energy Audits of wastewater treatment facilities to identify the most critical efficiency improvements and help sewer districts to select energy-saving projects and identify available financial incentives. PG&E helped the Fairfield Suisun Sewer District (FSSD) to save 1.3 million kWh/yr and install wind turbines with a 200 kW capacity. FSSD received \$350,000 in incentives from PG&E, contributing to a simple-payback of 2.7 years for its energy efficiency projects.^x FSSD now budgets for regular energy audits to ensure their facility is operating efficiently.

Action	Responsibility
A Continue to budget for regular Integrated Energy Audits on wastewater treatment plant operations.	FSSD

Progress Indicators	Year
Reduce energy use at FSSD by 1.3 million kWh from 2005 business-as-usual	2020 and 2035

Transportation + Land Use Strategy

Transportation-related emissions make up approximately 51% of the communitywide 2005 emissions inventory. Vehicle fuel efficiency, fuel carbon content, and vehicle operations, all influence the amount of transportation emissions generated in a community. However, these emissions are largely generated by the number of vehicle miles traveled (VMT) by residents and employees. Long vehicle trips and high numbers of trips create higher emissions.

While state-mandated technological changes in fuel efficiency and reductions in fuel carbon content will help reduce transportation emissions, significant reductions will require local action. Eliminating or shortening vehicle trips is made possible through increasing alternative transportation options, such as transit, bicycling, or walking, and through the distribution of diverse land uses relative to transportation options.

The transportation and land use strategy includes efforts to improve pedestrian mobility to encourage walking between nearby destinations and accommodate non-automotive circulation. Enhancing the bicycling network and improving access to transit stops also support alternative transportation options.

Where people live, work, shop, and play also determines how far they have to travel daily, and whether they choose to walk, bike, use public transit, or drive. Measures that support mixed land uses and opportunities for higher-density development along existing transit routes are essential to supporting alternative transportation options.

Facilitating a transition to alternative fueled vehicles and managing daily traffic demand can also reduce emissions. This includes incorporating alternative fueled vehicles in the municipal fleet, providing charging and refueling stations for alternative fueled vehicles communitywide, and assisting local businesses with automobile travel reduction efforts.

Emissions reductions from the transportation and land use strategy total 882 MT CO₂e/yr in 2020. This represents approximately 3% of total CAP measure reductions. While local transportation reduction estimates may appear low as compared to the proportion of transportation emissions in the city's baseline inventory, it should be noted that statewide actions addressing transportation emissions account for nearly 51% of total emissions estimated in this CAP. Many of the transportation measures included here support higher quality-of-life indicators, such as walkable communities, improved local air quality, and reduced traffic congestion.

T-1: Pedestrians + Bicycles

Measure T-1.1: Pedestrian Environment Enhancements

Supporting Measure – Not Quantified

Continue to plan for safe, attractive pedestrian environments that encourage walking between nearby destinations.



Measure Background

Pedestrian enhancements encourage walking, potentially increasing foot traffic to local retail establishments and businesses, while decreasing automobile trips and emissions. Pedestrian enhancements include the provision of seating, shading, way-finding signs, safe crosswalks, and traffic calming measures. Providing connectivity and convenient, enjoyable pedestrian areas also improves residents’ quality of life.

The city recently completed a bicycle and pedestrian path along the south side of SR-12 between Marina Boulevard and Grizzly Island Road. The new path compliments an existing path on the north side of the highway, and provides a safe route for school children, allowing them to avoid crossing SR-12.

Moving forward, the city will continue to work with STA on updates to the Countywide Pedestrian Master Plan, including the prioritization of projects to be implemented within Suisun City. The Countywide Plan provides a framework for local governments to identify important improvements that would increase pedestrian safety in their cities and throughout Solano County. The Countywide Plan was developed so that it could be adopted by individual cities to serve as their local Pedestrian Master Plan, thereby fulfilling a common criterion of pedestrian-improvement grant funding programs. Suisun City will either adopt the Countywide Plan or develop its own Pedestrian Master Plan. The city should also identify funding sources to help install priority projects, particularly for instances when a local match is required to qualify for grant funds.

Action	Responsibility
A Develop Pedestrian Master Plan or adopt Solano Countywide Pedestrian Plan to serve as guidance for pedestrian improvements; update plan every 3-5 years	Building & Public Works
B Prioritize implementation of pedestrian enhancements as identified in Pedestrian Master Plan	Building & Public Works
C Identify funding sources to provide city's match for project planning, design, and construction	Building & Public Works
D Implement city's complete streets policy requiring accommodations for non-automotive circulation on newly constructed roads and during major roadway improvement projects	Building & Public Works

Measure T-1.2: Bicycle Infrastructure

Supporting Measure – Not Quantified

Continue to install bicycle paths and lanes within the community to increase bicycle ridership and safety.



Measure Background

As mentioned in Measure T-1.1, the city recently completed a new multi-modal path adjacent to SR-12 for pedestrians and cyclists. Over the last decade, the city has constructed more than four miles of Class I facilities to encourage safe community cycling for recreation and alternative transportation. The city also recently approved Guiding Principles for its 2035 General Plan Update, which include providing alternative transportation choices and design for active pedestrian and bicycle-friendly paths, streets, and public spaces.

Most transportation grant-funding agencies that provide resources for bicycle infrastructure expansion require applicants to have an adopted Bicycle Master Plan to demonstrate that opportunities and constraints related to community cycling have been identified and analyzed. Similar to the Countywide Pedestrian Master Plan described above, STA also worked with Solano County jurisdictions to prepare a Countywide Bicycle Plan, which the individual cities can adopt as their own local plan.

The city will adopt the Countywide Bicycle Plan, or develop its own plan, to position itself for future grant funding related to bicycle network improvements. The city will continue to partner with STA to pursue opportunities for additional bicycle safety improvements and system expansions. The city will also identify and work to remove barriers to widespread cycling within the community as part of long-range planning projects or development of specific plans.

Action	Responsibility
A Develop a Bicycle Master Plan or adopt the Solano Countywide Bicycle Plan to serve as guidance for bicycle network improvements; update plan every 3-5 years	Building & Public Works; Planning
B Prioritize implementation of bicycle network enhancements as identified in Bicycle Master Plan	Building & Public Works
C Identify funding sources to provide city's match for project planning, design, and construction	Building & Public Works
D Identify and work to remove barriers that could inhibit cyclists from accessing various transit stations / stops	Building & Public Works; Planning

Measure T-1.3: Bicycle Outreach Program

Supporting Measure – Not Quantified

Develop a bicycle outreach program to promote communitywide "bikeability" through safety programs, bicycle tune-up clinics/training, and partnerships with bicycle advocacy groups and cycling clubs.



Measure Background

Bicycle education and outreach are important to increasing bicycle safety and ridership within the community. These programs can increase community members' comfort with cycling for exercise or running daily errands, with instruction on proper bicycle maintenance, safe cycling techniques, and an introduction to local cycling groups. STA currently provides a successful countywide Safe Routes to School program, which includes bicycle rodeos for elementary school students and a Walk N' Roll week to teach safety in walking and cycling.

The city will continue to partner with STA on implementation of the Safe Routes to School program, including efforts to evaluate efficacy of the program to determine if modifications should be made in the future. The city will also support STA in implementation of the Countywide Wayfinding Signage Program Phase II. Regional bicycle trail directional signs were installed in Phase I of this regional program. Phase II will include installation of local wayfinding signs to help riders find points of interest, such as the Suisun City waterfront, the Amtrak Station, and city parks and schools. The city can also work with local cycling clubs or advocacy groups to identify dangerous conditions that should be addressed in future updates of the Bikeways Plan.

Action	Responsibility
A Work with STA to continue its bicycle safety education activities, including bicycle rodeos and Walk-and-Roll programs at local schools	STA; Building & Public Works
B Solicit comments from local cycling clubs/advocacy groups to identify dangerous cycling conditions within city; address problem areas through Safe Routes to School (SRTS) Program	Building & Public Works
C Support STA in effort to evaluate efficacy of existing SRTS program to identify changes in pedestrian or bicycle accidents and modify future program as necessary	STA; Building & Public Works
D Support STA in adoption and implementation of Countywide Wayfinding Signage Program Phase II	STA; Building & Public Works

T-2: Public Transit

Measure T-2.1: Transit Route Stabilization

Supporting Measure – Not Quantified

Ensure maintenance of existing transit service programs before attempting to expand services.



Measure Background

Successful public transit systems shift commute trips from personal automobiles to buses, shuttles, trains, and other options. Well-designed public transit systems serve a community’s major residential, employment, and cultural centers at service intervals that allow riders to easily and predictably plan trips. Viable transit systems are dependent upon a sufficient ridership base, which often requires an average minimum population or employment density around transit stops.

Several transportation agencies operate transit routes within and through Suisun City, including FAST, Solano Express, VINE, and Soltrans. These agencies provide local transit services throughout the city, as well as connections to Sacramento, the Bay Area, and Napa County. Amtrak also provides a local connection to Sacramento and the Bay Area. The city budgets annually to maintain the train depot and its important service connection. Additionally, STA manages the Solano Napa Commuter Information website, which provides information on area vanpools and ride matching services.

Suisun City’s relatively lower-density development character makes the creation of a robust public transit system difficult. Rather than attempt to expand the geographic extent of the current FAST transit system, the city will first work with STA to ensure existing levels of service continue into the future. The city will work with STA to implement its Short-Range Transit Plan, which includes near-term strategies to stabilize the existing transit system. The city will also continue to explore opportunities through the public planning process to increase densities and intensities within certain areas of the city. Measure T-3.1 and T-3.2 address land use strategies that could help to strengthen the existing transit system, and in the long-term, provide a sufficient ridership base to allow for system expansion.

Action		Responsibility
A	Work with STA to implement findings of Short-Range Transit Plan to keep current transit systems viable	STA; Building & Public Works
B	Facilitate higher density development within designated Priority Development Areas to increase potential ridership of residents and employees along existing transit routes	Planning
C	Enhance local transit service next to high density, mixed-use development areas to take advantage of proximity to new potential transit riders	STA; Building & Public Works

T-3: Land Use

Measure T-3.1: Transit-Oriented Development

Supporting Measure – Not Quantified

Create opportunities for new high-density, mixed-use development adjacent to transit centers.



Measure Background

Transit-oriented development (TOD) places higher density and intensity development within walking distance of primary transit stops. This strategy brings residents and jobs closer to transit opportunities, providing additional ridership for the public transit system. Successful TOD can take various shapes, depending on the character of the community. TOD can focus on increasing employment near transit stops, typically within a ½-mile radius, provided adequate pedestrian connectivity is available for riders to then reach their jobs. It can also focus on increasing residential densities near transit stops, usually within a ¼-mile radius. TOD can also include a mix of uses (e.g., residential, office, retail) when the goal is to develop a more complete neighborhood center.

Community opposition to increased densities or intensities may hinder local efforts to encourage TOD. Local land use and development policies may also pose a barrier. Parking standards that ignore the potential for reduced automobile trips in TOD may inhibit development due to the high cost of providing parking.

In 2011, Suisun City applied received technical assistance through the Metropolitan Transportation Commission FOCUS grant program to formulate feasible development concepts for key catalyst sites in the city's Priority Development Area. The technical assistance enhanced the city's efforts to attract new mixed-use and residential development to the Downtown area. The city also received a One Bay Area Priority Development Area Planning Grant for its Downtown Waterfront Specific Plan, which will supplement continuing efforts to renovate the Downtown, including around the Amtrak Station.

The city will build upon these previous Downtown planning activities with a study of parking availability in the Downtown area. The city will then consider the potential future parking demand based on the General Plan Update land use designations. This study will help to determine if future development could be allowed parking reductions or exemptions without negatively affecting the neighborhood. The city will also identify potential areas for increased development density and/or intensity, and verify that adequate infrastructure exists to support that level of development.

Action	Responsibility
A Reduce off-street parking requirements for transit-oriented and mixed-use developments, for developments providing shared parking, and for developments that incorporate travel demand management measures	Planning;
B Identify areas that could support net increase in population or employment through land use changes within 1/4 mile walking distance of transit stops	Planning
C Work with Fairfield Suisun Sewer District to evaluate capacity for higher-density/intensity development in transit areas, and develop prioritization and funding strategies to complete necessary improvements	Planning
D Continue to implement aspects of Downtown/Waterfront Specific Plan that facilitate infill development and attract higher density/intensity land uses, particularly those uses that support development of non-retail oriented jobs	Building & Public Works; Planning

Measure T-3.2: Mixed-Use Development
 Supporting Measure – Not Quantified

Encourage mixed-use development through land use and zoning designations to support alternative transportation options for certain daily activities.



Measure Background

The distribution of land uses and the degree of street connectivity within a city influences how people travel. Land use strategies that place daily needs near each other and near residential neighborhoods allows some trips to be made without a car. Development patterns that provide convenient pedestrian connectivity to parks, schools, retail, and jobs also supports non-automotive transportation options. Mixed-use development often creates these pedestrian-friendly environments with a variety of uses nearby that allow people to address some or all of their daily live, work, play and shop needs in one place.

Single use zoning, as the name implies, only allows one type of land use within an area, which can result in large areas dominated by a single development type, such as single-family houses or shopping. This type of development makes use of alternative transportation options difficult because densities are often too low to support public transit and the distances between different land uses are too great to encourage walking or cycling.

In conjunction with the transit-oriented development measure described above, the city will work with residents to identify opportunities for future mixed-use development through land use and zoning changes. The same parking analysis described in Measure

T-3.1 can be used to determine if parking requirements for mixed-use development can be reduced based on shared parking opportunities that result from mixing land uses.

Action	Responsibility
A Identify opportunities to increase mixed-use development around transit centers or primary transit stops, particularly in opportunity areas with vacant and/or underutilized properties, such as adjacent to Amtrak station, Downtown, marina area, and southern end of Sunset Avenue	Planning
B Reduce off-street parking requirements for transit-oriented and mixed-use developments, for developments providing shared parking, and for developments that incorporate travel demand management measures [Same as T-3.1 Action A]	Planning

T-4: Alternative Fuels

Measure T-4.1: Alternative Fuel Vehicles

2020 GHG Reduction Potential: **747 MT CO₂e/yr**

2035 GHG Reduction Potential: See *Progress towards 2035*

Target discussion at end of chapter

Encourage communitywide use of alternative fuel vehicles through expansion of alternative vehicle refueling infrastructure.



Measure Background

Alternative-fueled vehicles use electricity, compressed natural gas (CNG), liquefied petroleum gas (LPG), hydrogen fuel cells, or other fuel types that have lower carbon content than traditional gasoline and diesel fuel. As engine technologies continue to advance, alternative-fueled vehicles have become increasingly popular to reduce fuel costs and emissions.

One of the primary challenges to increased adoption of alternative-fueled vehicles has been limited refueling infrastructure available to support the various vehicle types. Often referred to as “range anxiety”, an incomplete network of refueling infrastructure limits broad adoption of these vehicles as drivers feel confined to the limits of their known refueling locations. Local governments can play a role in combatting range anxiety by exploring cost-effective opportunities to install recharging infrastructure for electric vehicles, requiring pre-wiring for electric charging stations in new developments and parking lots, and working regionally to construct expensive infrastructure, such as CNG and LPG refueling stations.

The city has taken steps towards providing alternative fueling infrastructure through the installation of electric vehicle charging stations at the park-and-ride lot. The city will

continue to look for cost-effective opportunities to install additional electric vehicle charging stations in publicly accessible areas of the community, through grant funded opportunities or donations from technology providers. The city will also require pre-wiring for at-home electric vehicle charging stations in new development (that is not already permitted with an existing Development Agreement), and will work with STA to develop requirements for the installation of EV charging units in new parking lots. The city will continue to support STA's efforts to develop a regional CNG refueling station that could be used to refuel municipal fleet vehicles, and support efforts to make this charging station available for public use, if possible.

