CITY OF ALBANY

CLIMATE ACTION PLAN

April 2010

AECOM

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APRIL 2010

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Acronyms and Abbreviations

AB	Assembly Bill
ABAG	Association of Bay Area Governments
ARB	California Air Resources Board
ATMA	Albany Transportation Management Association
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
CACP	Clean Air Climate Protection
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CBTP	Community Based Transportation Planning
CCA	community choice aggregation
CCAR	California Climate Action Registry
CDD	Community Development Department
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CGBC	California Green Building Code
CIP	Capital Improvement Projects
CIWMB	California Integrated Waste Management Board
CO_2	carbon dioxide
CRA	California Resources Agency
CSA	Community-Supported Agriculture
CSI	California Solar Initiative
DOE	U.S. Department of Energy
EBMUD	East Bay Municipal Utility District
EIA	Energy Information Administration
EO	Executive Order
ET	evapotranspiration

FAR	floor area ratio
FHWA	Federal Highway Administration's
FIRST	Financing Initiative for Renewable and Solar Technology
GHGs	greenhouse gas emissions
HPMS	High Performance Monitoring System
I-80	Interstate 80
ICLEI	Local Governments for Sustainability
IPCC	United Nations International Panel on Climate Change
kWh	kilowatts hours
lb CO_2/kWh	pound of CO_2 per kilowatt
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design
LID	Local Improvement District
MFR	multi-family
MMT CO_2e	million metric tons carbon dioxide equivalent
MPO	Metropolitan Planning Organizations
MT CO_2e	metric tons of carbon dioxide equivalent
MTC	Metropolitan Transportation Commission
NREL	National Renewable Energy Laboratory
PG&E	Pacific Gas and Electric
PPA	Power Purchase Agreement
ppm	parts per million
PTOD	Pedestrian- and Transit-Oriented Development
PV	photovoltaic

RPS	Renewable Portfolio Standard
SB	Senate Bill
SCS	Sustainable Communities Strategy
SFR	single-family
TFCA	Transportation Fund for Clean Air
TLC	Transportation for Livable Communities
VMT	vehicle miles travelled

Preface

The Climate Action Plan

Albany's Climate Action Plan (CAP) was prepared in 2008–2009 by City staff and consultants, with considerable input from the public, and grant support from the Bay Area Air Quality Management District and the Alameda County Waste Management Authority and Source Reduction and Recycling Board (StopWaste.org).

The CAP consists of a summary chapter and four technical chapters. The Summary Chapter defines climate change and its potential effects, outlines the actions the State and City are taking to address climate change, and describes how residents and business owners can participate in greenhouse gas (GHG) reduction efforts. The technical chapters detail the City's strategy to be consistent with applicable state regulation and provide guidance to City officials and departments charged with implementing the plan. They consist of the following:

- **GHG Baseline, Projections, and Targets** – This chapter presents what we know regarding Albany's current GHG emissions, projected future emissions for 2020 and 2050, and leadership action by the City Council to establish a reduction target.
- **Climate Action Strategies** – This chapter proposes strategies and measures the City can take to achieve its emissions reduction target.
- **Implementation** – This chapter discusses how the City will monitor the Climate Action Plan to ensure that the proposed strategies and measures achieve reduction targets, and describes available funding strategies.
- **Public Participation** – This chapter describes the role public participation played in the formulation of the CAP. The chapter specifically discusses the outreach methods used and summarizes the input provided.

Public Input

Albany residents actively participated in the formulation of this CAP and were vital to its success. Community members provided valuable input that was used to select GHG reduction measures and assisted in the review and revision of the Plan. Community support for the CAP is critical to its success, and community members will continue to take an active role to both implement the plan and monitor its effectiveness over time.

A variety of outreach methods were used during plan preparation including meetings with Albany's Sustainability Committee, a web-based community survey, and workshops at Green Albany Day 2009. Draft measures were also made available through the City's website to interested parties.

The Sustainability Committee was the principal body for identifying, confirming, and validating community concerns and desires, and functioned as a conduit between the City, residents, property owners, and the business community in the formulation and review of Climate Action Plan strategies and measures. The group analyzed a full spectrum of community issues, opportunities, and challenges. Prior to release of the Administrative Draft CAP, the Sustainability Committee met four times to review and discuss: 1) the objectives of the CAP work program; 2) preliminary results of the community survey; 3) the GHG inventory, projections, and reduction targets; and 4) draft GHG reduction strategies and measures. Following release of the Administrative Draft CAP, the Sustainability Committee met twice to review the draft Plan. The committee provided valuable feedback that was incorporated into the Public Draft CAP. The City sponsored the first of two online climate action surveys between October 2008 and June 2009 to provide input for the CAP. City staff also

sponsored info tables at the Senior Center and Community Center and a booth at the City's 4th of July celebration to distribute paper copies of the survey. Over 160 responses to the survey were received. The survey consisted of 21 questions regarding transportation choices, home and business energy use, community shopping and services, renewable energy, water conservation, waste reduction, and sea level rise. The survey also asked residents to identify the level of support they would offer the City with regard to implementing mandatory requirements versus incentive-based programs to achieve GHG reductions. A second online survey was released with the public review draft of the CAP to assess public support for specific measures included in the plan.

The City conducted two community workshops in conjunction with Green Albany Day on May 17, 2009. The workshops focused on proposed GHG reduction strategies and measures to be contained in the Draft CAP. The workshop also allowed the public to provide comments on the draft strategies and measures.

Chapter I
Introduction

MAYOR'S STATEMENT

Dear Albany Residents,

I am pleased to introduce the City of Albany's Climate Action Plan (CAP). The CAP is the result of a 2-year community planning process to identify opportunities for Albany to reduce its carbon footprint. Action to reduce the impacts of climate change is imperative to ensure a quality of life for future generations.
I encourage you to support the community as we embark upon the further greening of Albany, and serve as local leaders against the global climate change issue.

It has become quite evident that Albany takes the threat of climate change seriously, with over 150 responses to our online climate change survey, input at public meetings, and important input at the climate action planning workshops held at the City's 2009 Green Albany Day. Many of you have contributed your thoughts and ideas concerning measures the city and residents should take to reduce greenhouse gas emissions (GHGs), including enhancing local transportation, making streets more bicycle- and pedestrian-friendly, incentivizing energy efficiency and green building, creating solar programs, preserving open space, low impact development, and continuing our comprehensive recycling and urban forestry programs. This valuable input from residents has informed the CAP so that it is truly a document of our common interests.

I am certain that with the guidance of this climate action plan Albany will continue to make meaningful changes in our everyday lives and operations to reduce our carbon footprint. I look forward to working together toward a truly "Green" Albany.

Sincerely,

Joanne Wile
Mayor, City of Albany

Purpose and Scope of the Climate Action Plan

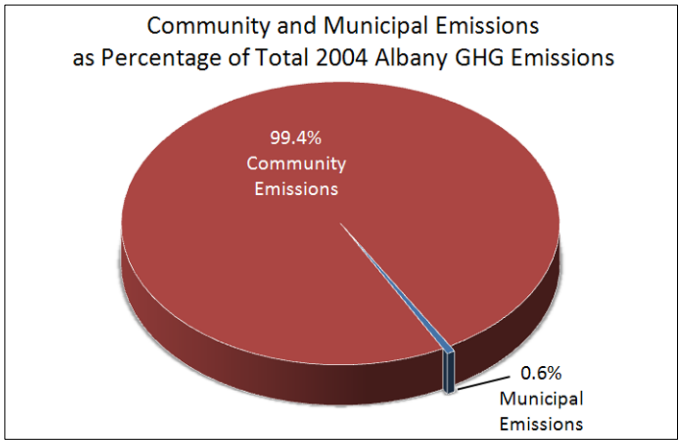
Purpose

The CAP outlines a course of action for the City and the Albany community to reduce greenhouse gas (GHG) emissions and combat global climate change. The CAP has been designed to support three primary functions:

- provide clear guidance to City staff regarding when and how to implement key provisions of the plan,
- inspire residents and businesses to participate in community efforts to reduce GHG emissions, and
- demonstrate Albany's commitment to comply with State GHG reduction efforts.

Scope

The CAP is intended to reduce GHG emissions generated in municipal and community-wide activities. GHG reductions will be achieved in the areas of building and community energy use, transportation and land use, waste reduction and diversion, water conservation, and green infrastructure enhancement. The plan contains strategies, objectives, measures, and actions that will direct the City's reduction efforts.



The timeframe for the CAP extends from the date of adoption through December 31, 2020. Over the coming decade, the City will facilitate considerable changes - both within its operations and throughout the community.

The Challenge

What is the Greenhouse Effect?

The greenhouse effect is the warming of our climate that results when the atmosphere traps heat radiating from Earth toward space. Certain gases in the atmosphere act like the glass in a greenhouse – allowing sunlight to pass into the greenhouse, but blocking the heat from escaping into space. The gases that contribute to the greenhouse effect include water vapor, carbon dioxide (CO_2), methane, nitrous oxides, and chlorofluorocarbons (National Aeronautics and Space Administration 2009). While the greenhouse effect is essential to life on earth, human-generated emissions from burning fossil fuels, deforestation, and other causes have increased the concentration of greenhouse gases GHGs to dangerous levels.

"The Debate is Over"

At the 2005 United Nations World Environment Day Conference, California Governor Arnold Schwarzenegger declared, *"…the debate is over. We know the science. We see the threat. And we know the time for action is now."* In these four sentences, the governor succinctly summarized the extensive research, findings, and recommendations of the world's leading climate change scientists. These experts have identified three critical factors related to the earth's changing climate:

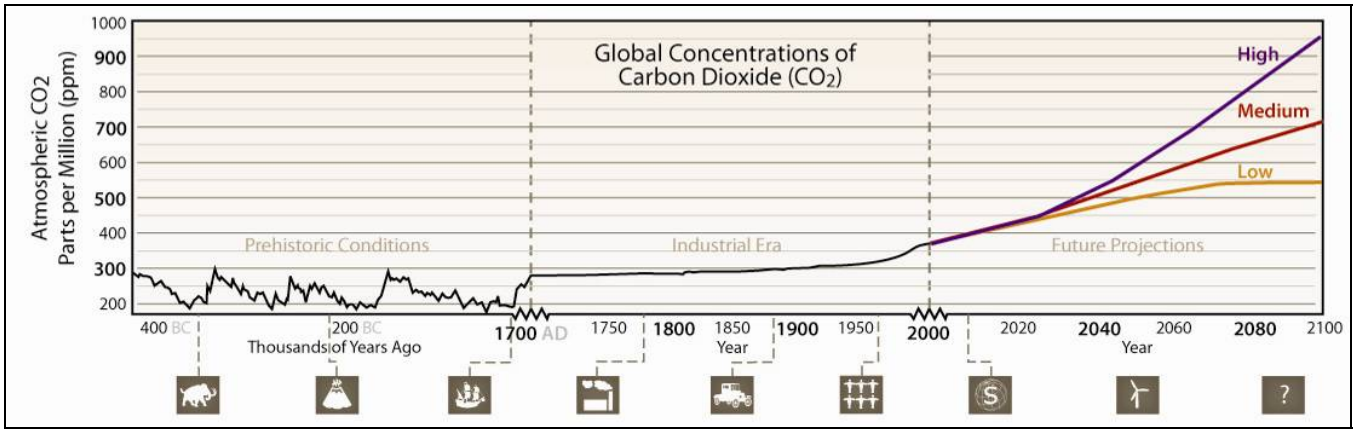
- atmospheric GHG concentrations have increased dramatically since 1750 and now far exceed pre-industrial values,
- global average temperatures have increased markedly over the last 100 years because of the increased GHG concentrations, and
- human-induced GHG emissions are the primary driver behind the global warming process.