Action	Responsibility
A Continue to explore cost-effective ways to increase alternative vehicle charging / refueling infrastructure within the city	Building & Public Works; Planning; Sustainability Coordinator
B Require pre-wiring for at-home electric vehicle charging ports in future new single family and multi-family construction (i.e., those not currently permitted); update city's building code to reflect these changes	Building & Public Works
C Work with STA to develop informational brochures and technical support for developers / contractors interested in providing electric vehicle charging ports in new projects	STA; Building & Public Works; Planning;

Progress Indicators	Year
5% of gasoline passenger cars switch to plug-in hybrid electric (PHEV); 5% of gasoline light-duty trucks switch to PHEV; 5% of diesel passenger cars switch to PHEV; 5% of diesel light-duty trucks switch to PHEV	2020

Measure T-4.2: Municipal Alternative Fuel Vehicles

Supporting Measure – Not Quantified

Consider shifting municipal vehicle fleet from gasoline- and diesel-powered vehicles to alternative fueled vehicles, to the extent possible.



Measure Background

Compressed natural gas (CNG), hybrid vehicles, and plug-in electric vehicles are increasingly being incorporated into municipal fleets nationwide to help reduce vehicle-related emissions, lower operating costs, and show sustainability leadership at the local government level.

Many municipal fleet vehicles could be replaced with cleaner versions capable of performing the same tasks upon regular vehicle replacement. Passenger vehicles and light-duty trucks can often be replaced with battery electric vehicles or plug-in hybrid electrics. Some diesel-powered heavy-duty vehicles and equipment can be replaced

with CNG or LPG vehicles, if refueling infrastructure is available. Recent diesel and natural gas prices have made this type of replacement feasible from an economic standpoint as well.

In an effort to modernize the city’s municipal fleet, the city will support efforts to develop a regional alternative fuel vehicle procurement program to leverage economic benefits of bulk purchases. The city will also partner with STA in its efforts to develop a regional CNG refueling station for use by municipal fleets. Development of this facility could support future conversion of the FAST fleet to CNG vehicles.

Action	Responsibility
A Consider purchasing alternative fueled vehicles and/or more fuel-efficient vehicles during routine vehicle replacement	Building & Public Works
B Support STA in its efforts to develop a CNG refueling station for public and private use within Solano County	STA; Building & Public Works
C Pursue grant funding or vendor's promotional offers to install EV charging stations at city facilities for use by municipal vehicles	Building & Public Works; Sustainability Coordinator
D Consider partnering with other Solano County governments in regional alternative fueled vehicle procurement program to achieve lower vehicle costs through bulk procurement	Building & Public Works; Sustainability Coordinator

T-5: Transportation Demand Management

Measure T-5.1: Demand Management Program:

2020 GHG Reduction Potential: **135 MT CO₂e/yr**

2035 GHG Reduction Potential: **211 MT CO₂e/yr**

Provide informational resources to local businesses subject to SB 1339 transportation demand management program requirements and encourage voluntary participation in the program.



Measure Background

Transportation demand management (TDM) programs are a collection of policies and incentives that reduce travel congestion at peak commute hours. Common TDM practices include subsidized or pre-tax transit passes, flexible work hours, emergency rides home, vanpool or carpool incentives, and parking cash-out programs that pay employees who agree to give up their guaranteed parking spaces.

SB 1339 authorizes the Bay Area Air Quality Management District (BAAQMD) and Metropolitan Transportation Commission (MTC) to adopt and implement a regional ordinance known as the Bay Area Commuter Benefits Program. The program requires

employers with 50 or more employees within MTC’s jurisdiction to select one of four commuter benefit options (e.g. transit or vanpool subsidy).

The city will support STA, which is largely responsible for implementation of the TDM program, in its efforts to comply with program requirements. STA already has a well-established rideshare network and incentivizes the creation of new vanpools, which are seen as the likeliest path towards compliance for Solano County jurisdictions. The city’s existing park-and-ride lot provides 80 spaces adjacent to Highway 12, which can be used to help facilitate participation in carpooling programs.

BAAQMD has made funding available to help its members comply with the legislation. The city will also work with STA on an outreach campaign directed at local businesses of fewer than 50 employees, to attract voluntary participation in the TDM program.

Action	Responsibility
A Support STA's efforts to implement SB 1339 TDM program requirements	STA; Sustainability Coordinator
B Work with STA on outreach campaign targeting employers with 50 or fewer employees to encourage voluntary participation in TDM program activities, including pre-tax deductions for transit expenses, new vanpool creation, and Solano Commute Challenge	STA; Sustainability Coordinator

Progress Indicators	Year
1,050 employees voluntarily participate in rideshare program or telecommuting/alternative work schedule	2020
1,650 employees voluntarily participate in rideshare program or telecommuting/alternative work schedule	2035

Measure T-5.2: Intelligent Transportation

Supporting Measure – Not Quantified

Improve traffic signal coordination on major local roadways to reduce congestion during peak travel times.



Measure Background

Building an efficient transportation system can improve traffic flow and reduce congestion-related transportation emissions. Intelligent transportation systems (ITS) incorporate traffic signal synchronization on major roadways to reduce instances of “stop-and-go” traffic and vehicle idling.

Suisun City is currently partnering with CalTrans and the City of Fairfield on an ITS signal light coordination program to optimize seven intersections along SR-12. The city will

consider additional opportunities for future ITS programs, specifically along Sunset and Walters Roads and along Marina Boulevard.

Action	Responsibility
A Continue to partner with CalTrans on ITS signal light coordination program along SR-12	Building & Public Works
B Identify additional opportunities in Suisun City for signal coordination	Building & Public Works

Water Strategy

Water-related GHG emissions primarily come from the energy used to pump, transport, and treat potable water and wastewater. Water-related emissions accounted for approximately 5% of the communitywide GHG inventory.

With water supplies expected to continue declining into the future, water conservation strategies have the added benefits of aligning demand with future water availability, improving public health, and saving ratepayers money.

Senate Bill (SB) X7-7 (2009) requires the state to achieve a 20% reduction in urban per capita water use by December 31, 2020. The state is required to make incremental progress toward this goal by reducing per capita water use by at least 10% on or before December 31, 2015. SB X7-7 requires each urban retail water supplier to develop both long-term urban water use targets and an interim urban water use target. This law also creates a framework for future planning and actions for urban and agricultural users to reduce per capita water consumption 20% by 2020.

The GHG emissions reduction potential from implementing SB X7-7 locally is 522 MT CO₂e/yr in 2020, which represents 1.7% of total emissions. While the level of emissions reductions attributed to this measure is relatively small, the long-term water conservation benefits it provides are highly valuable to an agricultural community such as Solano County.

W-1: Urban Water Management Plan

Measure W-1.1: SB-X7-7

2020 GHG Reduction Potential: **522 MT CO₂e/yr**

2035 GHG Reduction Potential: **763 MT CO₂e/yr**

Support water districts' in their implementation of water conservation policies contained within Urban Water Management Plans.



Measure Background

The City of Suisun City is the urban water service provider to residents and businesses within the city limits. In accordance with state law, the city adopted its most recent Urban Water Management Plan (UWMP) in 2011.

As part of its UWMP, the city demonstrates its current and future abilities to provide water within its service boundaries. Additionally, SB X7-7 requires that urban water providers adopt conservation targets and implementation plans that will achieve a 20% per capita water use reduction by 2020. The city incorporated its water conservation targets and plan into its current UWMP. In general, the plan identifies best management practices (BMPs) in water conservation, including:

- + residential water surveys and retrofits,
- + system and large landscape water audits and leak detection,
- + metering and conservation pricing,
- + public information and educational programs,
- + energy efficient appliance and high-efficiency toilet rebate programs, and
- + water waste prevention measures.

In addition to the water conservation programs identified in the UWMP, the city adopted a Water Efficient Landscaping Ordinance. The ordinance applies to new and rehabilitated landscaping for public agency projects and private development projects (including developer-installed landscape at single-family and multi-family projects) with a landscaped area greater than 2,500 sq ft, and homeowner-installed landscapes greater than 5,000 sq ft. To demonstrate compliance with water conservation requirements, the ordinance requires preparation of a landscape documentation package that includes the following items:

- + project information,
- + water efficient landscape worksheet,
- + soil management report,
- + landscape design plan,
- + irrigation design plan, and
- + grading design plan.

This CAP assumes that the city will implement the BMPs identified within its UWMP, and will achieve its 2020 water conservation targets.

Action	Responsibility
A Implement water conservation policies contained within city's Urban Water Management Plan	City of Suisun City; Sustainability Coordinator
Progress Indicators	Year
20% reduction in per capita water use by 2020 over baseline established in UWMPs	2020 and 2035

Solid Waste Strategy

Waste disposal creates emissions when organic waste (e.g., food scraps, yard clippings, paper and wood products) is buried in landfills and anaerobic digestion takes place, emitting methane. Additionally, the extraction and processing of raw materials for consumer products, distribution to consumers, and eventual disposal of the products, creates emissions as well. In Suisun City, about 3% of GHG emissions are associated with solid waste generation and disposal in landfills.

The zero-waste concept in waste management is a high-level goal to increase communitywide solid waste diversion efforts above the 90% range. Implementation of the county's Integrated Waste Management Plan can help to shift waste generation patterns over time. Other opportunities to reduce waste and related emissions include programs to divert waste away from landfills, increase recycling rates, reuse waste byproducts (e.g. construction materials), and expand organic waste collection.

Recycling helps to remove organic materials, like recyclable paper and cardboard, from the waste stream where it would ultimately contribute to landfill methane emissions. One option to increase recycling is through the enhancement and promotion of commercial paper recycling campaigns, in an effort to divert a broader range of recyclable paper away from landfills. Additionally, measures can encourage coordination between local businesses, waste haulers, and the County Department of Resource Management to increase commercial waste diversion and identify reusable waste byproducts. Construction and demolition waste can also be diverted, in increasingly higher proportions, through recycling or material reuse.

Although a number of the solid waste measures presented below cannot be quantified at this time, the results of their implementation will still make meaningful contributions to statewide emissions reduction efforts. Their inclusion within this CAP also provides future opportunities for regional implementation efforts, should other local governments seek collaboration on any of these measures.

The total GHG emission reduction potential of the waste strategy is 132 MT CO₂e/yr in 2020. Solid waste reductions represent approximately 0.4% of total reductions in 2020.

SW-1: Waste Reduction

Measure SW-1.1: Landfill Diversion

Supporting Measure – Not Quantified

Maximize waste diversion communitywide through preparation of a solid waste strategic plan.



Measure Background

The purpose of a solid waste strategic plan is to establish a framework that allows a community to achieve long-term waste reduction goals. Implementation of such a plan would be a comprehensive effort including expanded recycling programs, green waste and organics collection, source reduction, and byproduct re-use from area industries. Assembly Bill 939 requires local jurisdictions to meet numerical diversion goals. Although landfill capacity is no longer considered the statewide crisis it once was, solid waste diversion programs protect public health and safety and extend the operable life of the area's landfills.

The Solano County Department of Resource Management works with local jurisdictions to prepare the *Countywide Integrated Waste Management Plan (CIWMP)* and its periodic updates. Suisun City will continue to work with the county on implementation of the CIWMP, and will establish a non-binding goal to exceed the 50% communitywide solid waste diversion requirements in AB 939. Longer-term strategies like this, while not intended to be implemented immediately, will help the city to make progress on its future emissions reduction goals. The city can also leverage its existing relationship with Republic Services to identify local opportunities for additional waste reductions.

Action	Responsibility
A Continue to work with the County Department of Resource Management to update and implement the Countywide Integrated Waste Management Plan (CIWMP)	Building & Public Works; Sustainability Coordinator
B Establish non-binding goal and implementing strategy to exceed 50% communitywide solid waste diversion requirements established by AB 939, either through updates to CIWMP elements or through preparation of standalone strategic plan	Building & Public Works; Sustainability Coordinator
C Work with franchise waste haulers to identify additional opportunities for solid waste diversion	Building & Public Works

Measure SW-1.2: Commercial Recycling Program

Supporting Measure – Not Quantified

Increase commercial paper recycling rates through implementation of AB 341 and targeted outreach campaigns.



Measure Background

Commercial establishments typically generate white paper, mixed office paper, newspaper, and corrugated cardboard. Approximately 90% of all office waste is paper. According to the US EPA, commercial establishments also generate a large portion of the estimated 24.1 million tons of corrugated cardboard discarded each year. Enhanced office paper recycling will help reduce emissions associated with organic landfill waste, and help to conserve raw materials.

Assembly Bill 341 (2011) requires development of commercial and multi-family residential recycling programs statewide. AB 341 also sets a 75% statewide recycling goal for 2020 (as compared to the 50% solid waste diversion requirements embodied in AB 939). As the city’s contract waste hauler, Solano Garbage Company has already reached out to commercial and multi-family property owners within the city to begin recycling service. Solano Garbage Company also provides assistance with commercial waste audits, employee training and education, and provides support to local businesses in selecting the appropriate recycling program for their needs.

The regional sustainability coordinator will work with area franchise waste haulers to develop informational materials to help increase office paper recycling. These materials should highlight the broad range of office paper products that can be recycled.

Action	Responsibility
A Support franchise haulers, as necessary, in their outreach efforts to increase recycling rates among commercial and multi-family residential customers, as specified in AB 341	Building & Public Works; Sustainability Coordinator
B Work with County Department of Resource Management and franchise waste haulers to develop enhanced paper recycling outreach campaign directed at office managers that explains full range of recyclable paper products that can be diverted from solid waste stream	Building & Public Works; Sustainability Coordinator

Measure SW-1.3: Source Reduction Program

Supporting Measure – Not Quantified

Identify opportunities for creative reuse of industrial waste material.



Measure Background

Source reduction programs are strategies to reduce the volume of waste generated by certain activities or processes, and are designed to eliminate waste before it is created. These programs typically influence the design, manufacturing, and packaging of goods and materials to decrease both resource inputs and waste outputs. These programs can also be applied at the broader community level to address certain waste-generating activities. The promotion of reusable shopping bags is a common source reduction program intended to minimize solid waste disposal and pollution associated with plastic bag use.

At the individual business scale, source reduction programs can result in operational costs savings related to solid waste disposal or even become a revenue generator. For example, the Campbell Soup Company (with local operations in Dixon) has waste recycling programs that focus on recycling food waste, corrugated paper, steel drums, office paper, plastic, fluorescent tubes, batteries, wood pallets and scrap metal. In addition, Campbell's Asset Recovery program recycled or reused almost 1.2 million pounds of used equipment in 2012, generating nearly \$700,000 in sales revenue.^{xi}

Certain businesses may also find that the waste materials produced from their operations can be used as the input material for another business. This type of symbiotic relationship could result in operating costs savings for both businesses, if these industry connections can be identified. Solano County's agricultural sector could be an excellent candidate if beneficial reuse opportunities can be found for its organic waste stream. The Solano Center for Business Innovation has organized round table discussions with Allied Waste, one of the franchise waste haulers operating within the county, to identify opportunities for waste reuse at a local industrial park. This type of discussion could be expanded to include other waste haulers, large waste generators, and business leaders to identify interconnection among the county's industries and businesses. Results from these discussions could help inform a targeted economic development campaign. If a beneficial waste product is found to be in abundance, businesses that use such a product as an input material could be enticed to co-locate closer to the resource. The city will partner with the Solano Center for Business Innovation, franchise waste haulers, and local industries to identify potential byproduct reuse.

Action

Responsibility

A Work with Solano Center for Business Innovation, region's franchise waste haulers, and local industries to identify opportunities to reuse waste byproducts from one manufacturing process as input materials for another	Sustainability Coordinator; Solano Center for Business Innovation
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SW-2: Organic Waste

Measure SW-2.1: Residential Food Scrap and Compostable Paper Diversion

2020 GHG Reduction Potential: **13 MT CO₂e/yr**

2035 GHG Reduction Potential: **400 MT CO₂e/yr**

Encourage participation in collection of food scraps in green waste bins through public outreach campaigns.



Measure Background

According to CalRecycle, food scraps comprised nearly 16% of the state's total waste stream, including more than 25% of the residential waste stream.^{xii} Food scraps are unwanted cooking preparation and table scraps, such as banana peels, apple cores, vegetable trimmings, bones, egg shells, meat, and pizza crusts. Compostable paper, sometimes called food-soiled paper, usually comes from the kitchen and is not appropriate for paper recycling due to contamination. Materials such as stained pizza boxes, uncoated paper cups and plates, used coffee filters, paper food cartons, napkins, and paper towels are all compostable paper. Diverting these organic items from the landfill helps to reduce methane gas generation from anaerobic decomposition, and helps to extend the operable life of a landfill.

Suisun City's current waste hauling contract with Solano Garbage Company allows for collection of food items such as, coffee grounds, egg shells, grain products, baked goods, bones, meat, and fish in its green waste bins. However, there is limited participation data available to determine what percentage of household food waste is successfully being diverted. To encourage additional participation in this type of collection, the city will partner with the Solano County Resource Management Department and Solano Garbage Company on public outreach campaigns, including local elementary school programs, explaining what foods can be composted and why it is important. These outreach campaigns should leverage existing information materials developed by StopWaste.org and the City of San Francisco to the extent possible. The city will also discuss opportunities with their franchise waste hauler to expand the existing food scrap collection program to include compostable paper in the city's green waste bins.

Action	Responsibility
A Partner with Solano County Resource Management Department and franchise waste haulers on public outreach campaign promoting food scrap collection in green waste bins	Building & Public Works; Sustainability Coordinator
B Provide information to local elementary schools on existing food scrap diversion program for incorporation into on-going recycling curriculum	Building & Public Works; Sustainability Coordinator
C Meet with franchise waste hauler to discuss contract amendment to include compostable paper (e.g., soiled paper plates, napkins, paper towels) collection service through green waste bins	City Manager's Office

Progress Indicators	Year
25% of households divert 20% of their food scraps through green waste bins or on-site composting	2020
50% of households divert 75% of their food scraps and compostable paper through green waste bins or on-site composting	2035

Measure SW-2.2: Commercial Food Scrap Collection

2020 GHG Reduction Potential: **5 MT CO₂e/yr**

2035 GHG Reduction Potential: **69 MT CO₂e/yr**

Develop a voluntary commercial food scrap collection pilot program that targets restaurants, hotels, and other food vendors.



Measure Background

According to CalRecycle, food scraps comprised nearly 16% of the state's total waste stream, including more than 15% of the total commercial waste stream.^{xiii} Commercial food scrap generators include facilities with industrial kitchens, such as hotels, restaurants, schools and universities, and conference centers, as well as food distributors, such as grocery stores. Other commercial land uses, like offices and retailers, typically generate much lower volumes of food scraps than these other uses.

Some cities, such as Fairfield, have implemented commercial food scrap collection pilot programs to help divert organic materials from the solid waste stream. These programs typically work to remove logistical barriers associated with food scrap collection, including space limitations for additional collection bins, odor and pest control related to collection frequency, and employee training and/or customer education on how the programs work. The city will first research best practices in similarly sized communities, and then work with local business organizations and franchise waste haulers on development of a voluntary food scrap collection program for the city. The city will also

explore opportunities with the City of Fairfield to expand their existing program into Suisun City, to provide implementation efficiencies.

Action	Responsibility
A Work with franchise waste haulers, the Fairfield Suisun City Chamber of Commerce, and other local business organizations to encourage participation in a voluntary commercial food scrap collection program	Building & Public Works; Sustainability Coordinator
B Identify opportunities to share best-practices and lessons learned with other cities in Solano County that have implemented similar programs	Sustainability Coordinator

Progress Indicators	Year
20% of commercial businesses divert 50% of their food scraps from solid waste stream	2020
40% of commercial businesses divert 75% of their food scraps and compostable paper from solid waste stream	2035

Measure SW-2.3: Yard Waste Diversion

2020 GHG Reduction Potential: **54 MT CO₂e/yr**

2035 GHG Reduction Potential: **171 MT CO₂e/yr**

Encourage participation in yard waste diversion through public outreach campaign.



Measure Background

Yard waste includes leaves, grass clippings, and downed branches, and can easily be composted through either backyard composting or yard waste collection programs. Yard waste diversion helps avoid methane generation at landfills, extends a landfill's operable lifetime, and provides opportunities for beneficial reuse of this nutrient-rich organic material. Suisun City residents receive a green waste bin from the city's franchise waste hauler for home yard waste collection, including grass cuttings, small tree and bush trimmings, leaves, flowers, and weeds.

Participation rates are typically very high throughout the state for residential green waste collection since the programs are easy to understand and collection bins are often provided as part of regular solid waste collection service. To enhance participation in the compostable food collection program described in Measure SW-2.1, the city will partner with the Solano County Resource Management Department and franchise waste haulers to promote the disposal of yard waste and food scraps in green waste bins.

Action	Responsibility
A Partner with Solano County Resource Management Department and franchise waste haulers on public outreach campaign to promote use of green waste bins for yard waste collection instead of trash bins; campaign should be combined with food scrap diversion efforts	Building & Public Works; Sustainability Coordinator

Progress Indicators	Year
90% of residential units divert 95% of their yard waste through green waste bins or on-site composting; 90% of non-residential properties divert 95% of their yard waste through green waste bins or on-site composting;	2020
90% of residential units divert 95% of their yard waste through green waste bins or on-site composting; 90% of non-residential properties divert 95% of their yard waste through green waste bins or on-site composting;	2035

Measure SW-2.4: Construction and Demolition Waste

2020 GHG Reduction Potential: **60 MT CO₂e/yr**

2035 GHG Reduction Potential: **289 MT CO₂e/yr**

Enforce construction and demolition waste diversion requirements in State's Green Building Code.



Measure Background

According to CalRecycle’s 2008 Statewide Waste Characterization Study, construction and demolition (C&D) materials account for approximately 29 percent of the waste stream in California, including scrap lumber which comprises nearly 15% of the statewide total^{xiv}. Scrap lumber is an organic material, and therefore generates methane emissions through anaerobic decomposition in a landfill. It is also a highly reusable material, which helps conserve virgin natural resources. Many other construction materials can also be diverted from the waste stream for reuse or recycling, including concrete and asphalt, bricks, scrap metal, and drywall.

The California Green Building Code currently requires 50% diversion of C&D materials for all new residential and commercial projects, with few exceptions. CalRecycle provides a list of best practices and other resources on its website to help cities and contractors comply with this requirement. As green building practices become more common in the region, waste haulers and contractors will improve their abilities to divert higher percentages of C&D waste in support of project documentation requirements for various green building certification programs (e.g., LEED, Green Point Rated).

Implementation and monitoring challenges limit full participation in the state’s C&D diversion efforts, even though the requirements are codified in the Green Building Code.

Some communities, such as Fairfield, have adopted formal ordinances establishing diversion thresholds. Others have gone a step further to develop a C&D diversion deposit program, in which the project applicant pays a deposit (as a percentage of total project costs or on a square foot basis) in exchange for a building permit. The deposit is reimbursed to the applicant upon submittal of appropriate documentation showing what level of diversion was achieved by the contractor or waste hauler. The program could also be structured to forgo deposit requirements if applicants provide a signed contract with an authorized C&D collector that clearly states the level of diversion to be achieved.

The city will consider increasing its diversion requirements to 75% of scrap lumber or 75% of total C&D waste as part of future CAP updates, provided that local C&D collectors and area landfills can achieve higher diversion rates. The city will also consider development of a C&D diversion deposit program to ensure compliance with this requirement.

Action	Responsibility
A Consider increasing diversion requirements to 75% diversion; alternatively, only target scrap lumber with 75% diversion requirement	Building & Public Works
B Consider developing Construction and Demolition Debris Diversion Deposit Program to help enforce C+D ordinance, in which deposit is paid to city prior to issuance of building permit and refunded to applicant following submittal / approval of applicable waste diversion documentation	Building & Public Works; Sustainability Coordinator

Progress Indicators	Year
50% of C&D waste is diverted from 90% of applicable new construction/renovation projects	2020
75% of C&D waste is diverted from 90% of applicable new construction/renovation projects	2035

Green Infrastructure Strategy

Green infrastructure refers to the natural features of a community that also provide an often unnoticed community benefit. In Suisun City, green infrastructure includes the urban forest, parks, landscaped medians and parkways, and other natural landscapes. These areas can reduce the urban heat island effect, perform stormwater management, and improve air quality and public health.

As one component of the green infrastructure network, urban forests provide shade and can reduce the heat island effect, which causes temperatures to increase in areas with concentrations of exposed pavement and rooftops. These higher temperatures can lead to increased air conditioner use, which increases energy consumption and can strain utility infrastructure at peak hours of the day. Urban forests also provide a visual amenity for residents and habitat value for wildlife.

The city also recognizes other beneficial aspects of trees. Trees beautify neighborhoods, increase property values, reduce noise and air pollution, and create privacy. Additionally, trees gain carbon-sequestering biomass in their trunks and roots as they absorb carbon dioxide from the air to grow. The measure in this section seeks to enhance Suisun City's already well-established urban forest.

The total GHG emission reduction potential of the Green Infrastructure Strategy is 586 MT CO₂e/yr in 2020. This represents about 2% percent of total 2020 reductions anticipated from CAP implementation.

GI 1: Green Infrastructure

Measure GI1.1: Urban Forest program

2020 GHG Reduction Potential: **586 MT CO₂e/yr**

2035 GHG Reduction Potential: **1,171 MT CO₂e/yr**

Support natural carbon sequestration opportunities through development and maintenance of a healthy, vibrant urban forest using outreach, incentives, and strategic leadership.



Measure Background:

Suisun City's urban forest comprises trees planted on both public and private lands. The city's development standards include landscaping requirements for the planting of street trees and parking lot vegetation. In addition to these required plantings, private property owners often choose to incorporate trees into their landscaping. Collectively, these trees represent the city's urban forest, and provide air quality benefits, shading,

wildlife habitat, natural stormwater management benefits, visual character, and long-term carbon sequestration.

The city will enforce existing tree-planting requirements for new construction and parking lots, including the new shade tree ordinance described in Measure E-5.1. The city will also identify neighborhood groups and/or urban forestry organizations that can be engaged to help promote a healthy urban forest. These organizations could assist in tree planting campaigns designed to increase the voluntary planting of shade trees or landscape trees. They could also play a role in nurturing new street trees through an adopt-a-tree program to reduce the burden on the Public Works Department. The city could also consider developing a tree protection ordinance requiring the replacement of removed street trees. The city could provide guidance on planting site selection to ensure that tree replacements are appropriately planted to minimize potential root damage to driveways, sidewalks, and underground utilities.

Action	Responsibility
A Enforce existing tree-planting requirements for new construction and parking lots, including new shade tree ordinance described in CAP energy measures	Planning
B Identify opportunities to partner with urban forest organizations or similar groups to encourage voluntary tree planting and proper maintenance	Planning; Sustainability Coordinator
C Advertise shade-tree-giveaway programs or other incentives, when available	Planning; Sustainability Coordinator
D Consider developing tree protection ordinance that requires replacement of removed street trees	Planning

Progress Indicators	Year
4,750 new trees planted in the community	2020
9,500 new trees planted in the community	2035

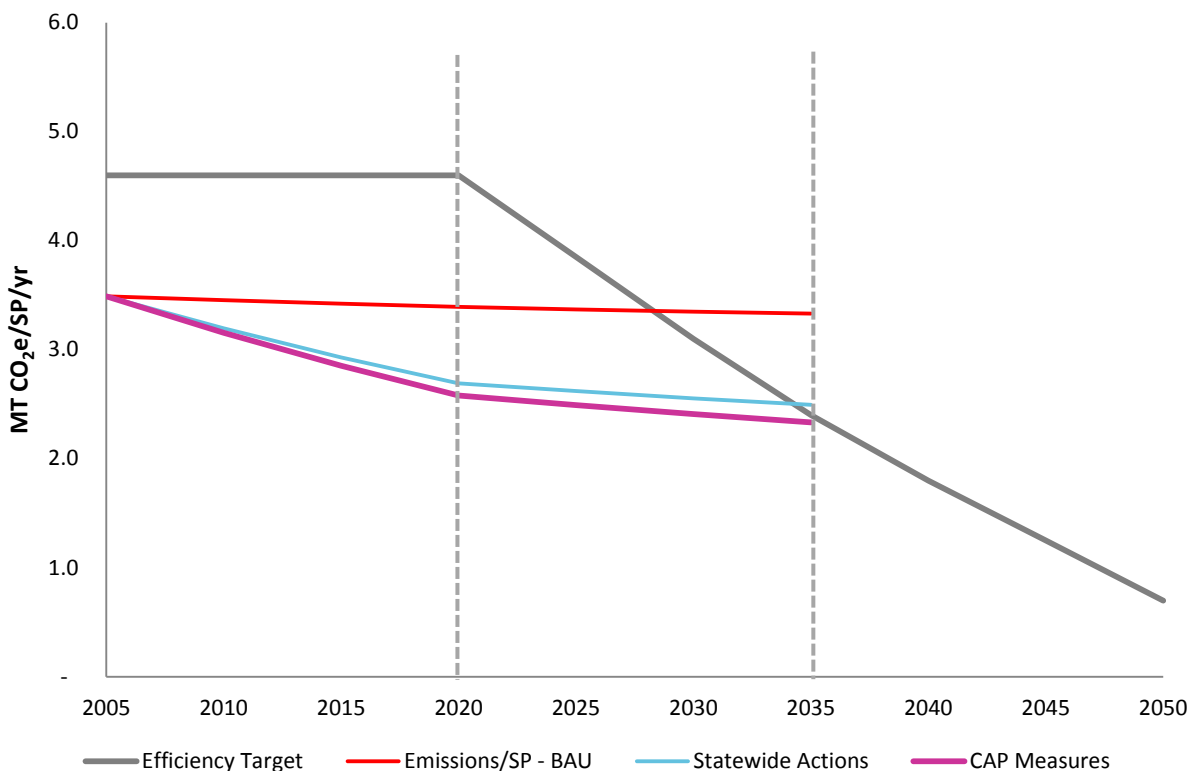
Target Achievement

PROGRESS TOWARD 2020 TARGET

The measures described above, combined with the state actions described in Chapter 2, have the potential to reduce communitywide emissions by 30,679 MT CO₂e/yr from projected 2020 levels. Although the nature of the community's emissions projections combined with the service population target established in Chapter 2 would require no local or statewide action to achieve the 2020 target, measures included in this CAP will result in deep emissions reductions by 2020. This progress **exceeds** the city's 2020 reduction target of 4.6 MT CO₂e/SP/yr, demonstrating near-term achievement of 2.6 MT CO₂e/SP/yr. The early actions included within this CAP will help to put the city on a trajectory towards longer-term reduction targets.