"Dangerous Climate Change" - *The most serious consequences of global warming might be avoided if global average temperatures rise by no more than 2.5 °F above current levels.*
- UK Department of Environment, 2004

Global Emissions

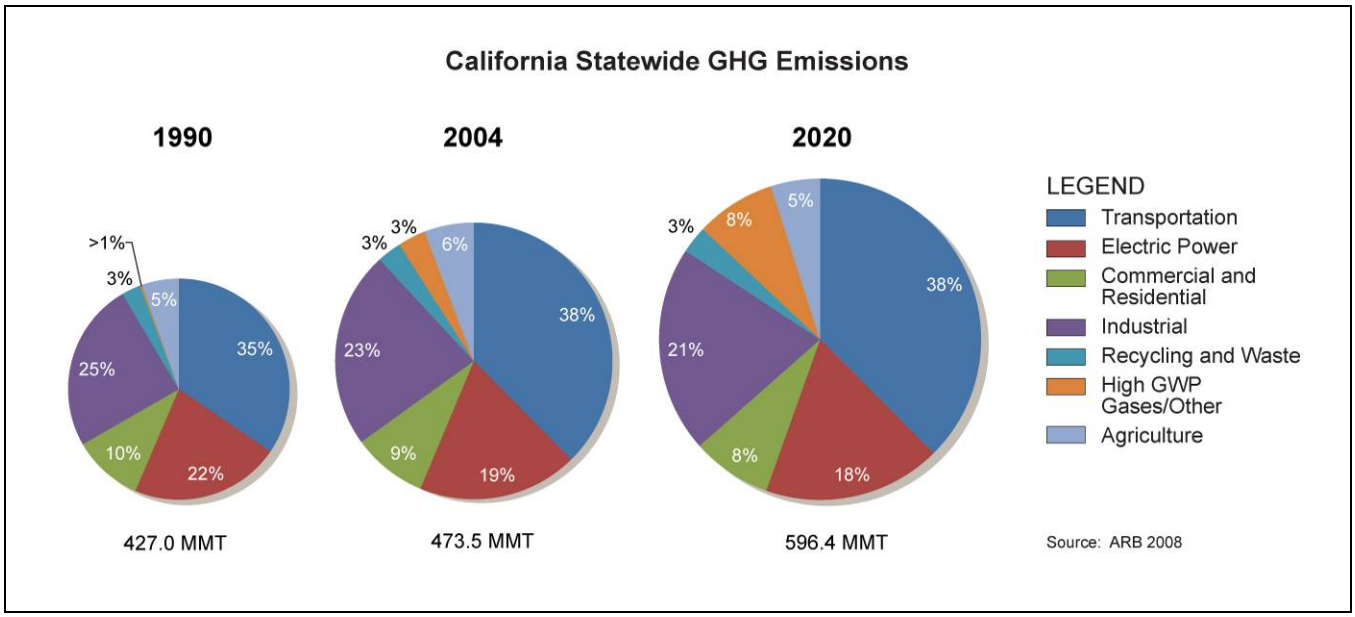
Data describing atmospheric GHG concentrations over the past 800,000 years demonstrates that concentrations of CO2, the main GHG, have increased dramatically since pre-industrial times, from approximately 280 parts per million (ppm) to approximately 353 ppm in 1990 and approximately 379 ppm in 2005.

In 2000, the United Nations International Panel on Climate Change (IPCC) described potential global emission scenarios for the coming century. The scenarios vary from a best-case characterized by low population growth, clean technologies, and low GHG emissions; to a worst-case where high population growth and fossil-fuel dependence result in extreme levels of GHG emissions. While some degree of climate change is inevitable, most climate scientists agree that in order to avoid dangerous climate change, atmospheric GHG concentrations need to be stabilized at 350–400 ppm.



California GHG Emissions

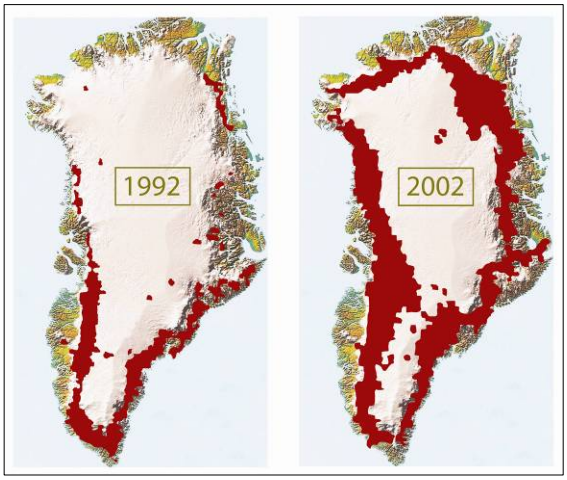
Between 1990 and 2004, California's annual GHG emissions increased 11% from 427 million metric tons carbon dioxide equivalent (MMT CO_2e) emissions to 474 MMT CO_2e. If emissions continue to increase at business-as-usual rates, statewide emissions are expected to increase to approximately 600 metric tons by 2020, a 40% increase above 1990 levels. In order for the State to participate in global efforts to avoid dangerous climate change, California's GHG emissions need to be reduced to at least 1990 levels by 2020 and 80% below 1990 levels by 2050.



Cause for Concern

Global Effects of Climate Change

Observations from around the world demonstrate that the earth's global average air and ocean temperatures have steadily increased over the past 100 years. Between 1995 and 2006, all but one of the years ranked as the warmest year on record. In addition to increased temperatures, other evidence indicates that our planet's climate is warming. Rapid levels of glacial melt, considerable decreases in the extent of Northern Hemisphere sea ice, shorter freezing seasons, and decreases in snowpack quantities are a few of the most prominent changes.



Glacial Melt Extent in Greenland

Increasing temperatures threaten to severely impact the world's ecological, social, and economic systems. Notable examples of potential effects include:

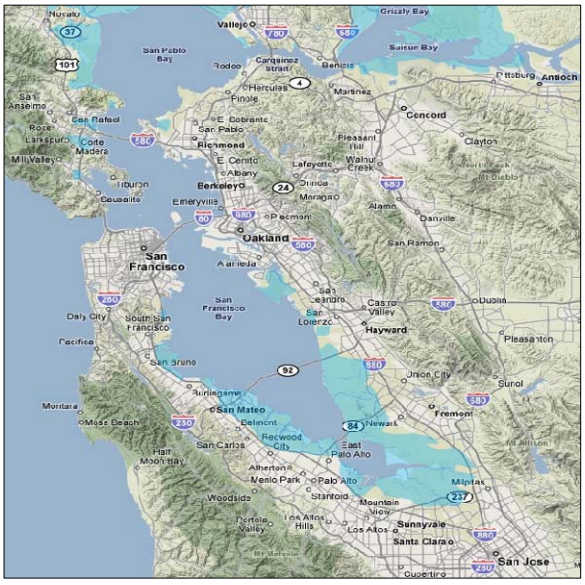
- More frequent and intense extreme weather events (i.e., hurricances)
- Increased stress on water resources
- Coastal areas at greater risk from sea-level rise and storm surges
- Reduced food security
- Increased threats to human health (i.e., mosquito-borne diseases)
- Ecosystem loss or degredation
- Economic and geopolitical disruption

Effects of Climate Change in Albany

To date, the implications of climate change have primarily been examined at global and regional scales. Due to the scale of current models, it is difficult to identify the specific effects that climate change may have on an individual city. That said, climate change effects on sea level and water supply have been examined at a scale directly relevant to Albany.

Sea Level Rise: In 2008, the United States Geological Survey conducted a detailed study of the potential impacts of sea level rise to coastal portions of the San Francisco Bay Area. The study projects that in 2100, approximately 110 acres within Albany could be inundated if a 4.5 foot increase in sea levels were to occur. The increase in base sea level will not only inundate shoreline areas directly, it will also exacerbate coastal flooding by increasing both flood frequency and floodplain area. Using data from this USGS study, the next steps in strategic planning for sea level rise are to identify resources at risk and develop management strategies. The City, in partnership with property owners, BCDC, and other agencies, should identify properties and resources susceptible to sea level rise to prioritize management strategies. The City should then develop management strategies that meet City and regional protection, adaptation, and resource enhancement goals.

4.5' Sea level rise in SF Bay Area



Water Supply: The East Bay Municipal Utility District (EBMUD) 2040 Water Management Plan examines the potential effects of climate change on both water supply and on the utility's extensive storage and distribution infrastructure. EBMUD water supplies are most vulnerable to a potential shift in the timing of springtime runoff from the April-to-July period to winter months, and to decreases in annual runoff volumes.

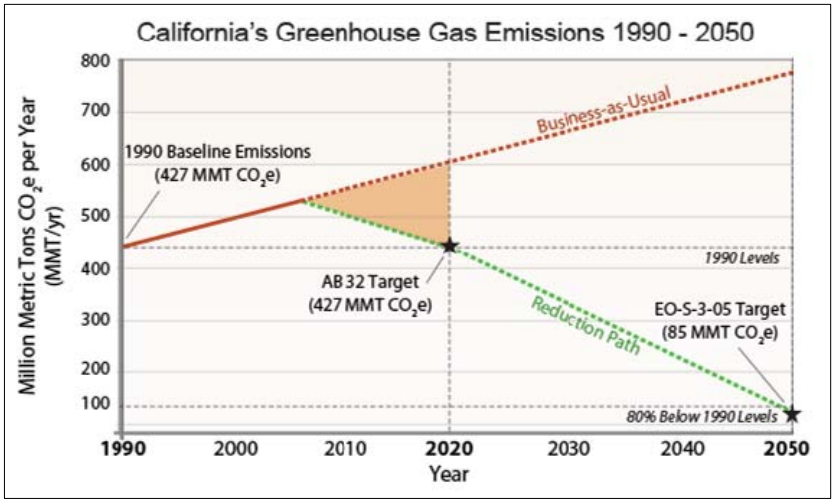
Leadership

California Regulatory Context

California has adopted a wide variety of regulations aimed at reducing the State's GHG emissions. While State actions alone cannot stop global warming, the adoption and implementation of this legislation demonstrates California's leadership in addressing this critical challenge. Key legislation pertaining to the State's reduction targets are describe below.