Figure 3.2 shows the additive impact of statewide actions and local actions that achieve the city's 2020 target. Business-as-usual emissions forecast through 2035 are shown in red. The impact of known and quantifiable statewide actions is shown in blue, with the local actions of this CAP's measures shown in fuchsia. The vertical dashed gray lines mark the 2020 and 2035 horizon years. As shown, the combination of statewide and local actions reduces the city's emissions well below the solid gray target line in 2020, indicating target achievement, and also shows achievement of the 2035 target as well.

Figure 3.2 – 2020 Target Achievement



PROGRESS TOWARD 2035 TARGET

As shown in Figure 3.2, the city will also likely achieve a 2035 target with the identified statewide and local measures alone. Emissions reductions totaling 40,388 MT CO₂e/yr would be required to achieve the 2035 target (i.e., 2.4 MT CO₂e/SP/yr). This CAP estimates future reductions of 42,999 MT CO₂e/yr in 2035, or 2.3 MT CO₂e/SP/yr.

Several variables will influence the city's ability to achieve future longer-term targets. First, statewide actions, which provide the majority of reductions in this CAP, are shown to flat-line beyond the 2020 horizon year. This is due to the fact that the Scoping Plan has only quantified the impacts of statewide actions through 2020. While the 2008 Scoping Plan has been revised, the new and revised actions included therein have not yet been quantified, so local governments are not yet able to take credit for the local share of those actions. It is likely that the state will continue to develop actions and programs that will support achievement of its 2050 statewide reduction target. However, at this time the potential future impact of those actions is unknown.

Second, new technologies that support additional emissions reduction may be developed between now and 2035. Existing technologies may also become more effective or financially viable for increased implementation. One example is the cost and ubiquity of solar photovoltaic panels, which have experienced exponential market growth during the last few decades. Increased renewable energy development could be a large source of future emissions reductions.

Third, additional local CAP measures may be developed during future plan updates, or CAP measures may be implemented at higher rates than previously estimated. The 2035 reduction estimates are based on the best available data and assumptions, but the future is difficult to predict accurately. Regular emissions inventory updates will be the best predictor of future target achievement, and will help the city to identify emissions sectors that need additional attention.

Fourth, and final, future target achievement is based on numerous growth estimates, which may or may not be accurate in reality. If the city grows faster than anticipated in the emissions inventories, it will become harder to achieve long-term targets without deeper implementation of CAP measures. However, if the city grows more slowly, so too will its emissions, potentially making future targets easier to achieve.

LONG-TERM REDUCTION OPPORTUNITIES

As part of the CAP development process, the participating cities considered several measure options that would provide long-term reduction opportunities, but would also require regional collaboration for successful implementation. These additional measures could be applied to the estimated statewide and local actions included in this CAP to demonstrate a pathway towards future target achievement (e.g., 2050). However, these options were not developed with the same level of detail as the local CAP measures included in this chapter, and are provided here for informational purposes only. Rough estimates of future emissions reduction potential were calculated using readily-available data and studies. Additional analysis would be required to ensure their feasibility for local implementation.

These measures were included here so that conversations with regional partners and local residents can begin early, with the hope that some or all of the measures are ready to begin implementation by 2020.

PG&E Green Option

2035 Reduction Potential (Municipal): 331 MT CO₂e/yr

PG&E is in the process of finalizing its proposed Green Option Program, which would allow customers to voluntarily purchase 100% renewable electricity. The California Public Utilities Commission (CPUC) will respond to PG&E's proposed program by July 1, 2014. If approved, PG&E expects the program to be available for subscription within a few months following approval. The program is currently expected to be capped at 125 MW of demand and for a five-year pilot program. It is currently unknown how participation will be granted should the program become fully-subscribed.

The city could consider participating in this program so that 100% of municipal electricity is generated from renewable sources. Though municipal emissions only represent a fraction of total communitywide emissions, this program provides an opportunity to demonstrate regional leadership in emissions reductions. Residents and local businesses will also be able to voluntarily participate in this program. A similar program offered by the Sacramento Municipal Utility District currently has an approximately 10% voluntary participation rate.

City Actions to Consider

- + Review participation costs with regards to municipal electricity expenses when final program information is available
- + Evaluate benefits to city's participation

Community Choice Aggregation

2035 Reduction Potential (75% participation): 11,210 MT CO₂e/yr

This option is included above as a stand-alone measure to highlight its importance for long-term target achievement. As described in Measure E-7.5, community choice aggregation allows a city or cities to supply electricity to customers within their borders through the establishment of a CCA. Solano County included a measure in their CAP to explore development of a CCA in partnership with the county's cities. CCA's are typically designed as an opt-out program, which means that all residents and businesses within its boundaries are automatically enrolled in its service with the ability to opt out and remain with PG&E as their utility provider. This type of enrollment is one reason that CCA programs enjoy high participation rates. For example, Marin Clean Energy began serving customers in May 2010, and currently procures electricity for 75% of electric customers in Marin County.

The city could consider participating in regional conversations regarding opportunities and challenges to establishing a Solano County CCA.

City Actions to Consider

- + Collaborate with regional partners to evaluate feasibility for CCA development (e.g., start-up costs, funding sources, legal considerations, participation estimates)

Alternative Fuel Vehicles

2035 Reduction Potential: 9,751 MT CO₂e/yr

Advancements in alternative fuel vehicle technologies make long-term market adoption seem likely. As described in Measure T-4.1 above, there are actions the city can take to facilitate this market transition, including pre-wiring requirements in new construction for electric vehicle charging stations, pursuit of grant funding to install public charging infrastructure, and collaboration with STA and local cities on development of a CNG refueling station. The reduction potential shown above is dependent upon decreasing vehicle costs resulting from further technological advancement and increasing market adoption that brings to bear economies of scale in automotive manufacturing. This estimate includes a transition away from gasoline and diesel vehicles to plug-in hybrid electric vehicles, battery-electric vehicles, and compressed natural gas vehicles throughout the range of vehicle class categories (e.g., passenger cars, light duty trucks, buses).

As the use of electric vehicles increases, it will become more important to clean the electricity grid in order to maximize the emissions reductions associated with alternative fuel vehicles.

City Actions to Consider

- + Research best-practices in facilitating market shift towards alternative fuel vehicles through local policies
- + Participate in regional collaboration on CNG refueling station
- + Explore opportunities to convert Ready-Ride vehicles to alternative fuel vehicles

Advanced Methane Capture

2035 Reduction Potential (95% capture): 2,818 MT CO₂e/yr

The city could explore opportunities with their franchise waste hauler to send the community's solid waste to a landfill facility with a highly-efficient methane control system. These advanced systems can capture 90-95% of fugitive methane emissions, significantly reducing solid waste emissions. A variety of factors should be considered before pursuing this option. The city should work with their franchise waste hauler to identify nearby landfills that have advanced methane capture systems and capacity to accept new customers. The cost premium of shipping to such a facility should also be considered, particularly as compared to the amount of emissions that could potentially be reduced. Further analysis may indicate that this option is either technically or financially infeasible.

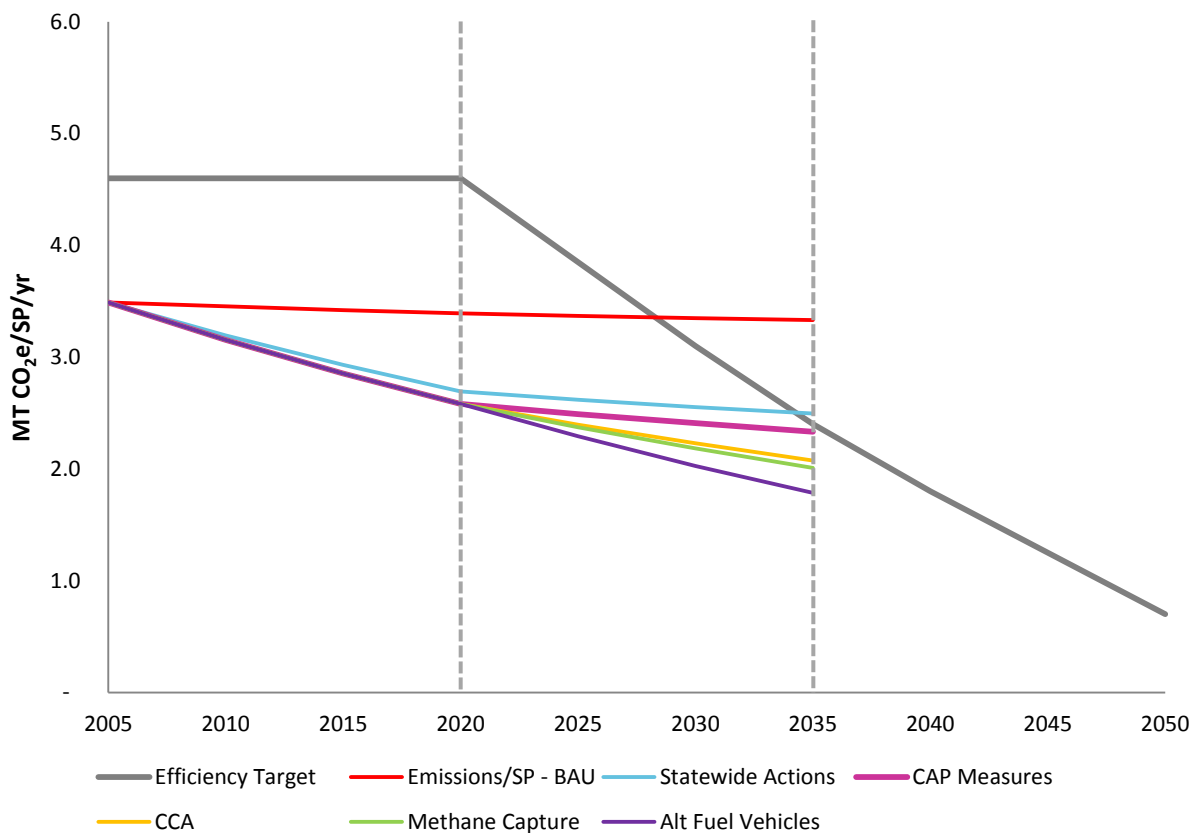
City Actions to Consider

- + Identify area landfills with advanced methane capture systems
- + Discuss potential costs with franchise waste haulers
- + Further analyze emissions reduction potential; compare to future emissions reduction gap and potential costs

Figure 3.3 shows that development and implementation of these measures (excluding the PG&E Green Option to avoid double-counting with the CCA program) would greatly exceed the 2035 target, and demonstrate a trajectory towards the 2050 statewide target. Combined with the reduction estimates in Table 3.1, these measures would bring total reductions to 66,778 MT CO₂e/yr in 2035, which represents 1.8 MT CO₂e/SP/yr.

Figure 3.3 provides a framework to demonstrate what it will take to mirror the state's aggressive long-range targets at the local level. The largest reduction opportunities known at this time are likely to come from cleaner electricity sources and a large-scale shift towards alternative-fuel vehicles.

Figure 3.3 – Long-Term Reduction Options



Notes

ⁱ US Census, 2010.

ⁱⁱ PG&E, 2012. Available at:
http://www.pgecorp.com/sustainability/en03_clean_energy.jsp.

ⁱⁱⁱ US Census, 2010.

^{iv} California Energy Commission. *2009 California Residential Appliance Saturation Study*. Prepared by KEMA, October 2010.

^v *ibid.*

^{vi} National Renewable Energy Laboratory Renewable Resource Data Center, 2011.

^{vii} PG&E. *PG&E Generation Interconnection Services Progress Report for Suisun City*. October 2012.

^{viii} California Energy Commission. *Solar Water Heating CEC 2013 Title 24 Pre-rulemaking Workshop*. June 9, 2011.

^{ix} PG&E, October 2012.

^x PG&E. *Case Study: Fairfield Suisun Sewer District Integrated Energy Management*. August 2009.

^{xi} Campbell's Soup, 2012. Available at:
http://csr.campbellsoupcompany.com/csr/pages/resources/reports-and-data.asp#UxTKgvldV_4.

^{xii} California Integrated Waste Management Board. *California 2008 Statewide Waste Characterization Study*. Prepared by Cascadia Consulting Group, August 2009. Available at: <http://www.calrecycle.ca.gov/Publications/Documents/General/2009023.pdf>.

^{xiii} *ibid.*

^{xiv} *ibid.*

CHAPTER 4

BENCHMARKS + IMPLEMENTATION

4

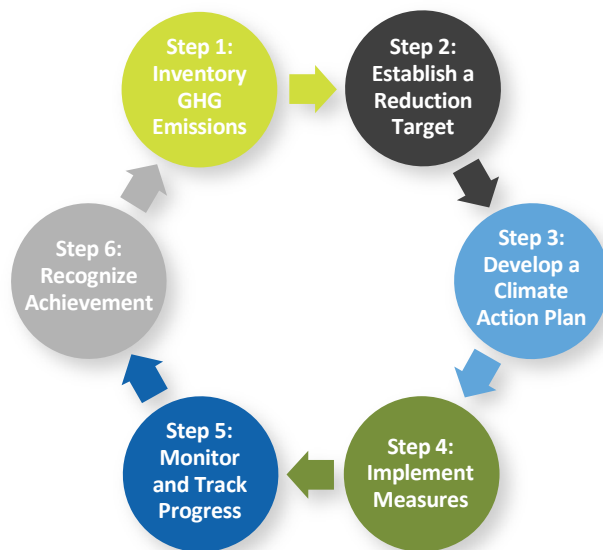
This chapter describes how city staff will implement CAP measures and related actions, and track the performance metrics identified for each measure as part of the larger Regional CAP Program. The chapter also discusses the need to evaluate, update, and amend the CAP over time, so the plan remains effective and current. Using the CAP to evaluate future project consistency is presented with regards to mandatory and voluntary nature of the CAP's measures. Lastly, the chapter gives an overview of potential funding sources to support CAP implementation. While funding sources are continually evolving, this section presents types and sources of funding that are currently, or known to be regularly, available in order to help focus the city's effort.

Implementation and Monitoring

Ensuring that the CAP measures translate from policy language into on-the-ground results is critical to the success of the plan. To facilitate this, each measure described in Chapter 3 contains a table that identifies specific actions which the city will carry out, and the departments responsible for each action. Each table also provides performance metrics to enable city staff, the City Council, and the public to track measure implementation and monitor overall CAP progress. The tables provide both interim (2020) and final (2035) performance metrics. Interim performance metrics are especially important, as they provide checkpoints to evaluate if a measure is on the right path to achieving its GHG reductions.

Figure 4.1 was presented in Chapter 1 to describe the first three steps in the CAP development process. This chapter describes strategies to approach Steps 4 and 5, which cover the implementation and monitoring process.

Figure 4.1 – Steps in the CAP Development Process



PERFORMANCE METRICS

The performance metrics are directly related to the estimated GHG emissions reductions. Therefore, they are written to provide a quantifiable measurement to accurately track progress toward the reduction target. For example, Measure E-7.1 encourages voluntary installation of rooftop solar photovoltaic systems. The measure’s estimated GHG emissions reductions are based on numerous assumptions, including the number of residential and commercial buildings that will install solar photovoltaics between 2005 and the 2020 and 2035 target years (including those that have already installed systems since 2005). The performance metric assumes that 625 single-family

residential buildings will include a 4.5 kW solar PV system by 2020 (in addition to those already existing in the 2005 baseline year). This measure also assumes that 2.0 MW of new solar photovoltaic capacity will be installed on multi-family and commercial buildings by 2020. If there is greater adoption of solar photovoltaics than estimated in this measure, then additional emissions reductions will occur. Likewise, if installations fall short of the estimates described here, then this measure will achieve less than its stated reductions. Participation rate assumptions are described in Appendix C.