Assembly Bill 32 (2006)

Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, requires California to reduce statewide GHG emissions to 1990 levels by 2020. AB 32 directs the California Air Resources Board (ARB) to develop and implement regulations that reduce statewide GHG emissions. AB 32 requires ARB to adopt a quantified cap on GHG emissions that represents 1990 emissions levels, institute a schedule to meet the emissions cap, and develop tracking, reporting, and enforcement tools to ensure that the State achieves the required GHG emissions reductions.



Climate Change Scoping Plan

The *Climate Change Scoping Plan* was approved by ARB in December 2008 and outlines the State's plan to achieve the GHG reductions required in AB 32. The Scoping Plan contains the primary strategies California will implement to achieve a reduction of 169 MMT CO_2e, or approximately 28% from the State's projected 2020 emission level.

Executive Order S-3-05

Executive Order S-3-05 (EO-S-3-05) proclaims that California is vulnerable to the effects of climate change including reduced snowpack in the Sierra Nevada Mountains, exacerbation of California's existing air quality problems, and sea level rise. To address these concerns, the executive order established targets for reducing GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050.

Other Important California Legislation

Assembly Bill 1493 (2002)

- Requires ARB to develop and adopt regulations to 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.

Executive Order S-1-07 (2007)

- Establishes a Low-Carbon Fuel Standard to reduce the carbon intensity of transportation fuels sold in California by a minimum of 10% by 2020.

Senate Bill 375 (2008)

- Aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. Metropolitan Planning Organizations (MPO) are required to adopt a Sustainable Communities Strategy (SCS), which allocates land uses in the MPO's Regional Transportation Plan. Qualified projects consistent with an approved SCS or Alternative Planning Strategy and categorized as "transit priority projects" would receive incentives under new provisions of the California Environmental Quality Act (CEQA).

Executive Order S-20-04 (2004)

- Establishes the State's priority for energy- and resource-efficient, high-performance buildings. The executive order sets a goal of reducing energy use in State-owned and private commercial buildings by 20% in 2015.

Senate Bills 1078 (2002) and 107 (2006) and Executive Order S-14-08

- Senate Bill (SB) 1078 requires retail sellers of electricity to provide at least 20% of their supply from renewable sources by 2017. SB 107 changed the target date to 2010. Executive Order S-14-08 expands the state's Renewable Energy Standard to 33% renewable power by 2020.

Executive Order S-13-08 (2008)

- Directs the Governor's Office of Planning and Research, in cooperation with the California Resources Agency (CRA), to provide land use planning guidance related to sea level rise and other climate change impacts. The order also directs CRA to develop a State Climate Adaptation Strategy by June 30, 2009 and to convene an independent panel to complete the first California Sea Level Rise Assessment Report.

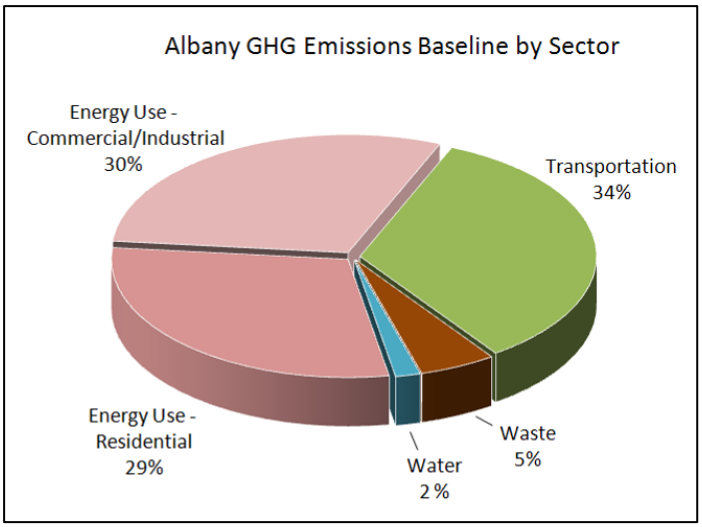
Senate Bill 97 (2007)

- Acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. CRA is required to certify and adopt guidelines for mitigating GHG emissions or the effects of GHG emissions, as required by CEQA.

Albany GHG Emissions and Reduction Target

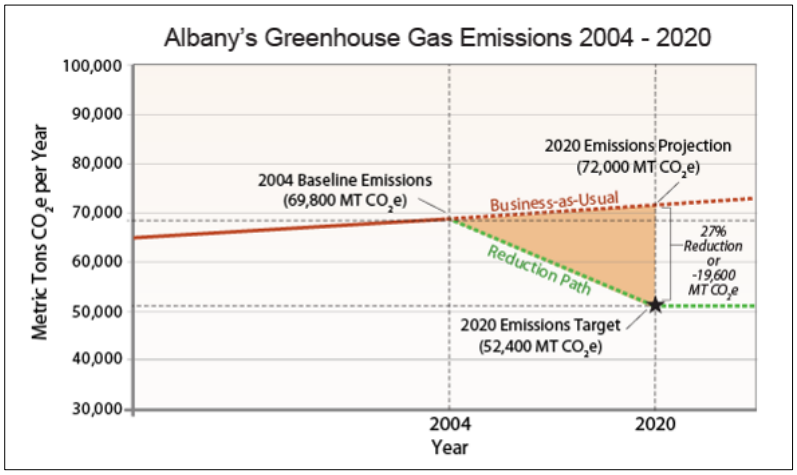
Baseline and Projections

In 2004, the City and community of Albany generated 69,830 metric tons of carbon dioxide equivalent (MT CO_2e). Almost two-thirds of these emissions resulted from residential, commercial, and industrial building energy consumption. Transportation contributed just under a third of the total and waste and water consumption made up the remainder. Assuming that current practices continue, the City's GHG emissions would be expected to increase to about 72,000 MT CO_2e in 2020, and about 85,000 MT CO_2e in 2050. This represents a 3% and 22% increase over the 2004 baseline level respectively.



Albany GHG Reduction Target

The City of Albany recognizes the critical importance of addressing climate change. In 2007, the City adopted an aggressive GHG reduction target that aims to contribute to the stabilization of global GHG emission concentrations and the achievement of AB 32 goals. Albany's adopted target requires the community's GHG emissions to be reduced by 25%, or 17,450 MT CO_2e, below 2004 baseline emission levels by 2020. Because emissions are projected to increase to 72,000 MT CO_2e in 2020, these reductions will actually need to total 19,600 MT CO_2e.



Action

Achievements to Date

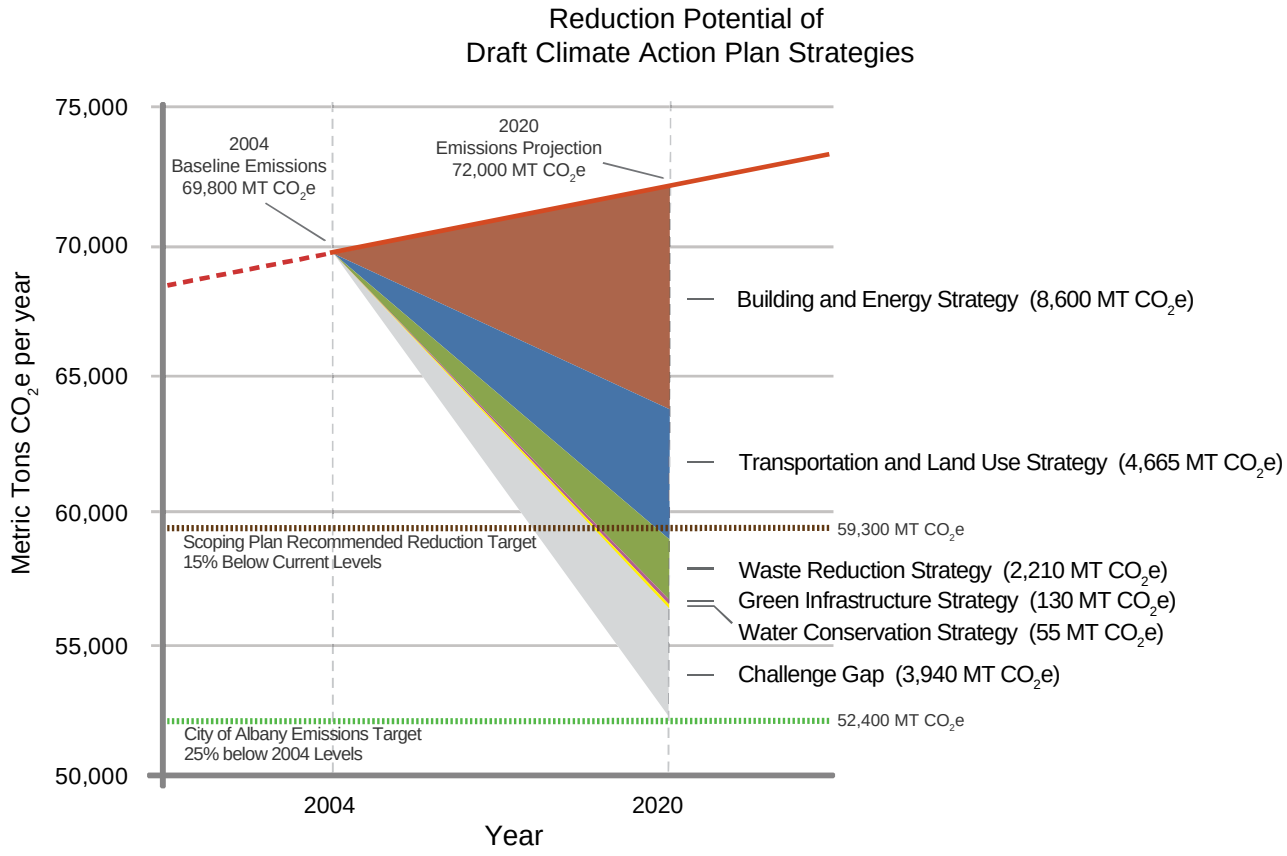
The City of Albany prides itself on being one of the greenest cities in California. The community has dedicated itself to protecting its natural, livable surroundings, and promoting a sustainable, healthy urban environment. Albany continues to be proactive by implementing a number of programs and incentives to assist the community in preserving the local environment. Existing programs and policies relevant to community GHG emissions reductions include the following:

- **75% Diversion Recycling Goal Resolution** – In 2007, the City adopted a resolution to achieve 75% waste reduction and diversion by 2010. The City has established a curbside recycling program for all plastics and has achieved one of the highest food scrap composting rates in Alameda County.
- **Polystyrene Ban** – In 2008, the City adopted an ordinance prohibiting all food vendors and City facilities from using polystyrene foam disposable food service ware and requiring that all disposable food service ware be biodegradable or compostable if cost-effective.
- **Plastic Bag Discouragement** – In 2008, the Albany City Council adopted a a resolution to discourage the use of disposable single-use plastic bags by the retail sector and community members.
- **Green Building/Bay Friendly Landscaping Ordinance** – In 2007, the City implemented an ordinace that requires all development projects within the City to follow established green building standards. The ordinance also requires the City to use Bay-Friendly Landscaping techniques and encourages such practices in private landscapes.
- **City Hall Retrofit** – The City is currently upgrading Albany City Hall. The project includes new energy-efficient lighting, HVAC system, and windows. Bay-Friendly Landscaping is also being incorporated.
- **Greening Albany School District** – The City has assisted the Albany School District with a variety of sustainability measures, including waste diversion and the development of school gardens.
- **Buchanan Bicycle and Pedestrian Path** – The City is currently developing pedestrian and bicycle infrastructure improvement plans for the area around Buchanan Street.
- **Safe Routes to School State Program** – The City is implementing improvements to the Safe Routes to School State Program through infrastructure improvements to one intersection and educational campaigns at local elementary schools.