STAFFING AND COORDINATION

Upon adoption of the CAP, the city departments identified for each measure in Chapter 3 will become responsible for implementing assigned actions. Key staff in each department will facilitate and oversee this work, working in tandem with the proposed regional Sustainability Coordinator. To assess the status of city efforts, CAP plan implementation meetings should take place several times a year. Some actions will require inter-departmental or inter-agency cooperation, and appropriate partnerships will need to be established.

REGIONAL CLIMATE ACTION PLANNING PROGRAM COORDINATION

This CAP was developed in tandem with three other Solano County cities as part of a Regional Climate Action Planning Program. To ensure an approach that is mutually beneficial and efficient, measures and actions were developed with regional relevance. Table 4.1 provides a summary of the measures identified in Chapter 3 as candidates for regional implementation. These measures have the potential to save city resources and effort when coordinated and implemented regionally. Appendix E presents the full list of regional implementation opportunities that were considered, including a comparison to the adopted CAPs of Solano County and the Cities of Benicia and Vallejo.

The primary option for developing and managing a successful regional strategy is to establish the role of Sustainability Coordinator (see Measure CC-1.1 in Chapter 3) to facilitate this process, either at the city-level or as a regional position housed within a county agency. This person would have the ability to work with the participating cities on implementation of regional measures, as well as coordinate with Solano County and city staff from Benicia, Vallejo, and Vacaville on countywide programs. Additional funding would be needed to support development of regionally applicable outreach campaigns and shared resources, such as a Solano County Sustainability Website (see Measure CC-1.2 in Chapter 3).

**Table 4.1
Regional Implementation Measures**

CROSS-CUTTING STRATEGY		CITIES¹	RESPONSIBILITY
CC-1.1	Sustainability Coordinator	All	Community Development; Solano EDC
CC-1.2	Public Outreach	All	Community Development; Sustainability Coordinator
ENERGY STRATEGY		CITIES	RESPONSIBILITY
E-1. Existing Buildings			
E-1.1	Energy Efficiency Retrofit Outreach	All	Sustainability Coordinator; Community Development; Building Division
E-1.2	Energy Efficiency Audits	All	Solano Center for Business Innovation; Sustainability Coordinator; Community Development
E-3. Financing			
E-3.1	Energy Efficiency Rebate Program	All	Sustainability Coordinator; Community Development
E-3.2	PACE Financing Program	All	Solano Center for Business Innovation; Building Division
E-4. Building Appliances			
E-4.1	ENERGY STAR Appliances	All	Sustainability Coordinator; Community Development; Building Division
E-4.2	Smart Grid	All	Building Division; Sustainability Coordinator
E-6. Building Lighting			
E-6.1	Building Lighting Efficiency	All	Building Division; Sustainability Coordinator
E-7. Renewable Energy			
E-7.3	Community Choice Aggregation	All	Sustainability Coordinator
E-8. Street and Area Lighting			
E-8.1	Street Light Upgrade	Dixon, Rio Vista, Suisun City	Public Works
TRANSPORTATION + LAND USE STRATEGY		CITIES	RESPONSIBILITY
T-1. Pedestrians + Bicycles			
T-1.3	Bicycle Outreach Program	All	STA; Public Works
T-4. Alternative Fuels			
T-4.2	Municipal Alternative Fuel Vehicles	All	STA; Public Works; Building Division; Sustainability Coordinator

SOLID WASTE STRATEGY		CITIES	RESPONSIBILITY
SW-1. Waste Reduction			
SW-1.3	Source Reduction Program	All	Sustainability Coordinator; Solano Center for Business Innovation
SW-2. Organic Waste Diversion			
SW-2.1	Residential Food Scrap and Compostable Paper Diversion	All	Sustainability Coordinator; City Manager's Office
SW-2.2	Commercial Food Scrap Collection	All	Sustainability Coordinator
SW-2.3	Yard Waste Diversion	All	Sustainability Coordinator
GREEN INFRASTRUCTURE STRATEGY		CITIES	RESPONSIBILITY
GI-1. Green Infrastructure			
GI-1.1	Urban Forest Program	All	Sustainability Coordinator; Community Development

Note:

¹ The designation of All Cities includes Dixon, Fairfield, Rio Vista, and Suisun City

Program Evaluation and Evolution

The CAP represents the city's initial attempt to create an organized, communitywide plan to reduce GHG emissions. City staff will need to evaluate the plan's performance over time, and be ready to alter or amend the plan in the future if it is not on track to achieve its reduction targets.

PROGRAM EVALUATION

Two types of performance evaluation are important:

- (1) Evaluation of the community's overall ability to reduce GHG emissions, and
- (2) Evaluation of the performance of individual CAP measures.

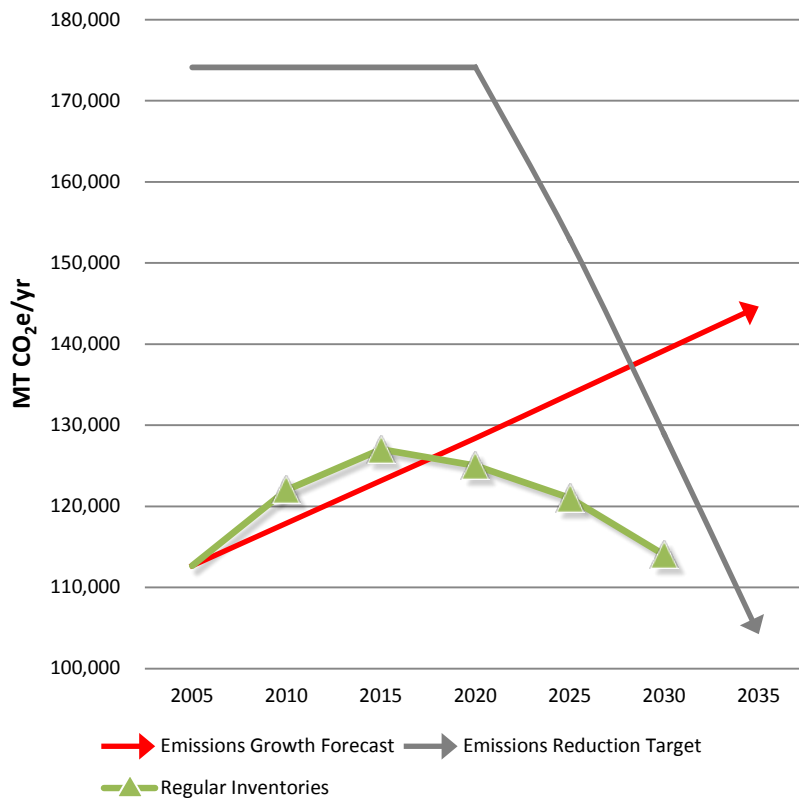
GHG Inventory Updates

Regular communitywide GHG emission inventories will provide the best indication of CAP effectiveness. It will be important to reconcile actual growth in the city versus the growth projected when the CAP was developed. Conducting these inventories periodically will enable direct comparison to the 2005 baseline inventory and will demonstrate the CAP's ability to achieve the adopted reduction target.

The Community Development Department, in conjunction with the proposed Sustainability Coordinator, will prepare communitywide inventories every three to five years following adoption of the CAP to assess progress toward the GHG emissions reduction targets. Figure 4.1 gives an example of how regular communitywide inventories can help track progress toward the reduction targets compared to the business-as-usual emissions forecasts. In the hypothetical scenario shown, communitywide emissions actually increase through 2015 before they start declining to

achieve the long-term reduction target. This type of communitywide overview is the easiest way to determine if the CAP measures are being effectively implemented.

Figure 4.2 – Example of Future Emissions Inventory Monitoring



Source: AECOM 2014

CAP Measure Effectiveness

While communitywide inventories provide information about overall emission reductions, it will also be important to understand the effectiveness of each measure. Evaluation of the emissions reduction capacity of individual measures will improve staff and decision makers’ ability to manage and implement the CAP. The city can reinforce successful measures and reevaluate or replace under-performing ones. Evaluating measure performance will require data regarding actual community participation.

Applying the Measure Tracking Template

Table 4.2 provides an example of a measure tracking template that could be used to monitor the efficacy of each CAP measure. The table is similar to the measure tables included in Chapter 3, but has been expanded to include phasing and tracking mechanisms. The phasing column allows each responsible department or agency to identify internal timelines for implementing specific action steps. These could be expressed as specific target years or more generally as short-, medium-, and long-term actions. The tracking mechanisms specify how implementation of the progress indicators will be monitored. Similar to the future communitywide inventories, the progress indicators should be evaluated regularly to ensure each measure is on track to

achieve its stated emissions reductions. If during the implementation review process a measure is found to be falling short of its performance targets, then additional attention can be given to modifying the implementation strategy. If implementation review indicates that a measure will be unable to achieve its stated reduction level, then additional CAP measures could be developed to make up the difference or other measures could be enhanced to increase their reduction potential. For this reason, CAP implementation should be an iterative process to reflect future changes in the city.

Monitoring Statewide Actions

Similar to the local measures described in this CAP, program evaluation should also include monitoring statewide actions addressing climate change; particularly those actions for which an emissions reduction was calculated and counted in the city's progress toward its reduction targets (see Table 2.4 in Chapter 2). The city should work with the Sustainability Coordinator to track implementation of statewide actions to ensure that estimated reductions actually occur. New statewide actions may also be established in the future that will result in additional local emissions reductions. These new actions should be incorporated into a future CAP revision, and would further reduce the burden on implementing local actions.

Reporting Schedule

The proposed Sustainability Coordinator and responsible departments and agencies will evaluate measure performance on the same schedule as the communitywide inventories following adoption of the CAP, and summarize progress toward the GHG reduction target in a report that describes estimated annual GHG reductions in 2020, achievement of performance metrics, participation rates (where applicable), and remaining barriers to implementation.

The proposed Sustainability Coordinator (or delegated city staff) will report progress on the CAP action items to decision-makers on an annual basis. Staff will deliver this report in conjunction with the state-required annual report to the City Council regarding implementation of the city's General Plan. The progress report will include a cursory assessment of progress and implementation of individual CAP measures, including how new development projects have incorporated relevant measures. The progress report will also identify measure gaps and recommend corrections.

Table 4.2
Measure Implementation Tracking Template

MEASURE E-7.1 SOLAR PHOTOVOLTAIC SYSTEMS

Facilitate the voluntary installation of solar PV systems on residential and nonresidential buildings.

Action	Responsibility	Phasing
A Consider reviewing/revising all applicable building, zoning, and other codes and ordinances to identify and remove potential regulatory barriers to the installation of solar PV or solar hot water systems in residential and nonresidential construction.	Planning Division; Building Division	Establish an internal target date or timeframe for implementing each action. (e.g., Short-Term, Medium-Term, Long-Term, or specific target years)
B Consider providing priority permitting for building-scale renewable energy projects.	Building Division; Sustainability Coordinator	
C Develop a comprehensive outreach campaign to increase voluntary participation in solar PV installation programs, including a directory of existing rebates/incentive programs, explanation of simple-payback calculations for solar PV systems, and technical assistance. Leverage existing solar PV informational materials from Energy Upgrade California, the California Solar Initiative, and PG&E.	Sustainability Coordinator	
D Develop informational materials about the benefits of PPAs offered through independent solar service providers. Post on the Solano County Sustainability Website, and make printed copies available at the Planning Department and Building Division counters.	Sustainability Coordinator	

Progress Indicators	Year	Tracking Mechanisms
625 single-family units install 4.5kW PV system 2.0 MW capacity installed on nonresidential and multi-family buildings	2020	Collect information from building permit data and analyze to gauge progress towards indicator targets: How many single family homes installed PV systems in each year, and at what total new capacity? What was the total new installed PV capacity for multi-family and nonresidential buildings in each year? What was the total new combined installed PV capacity in each year?
800 single-family units install 4.5kW PV system 3.8 MW capacity installed on nonresidential and multi-family buildings	2035	

PROGRAM EVOLUTION

To remain relevant, the city must be prepared to adapt and transform the CAP over time. It is likely that new information about climate change science and risk will emerge, new GHG reduction technologies and innovative municipal strategies will be developed, new financing will be available, and state and federal legislation will change. It is also possible that future inventories will indicate that the community is not achieving its adopted target. As part of the evaluations identified above, the city will assess the implications of new scientific findings and technology, explore new opportunities for GHG reduction, respond to changes in climate policy, and incorporate these changes in future updates to the CAP to ensure an effective and efficient program.

Project Consistency with CAP

The CAP identifies both mandatory and voluntary GHG reduction measures that would apply to different types of future projects.

MANDATORY MEASURES

For each of the following mandatory measures, the CAP either reinforces the implementation of current codes, ordinances, and state legislation, or directs changes to the city's codes and ordinances that would result in GHG reductions. All new projects would be required to comply with these codes and ordinances, as applicable:

- + Measure E-5.1: Building Shade Trees
- + Measure E-5.2: Parking Lot Shade Trees
- + Measure T-1.1: Pedestrian Environment Enhancements
- + Measure T-4.1: Alternative Fuel Vehicles
- + Measure T-5.1: Demand Management Program
- + Measure W-1.1: SB-X7-7
- + Measure SW-1.2: Commercial Recycling Program
- + Measure SW-2.4: Construction and Demolition Waste
- + Measure GI-1.1: Urban Green Forest Program

VOLUNTARY MEASURES

The remaining measures are essentially voluntary, relying on assumed levels of community participation to create communitywide GHG reductions. These measures will be tracked to ensure participation rates are reached and that the voluntary measures are being adequately applied to new and existing projects. If not, then additional, more aggressive actions will be necessary to correct shortfalls.

Funding Sources and Financing Mechanisms

This section describes potential funding sources and financing mechanisms that Suisun City could pursue to offset the financial burden of implementing the CAP measures described in Chapter 3. Each measure is accompanied by an analysis of costs and savings, and potential funding sources, financing strategies, and partnership opportunities.

The spectrum of public and private funding options for the measures outlined in this CAP is ever evolving. This section outlines viable funding options that are current, but could eventually become out of date. However, there are general sources of funding that provide the most up-to-date information, including:

- + U. S. Department of Energy (DOE)
- + Environmental Protection Agency (EPA)
- + US Department of Housing and Urban Development (HUD)
- + California Energy Commission (CEC)
- + California Infrastructure and Economic Development Bank
- + Metropolitan Transportation Commission (MTC)
- + Association of Bay Area Governments (ABAG)
- + Pacific Gas & Electric (PG&E)
- + Bay Area Air Quality Management District (BAAQMD)

COSTS + SAVINGS

The city is not the only entity bearing financial responsibility for implementing for CAP measures; there will be a private cost borne by residents and businesses for specific measures. In recognition of this, a costs and savings analysis was performed for each measure to evaluate the cost to the city, as well as potential costs and savings to residents or property owners. A summary of this analysis can be found in Chapter 3, with analytical background information provided in Appendix B. Generally, the implementation costs to the city for the creation of programs, which consist primarily of initial start-up costs and ongoing administration/enforcement costs, range considerably from negligible additional costs to on the order of several hundred thousand dollars.

Measures vary in the distribution of costs. Some measures require only funding from the city or other public entities, whereas others require that residents and businesses contribute. In nearly all measures that require some investment by residents or business owners, there are substantial long-term savings that will allow recuperation of initial investments, as well as other benefits such as improved air quality or publicly-owned spaces such as streetscapes, open spaces, rights-of-way, etc. There are also measures that require no private investment, but generate savings for the resident or business owner.