While all of the policies and programs listed above have the potential to reduce GHG emissions, data limitations restrict the City's ability to quantify their reduction capacity. The one exception to this is the reductions gained from increasing the waste reduction and diversion rate. In 2004, Albany had achieved a 49% waste diversion rate compared to 1990 levels. By 2009, the City increased this diversion rate to 61%. This increase in waste diversion reduces the community's GHG emissions by 839 metric tons per year. This will be counted toward the GHG reduction target.

Climate Action Plan Strategies

Building from the City's tradition of environmental leadership, the CAP sets forth a plan to considerably reduce the community's GHG emissions. The strategies contained within the CAP provide approximately 15,660 MT CO_2e of potential reductions or 19% below 2004 baseline levels by 2020. The figure below demonstrates that this level of reduction goes above and beyond the recommendation of the State's *Climate Change Scoping Plan*, which calls on local governments to reduce emissions to 15% below current levels by 2020.



However, the proposed strategies alone do not achieve the City's adopted target of reducing emissions 25% below 2004 levels by 2020. To achieve this target and close the remaining 6% or 3,940 MT CO_2e gap, Albany will need to increase community participation in the CAP strategies (above the levels currently assumed) or create new reduction strategies in the future. The six strategies and the Community Challenge, which aims to close the remaining gap, are described below.

Buildings and Energy: The buildings and energy strategy recommends energy efficiency retrofits for both existing buildings, enhances energy performance requirements for new construction, increases use of renewable energy, and improves community energy management.

Transportation and Land Use: The transportation and land use strategy identifies ways to reduce automobile emissions, including improving pedestrian and bicycle infrastructure, enhancing public transit service, supporting pedestrian- and transit-oriented development, discouraging single-occupancy vehicle use, and improving the City's vehicle fleet.

Waste Reduction: The waste reduction strategy builds on past City successes by increasing waste diversion rates and educating residents to become well informed consumers.

Green Infrastructure: The green infrastructure strategy expands the City's urban forest for carbon sequestration purposes.

Water Conservation: The water conservation strategy recommends water conservation measures applicable to both indoor and outdoor water use in existing buildings and new construction.

Food and Agriculture: The food and agriculture strategy strengthens the regional food system, including urban agriculture, and increases awareness of sustainable food choices.

Each strategy contains objectives, measures and actions that translate the CAP's vision into on-the-ground implementation. Objectives refine the strategies into specific focus areas. Measures define the direction that the City will take to reduce its GHG emissions. Actions define the specific steps that City staff and decision-makers will implement over time. The strategies, objectives, and measures are listed in the following tables and are described in detail in Chapter III.

Community Challenge: The City's adopted GHG reduction target calls for 19,600 MT CO_2e of GHG emissions reductions by 2020. The strategies described above achieve 15,660 MT CO_2e of reductions. The Community Challenge calls upon Albany residents, businesses, employees, and City staff to mobilize and achieve the remaining 3,940 MT CO_2e of GHG reductions. This can be attained through higher levels of community participation in the proposed strategies and measures and/or from future reduction sources not envisioned today. Citizen involvement and leadership will be required to achieve these remaining reductions. Additional discussion of the Community Challenge is provided in Chapter III.

Climate Action Plan Measures

The CAP contains 40 GHG reduction measures. The City has quantified the GHG reduction potential of 27 of these measures. While the remaining measure will assist the community's overall climate action goals, their reduction potential was not quantified during the CAP preparation process. Tables I-1 and I-2 list the quantified and non-quantified measures respectively.

Quantified Measures

Quantified measures fall into two sub-categories; primary measures and supporting measures. Primary measures provide direct GHG reductions that have been calculated and are identified within the table. In addition to GHG reduction values, estimated cost per metric ton of GHG reduction is estimated for each primary measure. Supporting measures facilitate the reduction potential of the related primary measure. The reduction potential of the supporting measure is contained within the potential of the primary measure. Generalized costs to the City and identification of whether or not the measure would result in costs to Albany home- or business-owners are provide for both measure types. The *Cost to City* column describes estimated annual cost to the City of Albany. *Cost per Metric Ton* represents the estimated annual cost divided by the estimated annual GHG reduction potential. The *Private Cost* column identifies whether or not the measure is

expected to result in direct costs to property or business owners. Supporting information describing how GHG reduction estimates were calculated is provided in Appendix A. Supporting information describing economic costs of each measure is contained in Appendix C.

Non-quantified Measures

Non-quantified measures consist of measures whose GHG reduction potential could not be estimated at the time of plan preparation or measures that would not reduce emissions contained within the 2004 baseline inventory. GHG reduction potential could not be estimated in some measures for two reasons; a) insufficient data exists to quantify GHG reduction potential or b) no reliable quantification methodology currently exists to calculate these reductions. The City's high standard for quantification methodologies may have resulted in the exclusion of some emissions reductions, but the standard reflects the City's desire to not over estimate the reduction potential of the CAP measures. In the future reliable quantification methods may be created and the City will include such reductions.

The other sub-category of non-quantified measures is measures capable of reducing emissions that are not included in the baseline inventory. These reductions therefore do not help the City achieve its 2020 emissions reduction target. These measures remain within the CAP because the City and the community recognize that these actions will reduce global GHG emissions and help protect the climate. Generalized costs to the City and identification of whether or not the measure would result in costs to Albany home- or business-owners are provided for all non-quantified measures.

Statewide Regulations

To implement AB 32, California lawmakers have adopted a variety of companion laws that if implemented, would reduce the generation of GHG emissions statewide, across all emissions sectors. Legislation such as SB 107 and AB 1493 establish performance standards for GHG emissions from electric utilities and motor vehicles. As the regulatory framework surrounding AB 32 grows, other future laws will help further reduce GHG emissions statewide.

The timing and synergy between State regulations and CAP measures is uncertain. However, since the CAP focuses on actions the City of Albany can take to reduce community-wide emissions, reductions achieved by the City's actions were determined independent from statewide reductions.

Table I-1
Summary of CAP Measures - Quantified Reductions

Buildings and Energy Strategy - Minimize energy consumption, create high performance buildings, and transition to clean renewable energy sources.							
Objective BE-1: Lead by Example with Zero-Emission City Buildings by 2015							
Measures		**GHG Reduction Potential (MT CO2e)**	**Percentage of Total GHG Reductions Achieved**	**Average Annual Cost**	**Cost per metric ton**	**Private Cost**	**Applies to New/ Existing Development**
BE-1.1	Install cost-effective renewable energy systems on all City buildings, and install building performance data displays to demonstrate savings.	150	1.0%	$8,400	$60	No	-
Objective BE-2: Retrofit Existing Residential and Commercial Buildings to Increase Energy Efficiency and Maximize Use of Renewable Energy							
Measures		**GHG Reduction Potential (MT CO2e)**	**Percentage of Total GHG Reductions Achieved**	**Average Annual Cost**	**Cost per metric ton**	**Private Cost**	**Applies to New/ Existing Development**
BE-2.1	Develop comprehensive outreach programs to encourage energy efficiency and renewable energy investments in the community.	2,935	18.7%	$13,400	$5	No	-
BE-2.2	Identify and develop low-cost financing products and programs to encourage investment in energy efficiency and renewable energy within existing residential units and commercial buildings.	Supporting measure (BE-2.1 and BE-2.3)	-	$85k-645k	-	Yes	Existing
BE-2.3	Develop and implement point-of-sale residential and commercial energy efficiency upgrade requirements.	1,310	8.4%	$2,600	$2	Yes	Existing
BE-2.4	Identify and facilitate solar energy EmPowerment districts in commercial, industrial and mixed-use portions of the city.	2,195	14.0%	$1,300	$1	Yes	-
Objective BE-3: Require Energy Performance in New Construction							
Measures		**GHG Reduction Potential (MT CO2e)**	**Percentage of Total GHG Reductions Achieved**	**Average Annual Cost**	**Cost per metric ton**	**Private Cost**	**Applies to New/ Existing Development**
BE-3.1	Require new construction to comply with the Tier 2 energy efficiency standards contained within Section 503.1.2 of the California Green Building Code.	1,550	9.9%	$1,300	$1	Yes	New
Objective BE-4: Community Energy Management							
Measures		**GHG Reduction Potential (MT CO2e)**	**Percentage of Total GHG Reductions Achieved**	**Average Annual Cost**	**Cost per metric ton**	**Private Cost**	**Applies to New/ Existing Development**
BE-4.1	Partner with other neighboring cities and PG&E to fast-track smart grid technology in Albany.	160	1.0%	$1,300	$8	No	-
BE-4.2	Work with Alameda County to convert all street lights to LED bulbs or LED-solar systems.	170	1.1%	$34,000	$200	No	-
BE-4.4	Encourage PG&E and EBMUD to provide comparative energy and water conservation metrics on utility bills.	130	0.8%	$1,300	$10	No	-
Strategy Subtotal		8,600	54.9%				
Transportation and Land Use Strategy - Create an interconnected transportation system and land use pattern that shifts travel from autos to walking, biking, and public transit.							
Measures		**GHG Reduction Potential (MT CO2e)**	**Percentage of Total GHG Reductions Achieved**	**Average Annual Cost**	**Cost per metric ton**	**Private Cost**	**Applies to New/ Existing Development**
Objective TL-1: Facilitate Walking and Biking in the Community							
TL-1.1	Expand and enhance bicycle infrastructure throughout the City.	Stage 1: 110; Stage 2: 305 (total)	Stage 1: 0.7%; Stage 2 (Total) 2.0%	Stage 1: $976,000; Stage 2: $2,706,000	Stage 1: $8,900; Stage 2: $8,900	For both stages: No	-
TL-1.2	Install bike racks in commercial and civic areas of the City where racks do not currently exist.	230	1.5%	$2,000	$9	No	-
TL-1.3	Evaluate the community's walking infrastructure, identify potential barriers, and implement improvements.	610	3.9%	$249,000	$410	No	-
TL-1.5	Encourage additional neighborhood-serving commercial uses and mixed-use development within the City's existing commercial districts. Strive to provide access to daily goods and services within ¼-mile of residences.	1,150	7.3%	$33,000	$30	No	-

Table I-1
Summary of CAP Measures - Quantified Reductions

Objective TL-2: Make Public Transit More Accessible and User-Friendly							
Measures		**GHG Reduction Potential (MT CO2e)**	**Percentage of Total GHG Reductions Achieved**	**Average Annual Cost**	**Cost per metric ton**	**Private Cost**	**Applies to New/ Existing Development**
TL-2.2	Work with AC transit to provide bus stops with safe and convenient bicycle and pedestrian access and essential improvements such as shelters, route information, benches, and lighting.	115	0.7%	$20,000	$200	No	-
TL-2.3	Provide passes and shuttles to transit to encourage use of alternative transportation by City employees.	11	0.1	$9,000	$820	No	-
Objective TL-3: Promote Pedestrian- and Transit-Oriented Development							
Measures		**GHG Reduction Potential (MT CO2e)**	**Percentage of Total GHG Reductions Achieved**	**Average Annual Cost**	**Cost per metric ton**	**Private Cost**	**Applies to New/ Existing Development**
TL-3.1	Provide public education about benefits of well-designed, higher-density housing and relationships between land use and transportation.	70 (combined total for all education programs)	0.5%	$2,700	$40	No	-
TL-3.2	Update planning documents to promote high-quality, mixed-use, pedestrian- and transit-oriented development in the San Pablo/Solano Commercial districts.	790	5.0%	$3,800	$5	No	-
TL-3.3	Evaluate GHG emissions associated with development proposals and work with applicants to reduce emissions during project review an incentivize projects that generate low levels of GHG emissions.	Supporting measure (TL-3.2)	-	$1k-45k	-	Yes	-
Objective TL-4: Reduce Vehicle Emissions and Trips							
Measures		**GHG Reduction Potential (MT CO2e)**	**Percentage of Total GHG Reductions Achieved**	**Average Annual Cost**	**Cost per metric ton**	**Private Cost**	**Applies to New/ Existing Development**
TL-4.1	Work with ABAG and neighboring cities to improve the jobs-housing balance within the City and regional transit corridors.	225	1.4%	$1,300	$6	No	-
TL-4.2	Improve fuel efficiency of the City vehicle fleet by purchasing low- or zero-emission vehicles when vehicles are retired from service.	19	0.1	$72,800	$3,800	No	-
TL-4.4	Create and implement a voluntary transportation demand management (TDM) program to reduce weekday peak period single occupancy commute and school trips.	1,140	7.3%	$10,000	$9	Yes	-
Strategy Subtotal		4,665	29.8%				
Waste Reduction Strategy - Minimize waste.							
Objective WR-1: Become a Zero-Waste Community							
Measures		**GHG Reduction Potential (MT CO2e)**	**Percentage of Total GHG Reductions Achieved**	**Average Annual Cost**	**Cost per metric ton**	**Private Cost**	**Applies to New/ Existing Development**
WR-1.1	Establish a citywide zero-waste target for 2030.	2,210 (2004 to 2020)	14.1%	$1,300	$1	No	-
Strategy Subtotal		2,210	14.1%				
Green Infrastructure Strategy - Enhance natural assets that improve community quality of life.							
Objective GI-1: Expand and Enhance the City's Green Infrastructure							
Measures		**GHG Reduction Potential (MT CO2e)**	**Percentage of Total GHG Reductions Achieved**	**Average Annual Cost**	**Cost per metric ton**	**Private Cost**	**Applies to New/ Existing Development**
GI-1.1	Enhance the community's urban forest and other landscapes to maximize carbon sequestration, reduce stormwater runoff, and augment neighborhood aesthetics.	130	0.8%	$21,000	$160	No	-
Strategy Subtotal		130	0.8%				
Water Conservation Strategy - Celebrate water as an essential community resource							
Objective WC-1: Conserve Water in Existing Buildings/Landscapes							

Table I-1 Summary of CAP Measures - Quantified Reductions							
Measures		**GHG Reduction Potential (MT CO2e)**	**Percentage of Total GHG Reductions Achieved**	**Average Annual Cost**	**Cost per metric ton**	**Private Cost**	**Applies to New/ Existing Development**
WC-1.1	Encourage residential and commercial users to participate in EBMUD's free water audit program.	5	0.03%	$2,700	$540	Yes	Existing
WC-1.2	Encourage 50% reduction in outdoor potable water usage for existing residential and commercial properties.	5	0.03%	$2,700	$540	Yes	Existing/New
Objective WC-2: Conserve Water in New Construction/Landscapes							
Measures		**GHG Reduction Potential (MT CO2e)**	**Percentage of Total GHG Reductions Achieved**	**Average Annual Cost**	**Cost per metric ton**	**Private Cost**	**Applies to New/ Existing Development**
WC-2.1	Require new construction and major remodels to achieve indoor water efficiency 20% above the California Building Standards Code.	25	0.2%	$1,300	$50	Yes	Existing/New
WC-2.2	Require new landscape projects to reduce outdoor potable water use by 50%.	20	0.1%	$1,300	$70	Yes	New
Strategy Subtotal		55	0.4%				
Food and Agriculture Strategy - Create a sustainable and climate-friendly food system							
See Non-quantified Measures							

Table I-2 Summary of CAP Measures - Non-quantified				
Buildings and Energy Strategy - Minimize energy consumption, create high performance buildings, and transition to clean renewable energy sources.				
Objective BE-2: Retrofit Existing Residential and Commercial Buildings to Increase Energy Efficiency and Maximize Use of Renewable Energy				
Measures		**GHG Reduction Potential (MT CO_2e)**	**Private Cost**	**Average Annual Cost**
BE-2.5	Join Bay Area efforts to ensure green public transit energy sourcing.	Not included in inventory	No	$1,300
Objective BE-3: Require Energy Performance in New Construction				
Measures		**GHG Reduction Potential (MT CO_2e)**	**Private Cost**	**Average Annual Cost**
BE-3.2	Require that all new multi-tenant buildings be sub-metered to allow each tenant the ability to monitor their own energy and water consumption.	Not quantified	Yes	$1,300
Objective BE-4: Community Energy Management				
Measures		**GHG Reduction Potential (MT CO_2e)**	**Private Cost**	**Average Annual Cost**
BE-4.3	Research the feasibility of joining the Community Choice Aggregation efforts of Berkeley, Oakland, Emeryville, and other neighboring cities.	See measure text	No	$1,300
Transportation and Land Use Strategy - Create an interconnected transportation system and land use pattern that shifts travel from autos to walking, biking, and public transit.				
Objective TL-1: Facilitate Walking and Biking in the Community				
Measures		**GHG Reduction Potential (MT CO_2e)**	**Private Cost**	**Average Annual Cost**
TL-1.4	Strictly enforce pedestrian rights laws on City streets.	Not quantified	No	$20,000
Objective TL-2: Make Public Transit More Accessible and User-Friendly				
Measures		**GHG Reduction Potential (MT CO_2e)**	**Private Cost**	**Average Annual Cost**
TL-2.1	Conduct a public transit gap study that analyzes strategies for increasing transit use within the City and identifies funding sources for transit improvements.	Not quantified	No	$6,300
Objective TL-4: Reduce Vehicle Emissions and Trips				
Measures		**GHG Reduction Potential (MT CO_2e)**	**Private Cost**	**Average Annual Cost**
TL-4.3	Incentivize electric and plug-in hybrid vehicles through development of automobile charging infrastructure and preferential street parking spaces.	Not quantified	No	$1,300
TL-4.5	Evaluate and consider implementation of community parking management strategies.	Not quantified	No	$6,300
Objective TL-5: Prepare for Peak Oil				
Measures		**GHG Reduction Potential (MT CO_2e)**	**Private Cost**	**Average Annual Cost**
TL-5.1	Conduct a study of the potential effects of peak oil on the community and develop a peak oil adaptation plan.	Not included in inventory	Yes	$1,300
Waste Reduction Strategy - Minimize waste.				
See Quantified Measures				
Green Infrastructure Strategy - Enhance natural assets that improve community quality of life.				
See Quantified Measures				
Water Conservation Strategy - Celebrate water as an essential community resource.				

Table I-2 Summary of CAP Measures - Non-quantified				
See Quantified Measures				
Food and Agriculture Strategy - Create a sustainable and climate-friendly food system.				
Objective FA-1: Strengthen the Regional Food System				
Measures		**GHG Reduction Potential (MT CO_2e)**	**Private Cost**	**Average Annual Cost**
FA-1.1	Establish a permanent farmer's market site within the City and work to expand the market as a community resource.	Not included in inventory	No	$20,000
FA-1.2	Facilitate and promote Community-Supported Agriculture (CSA) organizations and services.	Not included in inventory	No	$2,700
FA-1.3	Procure regionally-produced foods for City events and encourage vendors at City-sponsored events to procure food regionally.	Not included in inventory	No	$2,700
Objective FA-2: Promote Awareness of Sustainable Food Choices				
Measures		**GHG Reduction Potential (MT CO_2e)**	**Private Cost**	**Average Annual Cost**
FA-2.1	Encourage low-carbon meals through public education.	Not included in inventory	No	$2,700
Objective FA-3: Increase and Enhance Urban Agriculture				
Measures		**GHG Reduction Potential (MT CO_2e)**	**Private Cost**	**Average Annual Cost**
FA-3.1	Establish a local community garden program to increase local food security and provide local recreation amenities.	Not included in inventory	No	$1,400

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Implementation

Climate change is one of the most critical challenges facing society today. Overcoming climate change will require substantial efforts from government, organizations, and individuals. To meet its GHG emission reduction targets, the City needs to prioritize actions; mobilize residents, business owners, and staff; and work with neighboring jurisdictions and regional agencies to create workable solutions.

Approach

Given the urgency of the challenge at hand, the City places great emphasis on implementation of CAP measures. Translating the measures into on-the-ground results requires tangible action steps, reliable funding, and the flexibility to change course as economic, political, and environmental conditions demand.

The CAP recommends a wide range of implementation actions to be performed between now and 2020. Each action is a City procedure, program, or technique to be performed either alone or in collaboration with non-City organizations or with other local, regional, state and federal agencies. Some actions would modify processes or procedures the City currently administers on a day-to-day basis (such as modifications to the building code). Others require new programs or projects. The actual timing, sequence, completion and monitoring of each identified action are all subject to available funding, sufficient staff resources, and available partnerships with other organizations.

The City has provided a recommended implementation timeframe, and identified departments that would be responsible for each action. Additionally, the City has selected performance indicators and monitoring and reporting requirements that will be used to evaluate the success of each measure. The City's Environmental Resources Division will track and report progress toward achieving the City's GHG emission reduction target of 25% below 2004 levels by 2020. The Division will provide annual reports to the City Council on the progress made toward achieving the reduction target as a whole, and for each quantified measure. Additional methods must be developed to quantify and track the achievement of Challenge Gap reductions.