FUNDING STRATEGY

The CAP will require strategic public funding by the city, regional government agencies, and the state government for capital projects, incentives, outreach/education, and new regulations necessary to achieve the plan's objectives. To decrease costs and improve the plan's efficiency, actions should be pursued concurrently whenever possible. For example, the city should pursue land use and transportation-related actions together during upcoming General Plan updates and in the development of Specific Plans. The city could also look to address water- and wastewater-related measures with the related utilities and agencies (e.g., water districts); inter-agency collaboration will be paramount to the success of the CAP.

Funding sources have not been identified for all actions; however, numerous federal, state, and regional grants are available to assist with funding. More details on these programs and others follow in the subsequent sections.

Additionally, Suisun City should partner with nearby cities and jurisdictions to administer joint programs when feasible. As many businesses in Solano County and the

Bay Area are leaders in resource efficiency, renewable energy, and green infrastructure, potential opportunities exist to partner with the private sector to decrease implementation costs. Finally, many of the measures and actions have the potential to be self-financing if properly designed and implemented.

FUNDING AND FINANCING SOURCES

Transportation-Related Incentives and Programs

Many state and regional grant programs are available to fund transportation and infrastructure improvements. The programs listed below represent the current status of the most relevant of these programs. It is, however, important to evaluate the status of a given program before seeking funding, as availability and application processes are updated periodically.

MTC Livable Communities & Housing Incentive Program

The purpose of MTC's Transportation for Livable Communities (TLC) Capital and Planning Program is to support community-based transportation projects that bring new vibrancy to downtown areas, commercial cores, neighborhoods, and transit corridors by enhancing their amenities and ambiance and making them places where people want to live, work, and visit. TLC provides funding for projects that are developed through an inclusive community planning effort, provide for a range of transportation choices, and support connectivity between transportation investments and land uses.

As part of the TLC program, the Housing Incentive Program (HIP) rewards local governments that build housing near transit stops. The key objectives of this program are to:

- + Increase the housing supply in areas of the region with existing infrastructure and services in place
- + Locate new housing where non-automotive transportation options are viable transportation choices
- + Establish the residential density and ridership markets necessary to support high-quality transit service

HIP funds are intended for transportation capital projects that support TLC goals, such as pedestrian and bicycle facilities that connect housing projects to adjacent land uses and transit; improved sidewalks and crosswalks linking housing to a nearby community facility, such as a school or public park; or streetscape improvements that support increased pedestrian, bicycle, and transit activities and safety.

MTC Transit-Oriented Development Policy

To promote cost-effective transit, ease regional housing shortages, create vibrant communities and preserve open space, MTC has adopted a Transit-Oriented Development (TOD) policy that will be applied to transit extension projects in the Bay Area. MTC's TOD policy includes three key elements:

- + Corridor-based performance measures to quantify minimum thresholds of development around transit stations, based on the transit mode; higher thresholds with more capital-intensive modes, such as BART.

- + Aid for funding Station Area Plans (SAPs) to promote a jobs and housing balance, station access, design standards, parking and other amenities based on unique circumstances, and community character.
- + Creation of corridor working groups to bring together local government staff, transit agencies, county congestion management agencies (CMAs) and other key stakeholders along the corridor to help develop station area plans to meet MTC's corridor-wide land-use thresholds.

As this policy is still in development, the city should keep track of its progress and applicability to the CAP.

BAAQMD Transportation Fund for Clean Air

<http://www.baaqmd.gov/Divisions/Strategic-Incentives.aspx>

The state legislature has authorized BAAQMD to collect a \$4 surcharge on motor vehicle registration, to be used to fund clean air programs in the District' boundaries. These are known as Transportation Fund for Clean Air (TFCA) funds. By law, 40% of the TFCA funds are allocated to the jurisdiction of origin, and are programmed to qualifying projects by the Congestion Management Agency (CMA). BAAQMD releases updated programming regulations on a yearly basis. In the past, Solano BAAQMD funds have gone to projects such as the Solano Napa Commuter Information (SNCI) ridesharing program, electrical vehicle charging station installation, and signal light prioritization for transit vehicles near major transit hubs.

The TFCA program can fund a wide range of project types, including the purchase or lease of clean air vehicles; shuttle and feeder bus service to train stations; ridesharing programs to encourage carpool and transit use; bicycle facility improvements such as bike lanes, bicycle racks, and lockers; arterial management improvements to speed traffic flow on major arterials; smart growth projects; and projects to enhance the availability of transit information.

For 2014, BAAQMD estimates \$150,000 to \$300,000 of TFCA funds available for STA to allocate to qualifying projects. As with other fund sources, STA will evaluate all applications, but anticipates giving priority consideration to projects or programs that are contained in adopted STA countywide plans such as the Alternative Fuels, Bicycle and Safe Routes to Schools plans.

BAAQMD PEV Ready Program

http://www.bayareapevready.org/?doing_wp_cron=1394052429.8200039863586425781250

The Bay Area Plug-in Electric Vehicle Readiness Plan identifies the systems and resources that are needed to support accelerated PEV deployment, infrastructure, investment and readiness in the region. The Plan is the result of a community outreach process and collaboration among local and regional agencies, state and federal funding agencies, members of the California Plug-in Electric Vehicle Coordinating Council, staff from the electric vehicle industry, and other stakeholders that are pursuing numerous avenues to support PEV deployment in the nine-county Bay Area. The Plan highlights strategies and guidance to help the Bay Area achieve the goal of being "PEV Ready"—that is, well positioned to handle large-scale adoption of PEVs over the next 10 years (2013–2023).

The table below shows completed and active PEV readiness programs.

Project Title	Lead & Support Agencies	Incentive Funding		Match Funding	Charging Stations		DC Fast
		Source	Amount (Millions)		Residential Level 2	Nonresidential Level 2	
EVSE Home Charger Rebate Program (Completed June 2013)	ECOtality	BAAQMD	\$2.50	N/A	1,500	-	-
		DOE	\$5.00				
ChargePoint America (Completed June 2013)	Coulomb Technologies/ ChargePoint	DOE	\$1.17 ^a	\$1.71 ^a	-	330	-
Reconnect California (Completed August 2013)	Clipper Creek	CEC	\$2.30	\$1.20	-	65	-
Bay Area EV Corridor Project (Completed November 2013)	EV Communities Alliance, ABAG, Local Cities/ Counties	CEC	\$1.49	\$2.60	-	198 ^b	4
		BAAQMD	\$0.40		-		
Local Government EV Projects	Multiple	BAAQMD	\$0.15	\$1.94	-	50	-
		MTC	\$2.80		-		
eFleet: Car Sharing Electrified	City CarShare SFCTA	MTC	\$1.70	\$0.74	-	24 ^c	-
		BAAQMD BACAF/RFG	\$0.53		-		
Tribal Community Sustainable Transportation	Kashia Band of Pomo Indians	MTC	\$0.37	\$0.08	-	6	-
Businesses Deploying EV Infrastructure	Best Buy, McDonald's, Etc.	BAAQMD	\$0.34	\$0.75	-	178	-
DC Fast Charger Program	Various site hosts	BAAQMD	\$1.00	Varies by host	-	-	50
Electric Vehicle Charging Station Project	NRG (settlement w/ CPUC)	n/a	-	\$25.00 ^d	1,650 ^d (minimum)		55
Total (maximum)					2,490	1,511	109

^a Values are estimates based on the total project funding, match funding, and grant funding. ^b There were also 138 L1 charge points installed as part of this program. ^c City CarShare has been installing EVSE through the ChargePoint America program. These charging stations are not included in the total because they are already accounted for in the ChargePoint America line item. ^d To estimate the match funding for the Bay Area, we assumed about 25% of the settlement would be invested here. For the purposes of our EVSE estimates, we assume that 60% of the Make Readies to be deployed by NRG will ultimately be residential Level 2 EVSE and the other 40% will be nonresidential Level 2 EVSE.

ABAG / MTC FOCUS Program: Station Area and Priority Development Area Grants

<http://www.bayareavision.org/initiatives/prioritydevelopmentareas.html>

As outlined in MTC's Transit-Oriented Development Policy, future transit extensions in the Bay Area must be matched by supportive local land use plans and policies. To assist cities in meeting these goals, MTC launched a Station Area Planning grant program in 2005 to fund city-sponsored planning efforts for the areas around future stations and priority development areas identified by ABAG. These station-area and land-use plans are intended to address the range of transit-supportive features that are necessary to support high levels of transit ridership.

CALTRANS Planning Grants

Community Based Transportation Planning (CBTP) grants fund transportation and land use planning that promotes public engagement, livable communities, and a sustainable transportation system (e.g., mobility, access, and safety). The maximum award is \$300,000, and a local match of 20 percent of the grant request is required.

Safe Routes to Schools

Safe Routes to Schools is an international movement focused on increasing the number of children who walk or bicycle to school by funding projects that remove barriers to doing so. These barriers include lack of infrastructure, safety, and limited programs that promote walking and bicycling through education/ encouragement programs aimed at children, parents, and the community. In California, two separate Safe Routes to School

programs are available: the State program referred to as SR2S, and the federal program referred to as SRTS; both fund qualifying infrastructure projects.

Energy-Related Incentives and Programs

Many of the financing and incentive programs relevant to the CAP concern energy infrastructure and conservation. Some of these programs are tied to the ARRA economic stimulus package enacted by Congress in February 2009, and may no longer be available. Access to these funds will be available for a limited period, and the city should seek the most up-to-date information regarding the programs listed below.

Energy Upgrade California

www.energyupgradecalifornia.com/

www.acgreenretrofit.org/

Energy Upgrade California is a program under the State Energy Program (SEP), which is administered by the CEC. The purpose of the Program is to create jobs and stimulate the economy through a comprehensive program to implement energy retrofits in existing residential buildings. The Program will focus on deploying re-trained construction workers and contractors, and youth entering the job market to improve the energy efficiency and comfort of California's existing housing, creating a sustainable energy workforce in the process.

The Association of Bay Area Governments (ABAG) administers this region-wide energy retrofit program for residential home energy retrofits. Across the Bay Area, this program is targeted to achieve energy efficiency upgrades in up to 15,000 single family and 2,000 multi-family residences.

The program is designed to:

- + Establish sets of verifiable retrofit standards for energy efficiency and other green improvements that are easy for building owners and contractors to understand
- + Train contractors to implement these standards in their retrofit projects
- + Create quality assurance procedures to help ensure that retrofit work meets program requirements and performance expectations
- + Offer financing for eligible improvements through California FIRST
- + Bundle potential rebates and other incentives to make them more accessible to property owners
- + Conduct a countywide marketing and public outreach campaign to get the word out to property owners and building industry contractors about best practices for energy efficiency and green retrofits, as well as financing and incentive opportunities.

Flex Your Power

www.fypower.org

Initiated in 2001, Flex Your Power is a partnership of California's utilities, residents, businesses, institutions, government agencies and nonprofit organizations working to save energy. The campaign includes a comprehensive website, an electronic newsletter

and blog, and educational materials. The website provides regularly updated information on financial incentives and technical assistance for energy-efficient appliances, equipment, lighting and buildings. This information is available for residential, commercial, industrial and institutional consumers.

As existing programs evolve and new programs are created, Flex Your Power is a clearinghouse for information. Current incentives listed include:

- + The California Preschool Energy Efficiency Program (CPEEP) provides child care facilities with energy audits and retrofits.
- + The Enhanced Automation Initiative (EAI) pays large commercial and institutional customers to improve energy efficiency of existing building automation systems or energy management systems.
- + The School Energy Efficiency program (SEE) provides cash incentives for installing a variety of energy efficiency measures.
- + The Savings by Design program provides design assistance and financial incentives to commercial, industrial, institutional and agricultural building owners and design teams to promote energy efficient design and construction practices.

California Solar Initiative

www.gosolarcalifornia.org/csi/index.php

The California Solar Initiative (CSI) is the solar rebate program for California consumers who are customers of investor-owned utilities, such as PG&E. The CSI Program pays solar consumers an incentive based on system performance. For existing homes, existing or new commercial, agricultural, government, and non-profit buildings, this program funds both solar photovoltaics (PV), as well as other solar thermal generating technologies. Additionally, for homes and businesses, this program funds solar hot water systems. An additional rebate is available for single-family homes owned by low-income residents or multi-family affordable housing.

The CSI solar incentives differ by customer segment and size, and are intended to encourage high performing systems. There are two types of incentives available through the CSI program: Expected Performance-Based Buydown (EPBB) and Performance-based Incentives (PBI). EPBB is a one time, up-front payment based on an estimate of the system's future performance. For solar projects with a system larger than 30 kW, PBI are monthly payments for 5 years based on actual performance (output) of the system. The incentive rate is based on the incentive type—EPBB or PBI, and the relevant customer segment—residential, commercial or government/non-profit and current incentive step.

The CSI solar thermal hot water program will run for eight years, ending on December 31, 2017. To qualify of the CSI-Thermal rebate amounts differ by customers' system size, class (e.g., residential or commercial) and water heating fuel source (e.g., gas or electric).

California Feed-In Tariff

www.cpuc.ca.gov/PUC/energy/Renewables/hot/feedintariffs.htm

The California feed-in tariff allows eligible customer-generators to enter into 10-, 15- or 20-year standard contracts with their utilities to sell the electricity produced by small renewable energy systems -- up to 3 megawatts (MW) -- at time-differentiated market-

based prices. Time-of-use adjustments will be applied by each utility and will reflect the increased value of the electricity to the utility during peak periods and its lesser value during off-peak periods. These tariffs are not available for facilities that have participated in the California Solar Initiative (CSI), Self-Generation Incentive Program (SGIP), Renewables Portfolio Standard, or other ratepayer funded generation incentive programs, including net-metering tariffs.

For customers generating renewable energy not covered by the CSI or SGIP (e.g., biomass or geothermal) the feed-in tariff is applicable. If customers prefer a long-term contract at a fixed price over a financial incentive paid in the short term, feed-in tariffs may be a beneficial financing tool.

California Energy Commission Energy Efficiency Financing

<http://www.energy.ca.gov/efficiency/financing/index.html>

The California Energy Commission offers low-interest loans for public institutions to finance energy-efficient projects. Interest rates are currently at 3%. Projects with proven energy and/or capacity savings are eligible, provided they meet the eligibility requirements. Examples of projects include:

- + Lighting systems
- + Pumps and motors
- + LED streetlights and traffic signals
- + Automated energy management systems/controls
- + Building insulation
- + Renewable energy generation and combined heat and power projects
- + Heating and air conditioning modifications
- + Waste water treatment equipment

Loans for energy projects must be repaid from energy cost savings within 15 years, including principal and interest (approximately 13 years simple payback for the one percent interest rate funding and approximately 11 years simple payback for the three percent interest rate funding). Simple payback is calculated by dividing the dollar amount of the loan by the anticipated annual energy cost savings.

Only project-related costs, with invoices dated after loans are officially awarded by the Energy Commission at a Business Meeting, are eligible to be reimbursed from loan funds. The final ten percent of the funds will be retained until the project is completed. Interest is charged on the unpaid principal computed from the date of each disbursement. The repayment schedule is up to 15 years and will be based on the annual projected energy cost savings from the aggregated projects.

School Facility Program – Modernization Grants

www.opsc.dgs.ca.gov/Programs/SFPrograms/Mod.htm

The School Facility Program (SFP) provides funding assistance to school districts for the modernization of school facilities. The assistance is in the form of grants approved by the State Allocation Board (SAB), and requires a 40 percent local contribution. A district is eligible for grants when students are housed in permanent buildings 25 years old or older and re-locatable classrooms 20 years old or older and the buildings have not been previously modernized with State funds. The modernization grant can be used to fund a

large variety of work at an eligible school site including but not limited to air conditioning, insulation, roof replacement, as well as the purchase of new furniture and equipment.