Plan Adjustments and Flexibility

The 2009 CAP represents the City's best attempt to respond to the threat of climate change at the time of preparation. The field of climate action planning is rapidly evolving. Over the next decade, new information, GHG reduction methods, and legislation are likely to develop. In order to remain effective, the CAP must evolve over time. To ensure continued consistency and usefulness, the recommended actions should be updated concurrent with the City's annual budget process, and whenever the CAP is updated.

The CAP as a whole will be reviewed and modified every three years to identify potential plan update needs. These reviews will evaluate improvements to climate science, explore new opportunities for GHG reduction and climate adaptation, and respond to changes in climate policy.

Moving Forward

Everyday Actions You Can Do

In order to achieve Albany's adopted reduction target, the City will need every resident and business to become involved. Ultimately, the community's GHG emissions are the sum of individual actions and choices. To achieve the required reductions we all must realize our personal ability to affect change and work together to create a climate-responsible community.

Climate change is often framed in terms of global treaties or technological advances, but a person's everyday actions are just as important to creating a solution. ***You*** are part of the solution if you decide to walk, bike, or take public transit as an alternative to driving, buy energy efficient appliances, insulate your home, replace incandescent light bulbs with compact fluorescent light or Light-Emitting Diode technologies, air dry your dishes and clothes, use the cold cycle when you do the laundry, take shorter showers, adjust your thermostat, or plant a tree.

Albany's history proves that we can accomplish great things when we put our minds and passion into accomplishing a task. While climate change represents an unprecedented challenge, we are capable of attaining the City's GHG emission reduction goals and contributing to this critical global effort.

Chapter II
Baseline, Projections, and Targets

This chapter presents the City's greenhouse gas (GHG) emissions inventory, establishes an emissions baseline from the inventory, projects 2020 and 2050 emissions, and describes Albany's adopted emissions reduction target. The purpose of the GHG emissions inventory is to assist policy makers by identifying the source types, distribution, and overall magnitude of GHG emissions to support adoption of effective reduction measures and implementation actions.

Emissions Inventory

This section describes Albany's GHG emissions inventory. The City, in coordination with ICLEI, developed a GHG emissions inventory for both community-wide and municipal sources for the 2004 operational year. The inventory was compiled using ICLEI's Clean Air Climate Protection (CACP) Software. The community-wide sources within the CACP software are intended to represent the total GHG emissions occurring within the City and include sectors such as residential, commercial, and industrial energy use; transportation; solid waste; and optional user-defined sectors. Municipal sources, which represent all City-operated buildings or vehicles, are a subset of the community-wide sources and include government buildings, vehicle fleet, solid waste, and streetlights, among others. A summary of the inventory by emission sector (i.e., energy, transportation, waste) is provided and discussed below.

Scope of Inventory

The baseline inventory intends to capture emissions that physically occur in Albany as a direct result of activities within the community (e.g., local transportation, natural gas use). It also includes some of the emissions in other jurisdictions caused as an indirect result of activities within Albany for which adequate data exist for quantification (e.g., electricity use, waste, water). There are significantly more emissions caused indirectly by activity within the Albany community and local government operations that are excluded from this inventory and CAP. These include transportation beyond City limits, air travel by Albany residents, and the production and transportation of goods consumed in Albany. These are currently difficult to accurately quantify.

While Albany's CAP does not recognize these emissions as a local responsibility, it offers a quantitative discussion of excluded emissions sources in Chapter II, and some measures and actions that address them in Chapter III.

Emissions Inventory by Sector

Table II-1 presents Albany's 2004 community-wide GHG emissions and the percent contribution of each emissions sector. As shown below, transportation-related activities contributed approximately 72% of Albany's annual GHG emissions. Moreover, state highway vehicle miles travelled (VMT) emissions represent approximately 79% of the total transportation sector emissions. Electricity and natural gas consumption within buildings contributed 26% of Albany's community-wide GHG emissions. GHG emissions associated with residential energy use are approximately equal to that for commercial and industrial energy use. The waste sector accounted for approximately 2% of the total GHG emissions in 2004.

Table II-1.
2004 Community-wide GHG Emissions and Percent Contributions

Community Sector	GHG Emissions	
	Metric Tons CO_2e	Percent
Residential Energy Use	20,495	13%
Commercial/Industrial Energy Use	20,788	13%
Transportation		
Local travel	23,703	15%
State highway travel	89,049	57%
Waste	3,652	2%
Total	**157,687**	**100%**

Source: Data compiled by EDAW 2008 from ICLEI's CACP inventories.
Notes: Percent contribution is the percent contribution of a particular source to the total inventory.

Table II-2 presents government-related emissions and the percent contribution of each emission sector. Similar to the community-wide emissions, the government transportation sector contributes more than half (i.e., 52%) of the government-related GHG emissions.

Table II-2.
2004 Government-Related GHG Emissions and Percent Contributions

Government Sector	GHG Emissions	
	Metric Tons CO_2e	Percent
Buildings	373	41%
Vehicle Fleet	481	52%
Waste	64	7%
Total	**918**	**100%**

Source: Data compiled by EDAW 2008 from ICLEI's CACP inventories.
Notes: Percent contribution is the percent contribution of a particular source to the total inventory.

Emissions Baseline

To refine the 2004 emissions inventory to establish an effective baseline for the Climate Action Plan (CAP), the City removed GHG emissions associated with travel on state highways and added GHG emissions associated with water consumption. Table II-3 identifies the City's GHG emissions baseline for the year 2004 for purposes of the CAP. Albany's reduction target of 25% below baseline emissions by 2020 applies to these baseline emissions, which include the government-related emissions presented in Table II-3.

Table II-3.
Albany Baseline GHG Emissions and Percent Contributions

Community Sector	Final Inventory Emissions	
	Metric Tons CO_2e	Percent
Residential Energy Use	20,495	29%
Commercial/ Industrial Energy Use	20,788	30%
Transportation [1]		
Local travel	23,703	34%
Waste	3,652	5%
Water Consumption	1,190	2%
Total	**69,830**	**100%**

Source: Data compiled by EDAW 2008 from ICLEI's CACP inventories.

Notes: Totals may not appear to add exactly due to rounding.

[1] Transportation emissions occurring in the City's limits also include state highway VMT, which accounts for 89,049 metric tons CO_2e per year. These emissions are not included in the calculation of the City's baseline emissions due to the inability of City policies to control or affect state highway VMT patterns.

Transportation

Albany's community-wide transportation sector includes emissions generated from VMT on local streets and state highways. State highway traffic is responsible for 79% of the GHG inventory's total transportation emissions. The City has no control over the vehicles passing through Albany on state highways and their associated GHG emissions. Thus, the 2004 GHG emissions baseline does not include these emissions. The community-wide transportation sector contains only VMT on local roadways, which can be directly influenced by City policy and action.

Water Consumption

Energy use associated with water consumption accounts for approximately 20% of California's total energy use (California Energy Commission [CEC] 2006). However, the 2004 GHG inventory did not include emissions associated with water consumption. In order to more accurately portray existing conditions, water-related GHG emissions in Albany were added to the 2004 baseline. The East Bay Municipal Utility District (EBMUD) provided historical water consumption data (1976-2008) for Albany. The 2004 water consumption data were used to calculate the City's GHG emissions associated with water consumption.

CEC has estimated the level of electricity use associated with water supply and conveyance, water pre-treatment, water distribution, and wastewater treatment in both Northern and Southern California (CEC 2006). Assumptions used to estimate water-related electricity consumption for Albany are specific to Northern California. The California Climate Action Registry's *General Reporting Protocol* Version 3.1 GHG emission factors for electricity use were then used to calculate metric tons of carbon dioxide equivalent ($MTCO_2e$) emissions associated with water-related electricity use. Residential and commercial/industrial GHG emissions associated with energy consumption were calculated using Pacific Gas and Electric (PG&E)-specific assumptions. However, due to range of utility providers potentially engaged in the water delivery process, California statewide-average GHG emission assumptions were used to project emissions associated with water-related energy consumption in Albany.

Indirect Emissions

The emissions inventory, baseline, and projections do not include a range of indirect GHG emissions that Albany's residents, businesses, and municipal government generate. Such emissions include automobile transportation beyond City limits, air travel by Albany residents, and the production and transportation of goods consumed in Albany.

Transportation Beyond Albany

The emissions inventory quantified vehicle miles traveled within the city. Trips often originate from and lead to points beyond the city limits. Including the external portions of Albany generated trips would better reflect the community's total amount of vehicle emissions. Including such emissions would considerably increase the size of the transportation sector. It would also increase the reduction potential of many of the CAP's transportation and land use measures.

Air Travel

In 2005, U.S. citizens traveled approximately 1,900 miles per person per year on domestic airline routes (RITA, 2010). If this is true of Albany residents, it can be assumed that residents' flights would generate a considerable amount of GHG emissions. Considering the demographics of Albany and that the data available is for domestic flights only, these emissions are likely underestimated.

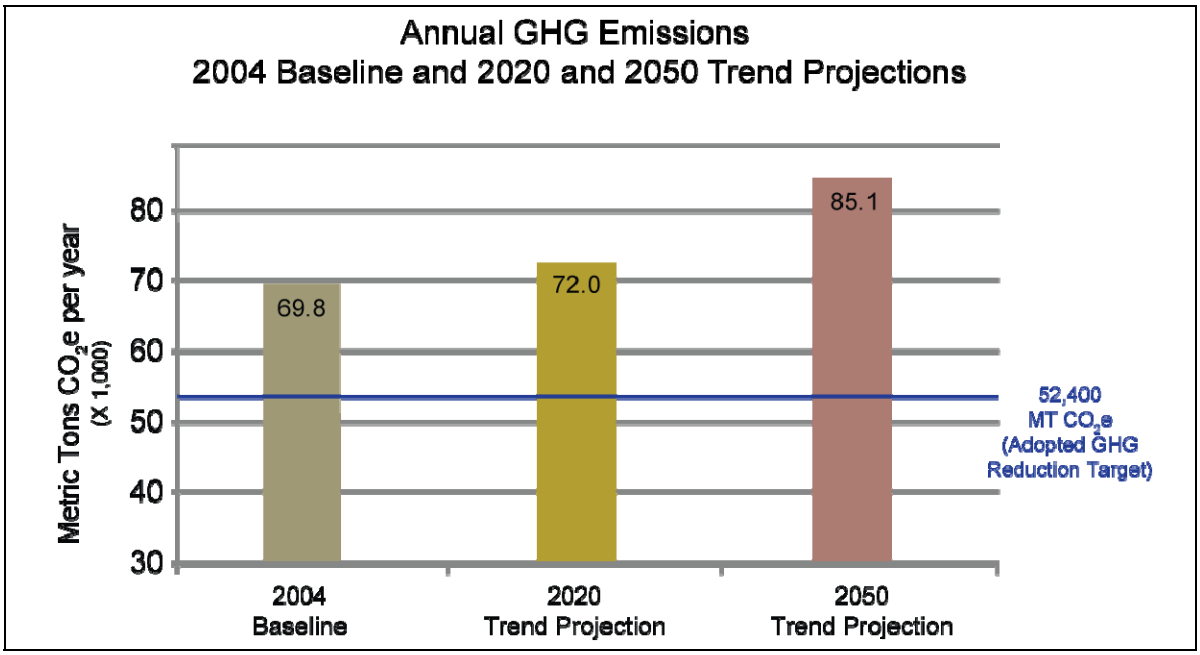
Provision of Goods

According to the U.S. EPA, the provision of goods and food (from materials extraction, production, and distribution) causes approximately 42% of GHG emissions in the U.S. (29% goods, 13% food). This equates to approximately 10 MTCO2e per capita. If Albany's purchasing habits are assumed to be similar to the U.S. average, provision of the goods and foods we consume would generate a considerable amount of emissions not included in the City's inventory.