Infrastructure State Revolving Fund Program

www.ibank.ca.gov/infrastructure_loans.htm

The Infrastructure State Revolving Fund Program provides direct low-cost loans for local governmental public infrastructure projects, including:

- + City Streets
- + City Highways
- + Environmental Mitigation Measures
- + Parks and Recreational Facilities
- + Public Transit
- + Solid Waste Collection and Disposal

Suisun City can consider applying for these low-interest loans to implement a wide range of CAP measures. Though some eligible projects would be considered public projects, other eligible projects are pertinent to specific measures in this CAP. In particular, the transportation- and waste-related measures could seek financing through this program. Loans are available in amounts ranging from \$250,000 to \$10 million per applicant for Tier 1 loans, and \$250,000 to \$2.5 million per applicant for Tier 2 loans (the tier system is based on evaluation of project impact; the greater the project impact, the higher the cap on available funds).

CPUC Self Generation Incentive Program

www.cpuc.ca.gov/PUC/energy/DistGen/sgip/

The CPUC's Self-Generation Incentive Program (SGIP) provides incentives to support existing, new, and emerging distributed energy resources. The SGIP provides rebates for qualifying distributed energy systems installed on the customer's side of the utility meter. Qualifying technologies include wind turbines, fuel cells, and corresponding energy storage systems.

Energy-Related Bond Financing

Qualified Energy Conservation Bonds (QECBs)

A Qualified Energy Conservation Bond (QECB) is a tax credit bond; issuers repay principal on a regular schedule, but generally do not pay interest. Instead, the holder of a QECB receives a federal tax credit in lieu of interest, which may be applied against the bond holder's regular and alternative minimum tax liability. The tax credit amount is treated as taxable interest income to the holder of the bonds. For example, if the tax credit amount is \$100 and the holder is in the 35 percent tax bracket, the credit provides a \$65 benefit to the holder. Under the current program, QECBs must be issued by the end 2010, though this program is likely to be renewed for the foreseeable future.

The proceeds of the QECBs can be used for one or more of the following "qualified conservation purposes":

- + Type I: Capital expenditures incurred for purposes of (i) reducing energy consumption in publicly-owned buildings by at least 20 percent,

(ii) implementing green community programs (including the use of loans, grants, or other repayment mechanisms to implement such programs), (iii) rural development involving the production of electricity from renewable energy resources, or (iv) any qualified facility eligible for the production tax credit under Section 45 of the IRS Code.

- + Type II: Expenditures with respect to research facilities and research grants to support research in: (i) development of cellulosic ethanol or other non-fossil fuels; (ii) technologies for the capture and sequestration of carbon dioxide produced through the use of fossil fuels, (iii) increasing the efficiency of existing technologies for producing non-fossil fuels; (iv) automobile battery technologies and other technologies to reduce fossil fuel consumption in transportation, or (v) technologies to reduce energy use in buildings
- + Type III: Mass commuting and related facilities that reduce the consumption of energy, including expenditures to reduce pollution from vehicles use
- + Type IV: Demonstration projects designed to promote the commercialization of (i) green building technology; (ii) conversion of agricultural waste for use in the production of fuel or otherwise; (iii) advanced battery manufacturing technologies; (iv) technologies to reduce peak use of electricity; or (v) technologies for the capture and sequestration of carbon dioxide emitted from combining fossil fuels to produce electricity
- + Type V: Public education campaigns to promote energy efficiency

Though some eligible projects would be considered public projects, other eligible projects are pertinent to specific measures in this CAP. In particular, the following eligible project types could have broad applicability in funding the measures in this CAP: Type II-(ii) green community programs, Type III mass commuting facilities, and Type V public education campaigns.

Other Climate-Related Programs

CAL FIRE Climate Change Program

Under the authority of the Urban Forestry Act, the Urban Forestry Program offers grants of over \$1 million dollars per year to plant trees, and over \$2.5 million for related forestry projects in urban communities throughout California.

CAL FIRE has identified five forestry strategies for reducing or mitigating GHG emissions, which are:

- + Reforestation to promote carbon sequestration
- + Forestland conservation to avoid forest loss to development
- + Fuel reduction to reduce wildfire emissions and utilization of those materials for renewable energy
- + Urban forestry to reduce energy demand through shading, increase sequestration, and contribute biomass for energy generation
- + Improved management to increase carbon sequestration benefits and protect forest health

These strategies were recognized by the Governor's Climate Action Team reports in 2006 and 2007, and by the Air Resources Board in its Climate Change Scoping Plan.

Climate Corps Bay Area

<http://www.climatecorps-bayarea.org/>

CCBA receives funding to place AmeriCorps members with local governments, public agencies and other nonprofits to work on energy and climate projects. Each CCBA member spends 11 months (1,700 hours of service) working on emissions reductions projects for their site organization. During this term of service, members will directly help communities to reduce their GHG emissions. Members cannot work directly on policy development or policy advocacy efforts. The goal for this program is for participating members to provide direct service to communities by working on projects that:

- + Realize measurable energy saving, clean energy and GHG reduction opportunities
- + Engage community members in activities that yield measurable energy and GHG benefits
- + Increase civic participation in community energy and climate efforts

Partnerships with Private Companies and Other Organizations

Numerous private companies provide renewable energy or green infrastructure. The success of the CAP depends in part on collaboration between these businesses and the city and public. For example, numerous companies are involved in developing electric plug-in auto charging station infrastructure throughout the Bay Area. PG&E also administers numerous energy efficiency and water conservation programs that the city can leverage and help advertise to residents. Solar companies will also be an important asset to the CAP, as the advent of the Power Purchase Agreement (PPA) enables businesses, residents, and the city to install solar panels and access solar power at no cost. Partnering with new and existing businesses, will enable the city to save money and provide the community with the most up-to-date green infrastructure.

Power Purchase Agreements

Renewable energy has become increasingly more accessible and cost-effective due to Power Purchase Agreements (PPAs). In a PPA, a private company or third party installs a renewable energy technology, often solar panels, at no cost to the consumer and maintains ownership of the installed panels, selling customers the power produced on a per kilowatt-hour basis at a contractually-established rate. The rate is lower than what customers pay their utility today, and increases at a fixed percentage (usually 2.5 to 4.0 percent) annually which is typically lower than the rate escalation by the utilities. In addition to installing the panels, the third party monitors and maintains the systems to ensure functionality. The contract period for a PPA is typically 15 years, at which point the third party will either uninstall the panels or sign a new agreement with the building owner. These agreements are ideal for demonstration projects implemented by the city and residents or businesses with interests in reducing the carbon emissions associated with energy consumption in their homes and businesses. This form of financing systems such as solar PV systems is becoming increasingly popular in the Bay Area, with a number of companies specializing in this form of financial transaction.

Energy Savings Performance Contracting

The basic concept of the energy savings performance contract (ESPC) is that an Energy Services Company (ESCO) guarantees the amount of energy saved, and further guarantees that the value of that energy would be sufficient to make the debt service payments as long as the price of energy does not fall below a stipulated floor price. The key benefits of the guaranteed savings include:

- + The amount of energy saved is guaranteed
- + The value of energy saved is guaranteed to meet debt service obligations down to a stipulated floor price
- + The city carries the credit risk
- + A smaller piece of the investment package goes to “buy” money
- + Tax-exempt institutions can use their legal status for much lower interest rates
- + ESCO carries only the performance risk

Typically, an ESPC project would have a simple payback of 10 years or less to allow for the cost of money and other fees to be included in the overall project payback. Lending institutions look for less than 15 years including all fees.

Typical projects include:

- + Energy management systems
- + Interior and exterior lighting
- + Boiler replacement/repair of steam systems
- + High-efficiency HVAC systems
- + LED traffic systems
- + Wastewater treatment plant pumps and motors

There are numerous ESCOs with reliable track records throughout the state. As evidenced by the above project types, the ESPC financing option would be most applicable to municipal operations-related measures in this CAP. If the city were interested in demonstration projects for particular energy savings technologies, this financing mechanism would apply.

Energy Efficiency Mortgages

www.hud.gov/offices/hsg/sfh/eem/energy-r.cfm

Energy Efficiency Mortgages can provide owners additional financing (whether at time-of-sale or upon refinancing) for energy efficiency improvements at discounted interest rates. Energy efficiency upgrades could be chosen that would allow owners to realize a net monthly savings. The goal is to provide capital for energy efficiency upgrades at a discounted interest rate. The Federal Housing Administration (FHA) offers an Energy Efficient Mortgage Loan program. This program helps current or potential homeowners significantly lower their monthly utility bills by enabling them to incorporate the cost of adding energy-efficient improvements into their new home or existing housing. This FHA program eliminates the need for homeowners who are interested in making their home more energy efficient to take out an additional mortgage to cover the cost of the improvements. The improvements can be included in a borrower’s mortgage only if the total cost is less than the total dollar value of the energy that will be saved during its

useful life. The program is available as part of a FHA-insured home purchase or by refinancing a current mortgage loan.

ENERGY STAR, a program under the DOE, offers another energy efficient mortgage option, though it is in its pilot phase and not currently available in California. This program is designed to encourage comprehensive energy efficiency improvements to new and existing homes by increasing the affordability and availability of energy efficiency mortgages for homeowners and homebuyers. These mortgages include the cost of energy efficiency investments in the loans themselves so that borrowers can pay for those investments over the life of their loans, as well as deduct the interest from their federal and State income taxes. One of the key benefits of an ENERGY STAR mortgage is that a borrower can finance energy-saving improvements to their home without paying more than he/she would for a typical mortgage. Following the completion of the pilot phase, this program will be extended to California.

Partnerships with Other Jurisdictions and Organizations

As Suisun City is a relatively small portion of Solano County in terms of population, partnering with neighboring jurisdictions is another key implementation strategy supporting the CAP. Various jurisdictions within Solano County could serve as potential partners in implementing the CAP strategies. The city should seek to partner with appropriate local governments, as identified in the CAP measure implementation sections, other potential partners including:

- + Solano Transportation Agency
- + Metropolitan Transportation Commission (MTC)
- + Association of Bay Area Governments (ABAG)
- + Pacific Gas & Electric (PG&E)
- + BAAQMD
- + Solano Economic Development Corporation
- + Solano Center for Business Innovation
- + Regional water districts
- + California ReLeaf
- + Sustainable Agriculture Education (SAGE)
- + United States Green Building Council (USGBC) – Northern California Chapter

Other Self-Financing Strategies

CAP measures include a range of incentives and regulations to change the community's behavior. It is important that the fees established in the CAP be self-financing. The money raised through the fees would then be used to implement the CAP measures determined to provide the best mitigation results. Suisun City will actively explore opportunities to establish programs that are self-financing and thus sustainable over the long term.

Prospective Funding: Cap and Trade Revenue

Governor Brown has proposed several hundred million dollars in funding for transportation programs that would reduce GHG emissions. These are summarized below. A copy of the Legislative Analyst Office's report with more details is at:

<http://lao.ca.gov/reports/2014/budget/overview/budget-overview-2014.pdf>.

- + **Sustainable Communities \$100 million** – The Strategic Growth Council will administer this program in coordination with various departments to implement Sustainable Communities Strategies that improve transit ridership, increase active transportation, provide affordable housing near transit, as well as preserves agricultural lands and supports local planning efforts that promote infill development. A priority will be given to projects in disadvantaged communities.
- + **Low Carbon Transportation \$200 million** – The California Air Resources Board will use these funds to accelerate the transition to low carbon freight and passenger transportation, with a priority for disadvantaged communities. These funds will be used to augment the Air Board's existing programs that provide rebates for zero-emission cars and vouchers for hybrid and zero-emission trucks and buses.
- + **Transportation Management Programs** – \$100 million for traffic management mobility projects, \$9 million for active transportation projects, and \$5 million for environmental mitigation.
- + **Proposition 1B Bond Funds** – \$793 million to support local transit operators.

Bay Area Integrated Regional Water Management Plan – Integrated Regional Water Management Implementation Grant Program

The Bay Area Integrated Regional Water Management Plan (BAIRWMP) program provides grants for a wide range of water resource, and water quality, stormwater management programs and projects that improve the Bay Area's reliable water supply, increase water conservation, and improve stormwater management, among other program objectives. BAIRWMP has prioritized grant requests that address Bay Area priorities related to climate change (mitigation and adaptation). The primary sources of funding for this program are state water bonds.

**SOLANO
City County Coordinating Council
Staff Report**

Meeting of. May 8, 2014

**Agency/Staff: Ann Edwards, Director,
Solano County Health and
Social Services Department**

Agenda Item No: V.3.

Title /Subject:

Receive an update from the Director of Solano County Health and Social Services Department on the implementation of the Affordable Care Act (administered through Covered California).

Background:

At the September 12, 2013 City County Coordinating Council meeting, a presentation was provided on the anticipated impacts of the 2010 Federal Patient Protection and Affordable Care Act (ACA). The 2010 ACA is intended to ensure that all Americans have access to affordable, quality healthcare. Prior to enactment of the ACA, many Solano County residents were unable to afford the high cost of health insurance, were denied health insurance due to pre-existing conditions, and were ineligible for or unable to access the complex public healthcare system. Lack of health coverage limits access to care and leads to higher acuity rates and excessive use of emergency rooms; the end result is more expensive healthcare and poorer health outcomes. While the United States spends at the highest amount per capita on healthcare of the industrialized nations, health outcomes are well below those of other countries spending less. The Federal Medicaid and Medicare programs cover millions of Americans who meet the income, age, or medical criteria to be eligible for care under these programs and cost billions of dollars in Federal and State funds, but there are many individuals who are not eligible and, due to cost, do not have or receive healthcare until it is urgent or an emergency. The ACA is intended to expand eligibility for Medicaid beginning January 1, 2014 and to offer affordable health insurance for those who are not eligible for federal/state programs.

Discussion:

The Affordable Care Act (ACA) expanded eligibility for Medi-Cal, and incorporated significant changes in both the operation and funding of the program. On October 1, 2013, Solano County established the Center for Healthcare Options and Insurance Coverage Enrollment (CHOICE) call center to accept calls transferred from Covered CA, the State's health benefit exchange. The transferred calls are individuals who were identified as potentially Medi-Cal eligible, however, CHOICE staff handles all enrollments once the call was transferred, whether they were actually Medi-Cal eligible or instead eligible for a Covered CA. subsidized or unsubsidized plan.

- From October 1, 2013 to March 31, 2014, the CHOICE team answered over 1,850 calls from Covered CA, about 1,600 for Solano County residents, and over 250 for residents of other counties, as part of a mutual backup process between counties. Other counties handled 44 calls for Solano County residents.

- The Covered CA Board set the expectation that transferred calls would be answered within 30 seconds; the CHOICE team has met that goal on 100% of calls from October 2013 through February 2014, and on 99.5% of calls in March 2014, for an overall average of 99.9% of calls.
- About 31% of these calls resulted in the initiation of a new Medi-Cal application, about 27% in a change to an existing Medi-Cal case, and about 4% resulted in an application for subsidized health coverage through Covered CA.

In addition to calls transferred by Covered CA, Solano County developed a local health care reform telephone line, which received over 13,500 calls from October 2013 through March 2014. Calls were answered Mondays through Fridays from 8 AM to 8 PM, and Saturdays from 8 AM to 6 PM during the open enrollment period (these hours changed effective April 2014). The calls have been answered, on average, in 7 seconds, by our clerical team, with an abandonment rate of 5%. Callers are then transferred to the appropriate case worker to assist them, depending on whether they are new applicants or have an existing case.