Projections

To determine the GHG emission reductions necessary to achieve Albany's target (i.e., a 25% reduction in emissions relative to 2004 emission levels by 2020), the City's GHG emissions were projected for the years 2020 and 2050 under a trend scenario. The trend scenario assumes that historical data and trends would be representative of future year consumption rates for energy, water, and waste. It should be noted that the purpose of this CAP is to address the City's 2020 target. The City recognizes the 2050 goal (i.e., 80% below 1990 levels) established by Executive Order S-03-05. However, due to the uncertainty of projecting 2050 activity and emission levels, this CAP focuses on the 2020 goal. As 2020 approaches, the City will reevaluate its GHG reduction target to better represent progress towards the 2050 goal.

Assuming that the same type of current emissions-generating practices continue to occur within Albany, the City's GHG emissions would be anticipated to increase from 69,830 $MTCO_2e$ in 2004 to about 71,995 $MTCO_2e$ in 2020, and about 85,106 $MTCO_2e$ in 2050. This represents a 3% and 22% increase over the 2004 baseline level in 2020 and 2050, respectively. In comparison, the City's projected population is expected to increase 4% by 2020 and 16% by 2050 from 2004 (Association of Bay Area Governments [ABAG] 2002). Therefore, if current practices continue, Albany's GHG emissions are expected to increase at a higher rate than its population by 2050. This trend can be explained by increases in per capita activity levels (i.e., energy consumption, waste disposal, water consumption, and vehicle miles traveled)[1].



A description of the methods and sources of information used to project the City's 2020 and 2050 GHG emissions for each end-use sector (e.g., energy, transportation, waste, water) is provided in Appendix A. All GHG emissions have been calculated in $MTCO_2e$, which accounts for the global warming potential of nitrous oxide and methane. A summary of Albany's GHG emissions for the baseline year (2004), 2020, and 2050 is shown below in Table II-4.

[1] Growth rate assumptions by type and area: Energy consumption-US Pacific Western region; waste disposal-City adopted goal; water consumption-Albany's population growth rate; VMT-Caltrans Highway Performance Monitoring System data (Albany specific)

Table II-4.
Albany GHG Baseline (2004) and Projected 2020 and 2050 Emissions

Emissions Sector	2004 Baseline $MTCO_2e$ (Percent of Total Emissions)	2020 Projected $MTCO_2e$ (Percent of Total Emissions)	2050 Projected $MTCO_2e$ (Percent of Total Emissions)
Residential – Natural Gas	14,567 (20.9%)	17,079 (23.7%)	20,794 (24.4%)
Residential – Electricity	5,929 (8.5%)	6,487 (9.0%)	7,752 (9.1%)
Subtotal Residential	*20,496 (29.4%)*	*23,566 (32.7%)*	*28,546 (33.5%)*
Commercial – Natural Gas	8,139 (11.7%)	8,299 (11.5%)	8,883 (10.4%)
Industrial – Natural Gas	4,009 (5.7%)	3,660 (5.1%)	4,261 (5.0%)
Commercial/Industrial – Electricity	8,641 (12.4%)	9,651 (13.4%)	12,470 (14.7%)
Subtotal Commercial/Industrial	*20,789 (29.8%)*	*21,610 (30.0%)*	*25,614 (30.1%)*
Transportation	23,703 (33.9%)	23,028 (32.0%)	29,975 (35.2%)
Waste	3,652 (5.2%)	2,813 (3.9%)	–[1]
Water Consumption	1,190 (1.7%)	977 (1.4%)	971 (1.1%)
Total	**69,830**	**71,995**	**85,106**

Sources: ICLEI 2008; EDAW 2009.

Notes: Totals may not appear to add exactly due to rounding.

[1] The 2050 solid waste sector has been omitted due to uncertainty inherent in future-year data.

Table II-5.
Summary of Emission Sector Growth Rates

Emission Sector	Average Annual Growth Rate (2007-2020) [1]	Average Annual Growth Rate (2007-2030) [2]
Residential Energy Consumption – Natural Gas	1.05%	0.79%
Residential Energy Consumption – Electricity	0.60%	0.60%
Commercial Energy Consumption – Natural Gas	0.17%	0.21%
Industrial Energy Consumption – Natural Gas	-0.52% [3]	0.15%
Commercial Energy Consumption – Electricity	0.92%	0.91%
Industrial Energy Consumption – Electricity	0.54%	0.72%
Average Commercial/Industrial Energy Consumption – Electricity [4]	0.73%	0.82%
Transportation – Vehicle Miles Traveled [5]	0.73%	0.73%
Water Consumption – Gallons Consumed [5]	-0.02%	-0.02%

Source: Energy Information Administration 2009.

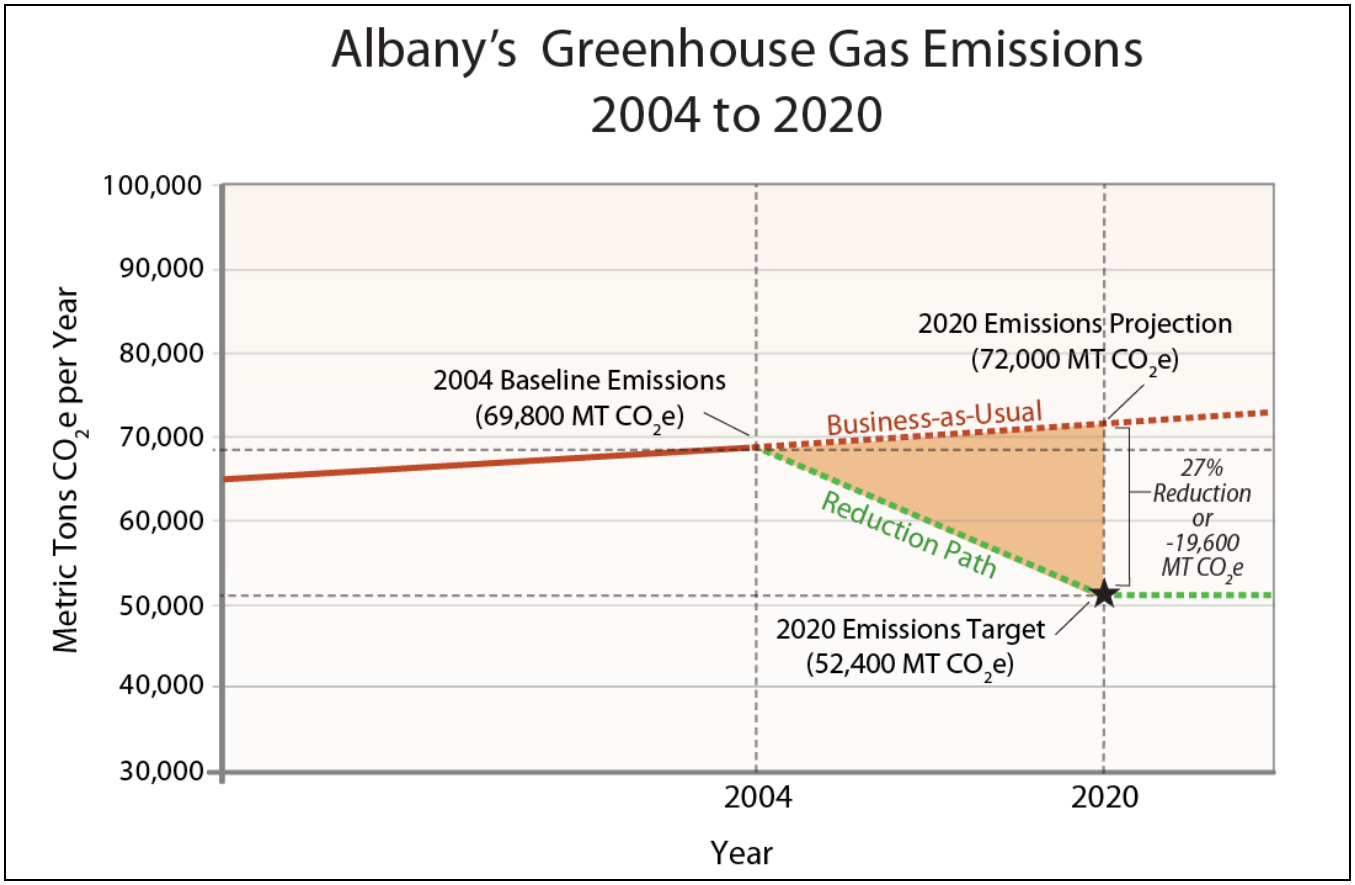
Notes: Totals may not appear to add exactly due to rounding.

[1] 2007-2020 average annual growth rates are used within the 2020 GHG projections. [2] 2007-2030 average annual growth rates are used within the 2050 GHG projections. [3] The negative average annual growth rate indicates a decrease in natural gas consumption for industrial land uses. [4] Average commercial/industrial electricity growth rates are used to project commercial and industrial electricity use to account for limitations in the 2004 baseline relative to PG&E's 15/15 Rule. [5] The same annual average growth was used for 2020 and 2050 projections

GHG Emissions Target

The City has adopted a GHG emissions reduction target of 25% below 2004 baseline emission levels by 2020. This target goes above and beyond the recommendation contained within the State's *Climate Change Scoping Plan*, which calls on local governments to reduce emissions to 15% below current levels by 2020.

Albany's aggressive CAP target will contribute to the stabilization of global GHG emission concentrations and achievement of AB 32 goals. To attain the adopted target, Albany will need to reduce community-wide GHG emissions to approximately 52,400 MT CO2e per year by 2020. This represents a 27% reduction (or approximately 19,600 MT CO2e) from projected 2020 GHG emissions levels which take into account population growth and continued consumption. Chapter III identifies the GHG reduction measures and Community Challenge program that are needed to achieve this target. The Chapter also describes the relationship of Albany's local actions to statewide efforts to curb GHG emissions.