Currently, the CHOICE team is working on processing thousands of pending applications referred by Covered CA. These applications originate from online applications, paper applications, or calls that were not initially screened as being potentially Medi-Cal eligible, but later identified as such. Staff is working to process these as quickly as possible, but is hampered by ongoing system issues with CalHEERS, the Covered CA system.

The local offices are also experiencing increased activity from Medi-Cal applications in person and using the online MyBenefitsCalWIN application system, many include duplicate applications from individuals who applied through Covered CA but ran into problems or found the process confusing. From December 1, 2013 to April 1, 2014 the number of Medi-Cal recipients in Solano County increased from 74,000 to 89,100 which include 6,400 which transitioned from County Medical Services Program (CMSP).

Recommendation:

Receive an update from Ann Edwards, Director, Solano County Health and Social Services Department, on the implementation of the Affordable Care Act in Solano County.

Attachment(s):

1. ACA Implementation Update (PowerPoint)

Affordable Care Act Update

City County Coordinating Council

May 8, 2014

Ann Edwards

Health & Social Services (H&SS) Director



No Wrong Door

Apply however you choose!



- **In person at Solano County Office (Monday – Friday 8 AM – 5 PM)**
 - Assisted by County eligibility staff
 - Vallejo: 365 Tuolumne St
 - Fairfield: 275 Beck Ave
 - Vacaville: 1119 E. Monte Vista Ave



- **Online**
 - Through MyBenefitsCalWIN (www.mybenefitscalwin.org)
 - Through Covered California website (www.coveredca.com)



- **By Phone (Monday-Friday 8 AM – 6 PM, Saturdays 8 AM – 5 PM)**
 - To Solano CHOICE Call Center at 707-784-8555
 - To Covered California at 800-300-1506



- **Mail**
 - Send to Solano County at PO Box 12000, Vallejo, CA 94590
 - Send to Covered California



- **Through community based Certified Enrollment Counselors or Insurance Brokers**
 - Solano Coalition for Better Health 800-978-SKIP (7547)
 - Others listed on Covered California website



Implementation Challenges

- Delays in Federal guidance; continued policy changes
- Delays in critical State decisions – policy and technical
- Technical issues
 - Covered CA website downtime
 - Delay in interfacing with county systems
 - System and programming errors
- Policy and technical decisions from State come piecemeal
 - Staff exhausted trying to keep up with current information
 - Customers and community confused and running out of patience
- End of open enrollment = volume spike

Calls Transferred from Covered CA

- Through March 31, 2014, the Center for Healthcare Options and Insurance Coverage Enrollment (CHOICE) team eligibility workers handled 1,856 calls transferred from Covered CA
 - 99.9% of calls answered within the 30 second time limit
 - Solano County has handled 97% of the calls for Solano County residents, plus over 250 calls for other counties, as part of a cross county backup process
 - About 31% of calls resulted in a new Medi-Cal application
 - About 27% of calls resulted in a change to an existing Medi-Cal case
 - About 4% of calls resulted in a Covered CA application for a tax subsidy
- CHOICE clerical staff handled 12,845 calls to Solano's enrollment line (784-8555) through March 31, 2014



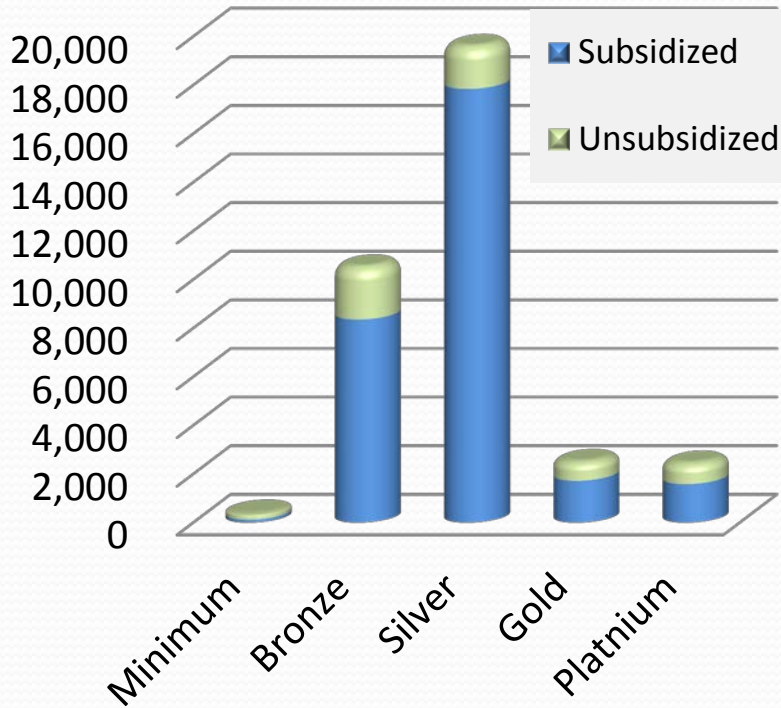
Impact on Solano County residents

- Over 74,000 Medi-Cal recipients (excludes CMSP) as of December 1, 2013
 - Anticipated 5,800 newly eligible under ACA + 3,100 currently eligible and not enrolled
- Over 7,900 CMSP recipients as of December 1, 2013
 - Over 6,400 individuals (81%) transitioned from Path2Health to Medi-Cal without having to re-apply
 - Over 300 former CMSP recipients have applied for Medi-Cal or subsidized plans
 - Almost 150 eligible for Medi-Cal
 - About 80 eligible for Covered CA plans
 - About 90 pending
- 89,100 Medi-Cal recipients as of April 1, 2014 (includes converted cases from CMSP)
 - Over 5,500 cases (can be family groups) pending as of the end of March 2014 – nearly double the number from March 2013
 - About 4,000 individuals referred by Covered CA – currently reviewing and consolidating duplicates

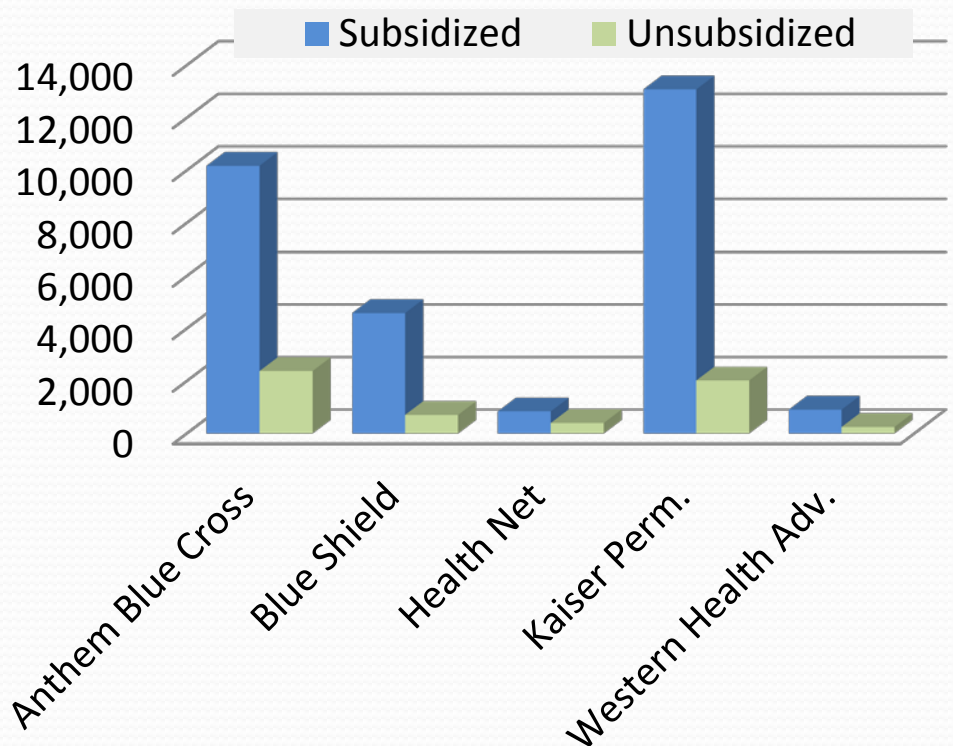
Covered CA Regional Enrollment Data

Through February 28, 2014, the nine county Bay Area region had 194,879 people enrolled in a subsidized or non-subsidized Covered CA health plan, 218% of the original projection, the highest in the State

Enrollment by Metal Tier



Enrollment by Carrier



Breakdowns by plan type (metal tier) and carrier shown for Marin, Napa, Solano, and Sonoma counties

A Note on Timing

- First ACA open enrollment period was Oct. 1, 2013 – Mar. 31, 2014
 - Will be shorter in future years
 - Exceptions for life changes, like changing jobs or moving out of current coverage area
 - Next open enrollment period will begin in November 2014
- Applications for Medi-Cal and CMSP can be submitted at any time throughout the year; there is no open enrollment period
 - When eligibility is verified, coverage is generally effective the 1st of the month in which the applicant applied.

SOLANO
City County Coordinating Council
Staff Report

Meeting of: May 8, 2014
Agenda Item No: V.4.

Agency/Staff: Stephen Pierce, County of Solano

Title /Subject: Receive an update on the progress of the Moving SOLANO Forward project, an Office of Economic Adjustment-funded effort to develop a strategy and recommendations for an implementation plan to further diversify the Solano County economy.

Background: On May 9, 2013, the project team for Moving SOLANO Forward presented the framework for an economic diversification study project and provided a progress update on January 9, 2014. The study represents a continuation of the collaborative efforts of the County and the seven cities to find ways to expand and enhance local economic activity. The Moving SOLANO Forward effort stems from a May 2010 discussion at the CCCC on potential next steps in developing countywide economic development strategies.

Given the fiscal distress local governments were experiencing at the time, one of the next steps was to seek outside sources of funding to assist in the development of these strategies. In pursuit of this goal, the Solano EDC explored potential funding options from the Office of Economic Adjustment (OEA). The OEA is a function of the Office of the Assistant Secretary of Defense that focuses on assisting communities with military installations. While the organization is more known for helping communities after base closures, the OEA can also help communities with local economies that have significant Department of Defense expenditures. Solano County qualified as a community with economic dependence on a military installation.

In May 2012, the Office of Economic Adjustment (OEA) conducted a site visit as a follow-up to a request from the Solano EDC for assistance in conducting an economic diversification study. This resulted in the discovery that a public entity would be required to pursue any grant options; the County took the lead in the grant application process. In January 2013, the Board of Supervisors accepted a \$369,860 grant from OEA. In March 2013, the Board awarded a contract to Economic & Planning Systems to conduct the economic diversification study project. The other members of the project team include the Center for Strategic Economic Research (CSER) and the Solano Economic Development Corporation (EDC).

Discussion: The attachment describes the Moving SOLANO Forward project deliverables and upcoming events and milestones. Key deliverables include the release of the draft report by June 2014 and presentation of the findings to the Board of Supervisors on July 22, 2014, City County Coordinating Council on August 14, 2014 and at a Solano Economic Development Corporation breakfast on August 27, 2014.

Recommendation: Receive an update on the Moving SOLANO Forward economic diversification study project.

Attachments:

- Attachment A: Moving SOLANO Forward Project Update

Moving SOLANO Forward Project Update

As of April 30, 2014

Moving SOLANO Forward is an ambitious effort to develop a countywide strategic approach to further diversify the economic base of Solano County, which will enable residents and businesses to thrive and prosper. This comprehensive economic diversification study project is funded by the Department of Defense's Office of Economic Adjustment, and builds upon the Shared Economic Framework that emerged from past collaborative efforts to understand and move the economy forward.

The project was launched in June 2013 with a Stakeholder's Symposium that introduced the project. Since that time the project team has been meeting with public and private sector interests to develop a comprehensive analysis of the local economy and an action plan that outlines options on how the public and private entities across the county can further diversify the local economy. The original grant period was scheduled to conclude in June 2014; however, an extension was granted by the Office of Economic Adjustment to allow additional time for the presentation of the Economic Diversification Study report.

Since the update provided in January 2014, the Moving SOLANO Forward project team has met with both the Partners Group and the Review Committee in February and April to explore the economic development ecosystem in Solano County, discuss an update of the viable target industry clusters, and prioritize economic diversification goals and implementation objectives. As part of this process, the project team released the following technical memoranda for review and comment:

- Regional Economic Development Ecosystem Analysis on March 3, 2014
- Demographic and Economic Profile and Real Estate Analysis on March 5, 2014
- Strengths, Weaknesses, Opportunities and Threats Analysis on April 2, 2014
- Viable Industries and Cluster Analysis on April 8, 2014

These technical memoranda are available for review online at www.movingsolanoforward.com and will be integrated into the **Economic Diversification Study** report that will be available in June 2014. The report will use the following vision and objective to frame the economic diversification goals and the subsequent strategies to implement those goals.

Vision: The Solano County region will work collaboratively to create a diverse and robust economy focused on city-driven growth, desired industry cluster growth in targeted locations, viable agricultural uses, and strengthened recreational assets that expand economic opportunities for employers and residents.

Objective: Identify and prioritize strategic public investments to induce private-sector investments to diversify and grow the county's economy by identifying key issues and opportunities; aligning interests and resources; and pursuing high-priority initiatives.

The project team will meet with the Partners Group and Review Committee in May 2014 to finalize the economic diversification goals, strategies and recommended implementation actions that will be contained in the final Economic Diversification Study report. This document will serve as the basis for an economic diversification strategic approach for the county. Based on stakeholder feedback and the consultants' professional expertise, the report will contain the following components:

- **Economic Development Vision, Objectives and Strategies.** The report will present a guiding vision, goals and objectives, and strategies to increase economic diversification in the county. The strategies will focus on elements such as targeted industries for attraction and expansion, elements necessary to address improved retention; ways to enhance entrepreneurship; and geographical locations that present the greatest development potential.

- **Implementation Plan.** The recommendations in the implementation plan will focus on measurable actions, timelines, responsible parties, potential partnerships, and policy development. The implementation plan will contain strategies, recommendations, and tactics that help define a path for the county to meet its objectives, incorporating quantitative and qualitative performance measurements as a means for tracking data.
- **Technical Data & Support Documentation.** The technical memoranda released to date and other supporting information will be incorporated seamlessly as chapters and appendices within the Economic Diversification Study report.

Upcoming Events & Milestones

STAKEHOLDER MEETINGS			
Meeting	Date/Time	Location	Topics
Partners #5	May 20, 2014 12:00-2:30 PM	Conference Room B Solano County Events Center 601 Texas St., Fairfield, CA	<ul style="list-style-type: none"> • Preliminary economic diversification study
Review #4	May 29, 2014 12:00-2:30 PM	County Administration Center, 1 st Floor Multipurpose Room 675 Texas St., Fairfield, CA	<ul style="list-style-type: none"> • Preliminary economic diversification study
PRESENTATION OF THE REPORT			
Board of Supervisors	July 22, 2014 9:00 AM	Board Chambers County Administration Center 675 Texas St., Fairfield, CA	<ul style="list-style-type: none"> • Presentation of the Economic Diversification Study Report
City County Coordinating Council	Aug. 14, 2014 7:00 PM	Solano County Water Agency, Berryessa Room 810 Vaca Valley Parkway Vacaville, CA	<ul style="list-style-type: none"> • Presentation of the Economic Diversification Study Report
Solano EDC Breakfast	Aug. 28, 2014 7:30-9:00 AM	Hilton Garden Inn 2200 Gateway Court Fairfield, CA	<ul style="list-style-type: none"> • Presentation of the Economic Diversification Study Report