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Chapter III
Climate Action Strategies

Strategies

This Chapter describes the six strategies that Albany has developed to reduce the community's greenhouse gas (GHG) emissions and combat global climate change. Combined, these strategies have the potential to reduce approximately 15,660 metric tons of carbon dioxide equivalent (MT CO_2e) emissions. Climate Action Plan (CAP) strategies include the following:

Buildings and Energy: Minimize energy consumption; create high performance buildings, and transition to clean, renewable energy sources. The buildings and energy strategy recommends energy efficiency retrofits for existing buildings, enhances energy performance requirements for new construction, increases use of renewable energy, and improves community energy management.

Transportation and Land Use: **Create an interconnected transportation system and land use pattern that shifts travel from personal automobiles to walking, biking, and public transit.** The transportation and land use strategy identifies ways to reduce automobile emissions, including improving pedestrian and bicycle infrastructure, enhancing public transit service, supporting pedestrian- and transit-oriented development, discouraging single-occupancy vehicle use, and improving the City's vehicle fleet.

Waste: Minimize waste. The waste strategy builds on past City successes by increasing waste diversion rates and participation in recycling and composting throughout the community.

Green Infrastructure: Enhance natural assets that improve community quality of life. The green infrastructure strategy expands the City's urban forest.

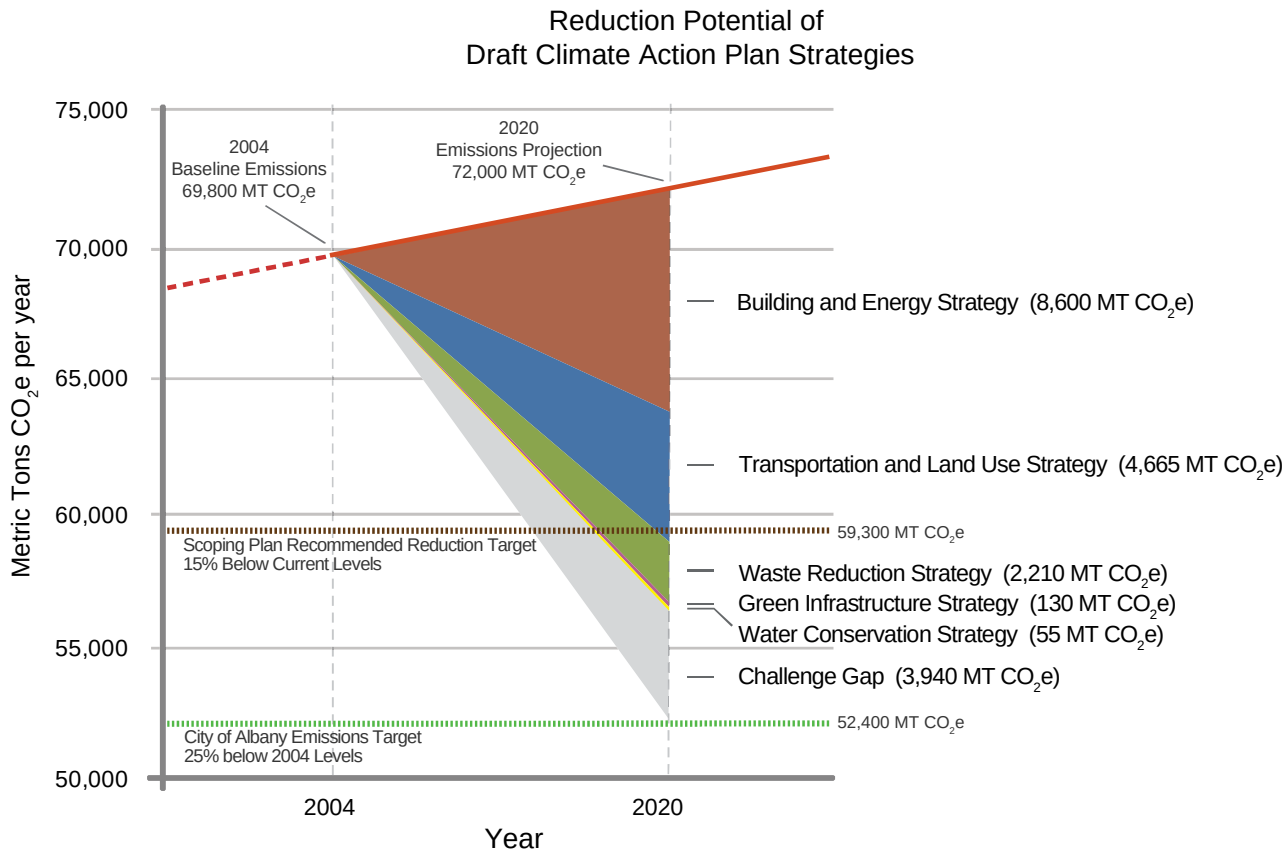
Water: Celebrate water as an essential community resource. The water strategy contains water conservation measures applicable to both indoor and outdoor water use.

Food and Agriculture: Create a sustainable and climate-friendly food system. The food and agricultural strategy promotes low-carbon diets, access to regionally-produced foods and expansion of urban agriculture within Albany.

Reduction Potential of Strategies and Objectives

The strategies contained within the Climate Action Plan identify approximately 15,660 MT CO_2e of potential reductions or 19% below 2004 baseline levels by 2020. The figure below demonstrates that this level of reduction goes above and beyond the recommendation of the State's *Climate Change Scoping Plan*, which calls on local governments to reduce community-wide emissions to 15% below current levels by 2020.

However, the proposed strategies alone do not achieve the City's adopted target of reducing emissions 25% below 2004 levels by 2020. To achieve this target, an additional 3,940 MT CO_2e of reductions will need to be generated. The City recognizes this as an important challenge for the community. Albany was purposefully conservative when estimating the reduction capacity of measures that require resident and business participation in order to not over-estimate potential reductions. If community participation in GHG-reducing activities exceeds the City's estimates, then GHG reductions could be higher than predicted and the target may be attained. The challenge facing the community is to mobilize high levels of voluntary participation in GHG-reduction efforts.



Buildings and Energy Strategy

The Buildings and Energy Strategy reduces approximately 8,600 MT CO_2e of GHG emissions, representing 55% of the CAP's total reduction capacity. Energy efficiency retrofits and renewable energy generation provide most of the reductions within this strategy. Most of Albany's residential and commercial buildings were built more than 30 years ago, prior to the adoption of California's energy efficiency standards. Considerable opportunity exists to reduce energy consumption in these structures. Albany also has high potential to support solar energy systems. Installing photovoltaic panels, solar hot water heating systems and integrating passive solar design in new construction has the potential to reduce GHG emissions.

Table III-1.
Buildings and Energy Strategy

Objective	GHG Reduction Potential (MT CO_2e)	Percentage of Strategy
BE-1: Zero-Emission City Buildings by 2015	150	2%
BE-2: Retrofit Existing Residential and Commercial Buildings to Increase Energy Efficiency and Maximize Use of Renewable Energy	6,440	75%
BE-3: Energy Performance in New Construction	1,550	18%
BE-4: Community Energy Management	460	5%
Total Buildings and Energy Strategy	**8,600**	**100%**

Transportation and Land Use Strategy

The Transportation and Land Use Strategy provides the second largest amount of emission reductions. By 2020, this strategy will reduce approximately 4,665 MT CO_2e of GHG emissions, providing about 30% of the community's total emission reductions. Albany's relatively dense neighborhoods, centrally located commercial districts, and existing public transit system provide a strong foundation for this strategy. Improving pedestrian and bicycle infrastructure and increasing diversity of uses within the City's commercial districts will provide the largest reductions. Reducing vehicle commute trips, facilitating pedestrian- and transit-oriented development, and improving public transit also contribute important reductions.

Table III-2.
Transportation and Land Use Strategy

Objective	GHG Reduction Potential (MT CO_2e)	Percentage of Strategy
TL-1: Facilitate Walking and Biking	2,295	49%
TL-2: Make Public Transit More User-Friendly	126	3%
TL-3: Promote Pedestrian- and Transit-Oriented Development	860	18%
TL-4: Reduce Vehicle Emission and Trips	1,384	30%
TL-5: Prepare for Peak Oil	-	-
Total Transportation and Land Use Strategy	**4,665**	**100%**

Waste Reduction Strategy

The Waste Reduction Strategy provides approximately 2,210 MT CO_2e of GHG reductions, or about 14% of the overall CAP reductions. For the last two decades, the City has been a leader in minimizing waste. Achieving a 90% waste reduction and diversion goal by 2030 will provide considerable GHG reductions.

Table III-3.
Waste Reduction Strategy

Objective	GHG Reduction Potential (MT CO_2e)	Percentage of Strategy
WR-1: Become a Zero-Waste Community	2,210	100%
Total Waste Reduction Strategy	**2,210**	**100%**

Green Infrastructure Strategy

Albany's green infrastructure includes many natural features that provide valuable ecosystem services to the community. The Green Infrastructure Strategy provides approximately 130 MT CO_2e of GHG reductions, or about 0.8% of the overall CAP reductions, by expanding Albany's urban forest. An enhanced urban forest would decrease building energy consumption and sequester carbon within tree biomass.

Table III-4.
Green Infrastructure Strategy

Objective	GHG Reduction Potential (MT CO_2e)	Percentage of Strategy
GI-1: Expand and Enhance the City's Green Infrastructure	130	100%
Total Green Infrastructure Strategy	**130**	**100%**

Water Conservation Strategy

The Water Conservation Strategy provides approximately 55 MT CO_2e of GHG reductions, or about 0.4% of the overall CAP reductions. Increasing water conservation provides multiple benefits to the community beyond GHG reductions.

Table III-5.
Water Conservation Strategy

Objective	GHG Reduction Potential (MT CO_2e)	Percentage of Strategy
WC-1: Conserve Water in Existing Buildings/Landscapes	10	18%
WC-2: Conserve Water in New Buildings/Landscapes	45	82%
Total Water Conservation Strategy	**55**	**100%**

Food and Agriculture Strategy

While the Food and Agriculture Strategy will help reduce global GHG emissions, the proposed measures would not reduce community emissions contained in the City's 2004 inventory. Therefore, emissions reductions have not been quantified for this strategy.

Community Challenge

The State's Climate Change Scoping Plan recommends that local governments reduce their community-wide GHG emissions to 15% below current levels by 2020. Albany's adopted target calls for the community to reduce its emissions to 25% below 2004 levels by 2020 or a reduction of approximately 19,600 MT CO_2e. The strategies described above achieve 15,660 MT CO_2e or 19% below 2004 baseline levels by 2020. While the strategies achieve the Scoping Plan recommended target they do not fully achieve the City's more aggressive target.

The Community Challenge calls upon residents, businesses, employees, and City staff to mobilize and achieve the remaining 3,940 MT CO_2e of GHG reductions. This can be achieved through high levels of community participation in the proposed measures or other individual reduction actions. Citizen involvement and leadership will be required to achieve these remaining reductions. The Community Challenge is described in more detail near the end of the chapter.

Relationship to Statewide Emission Reductions

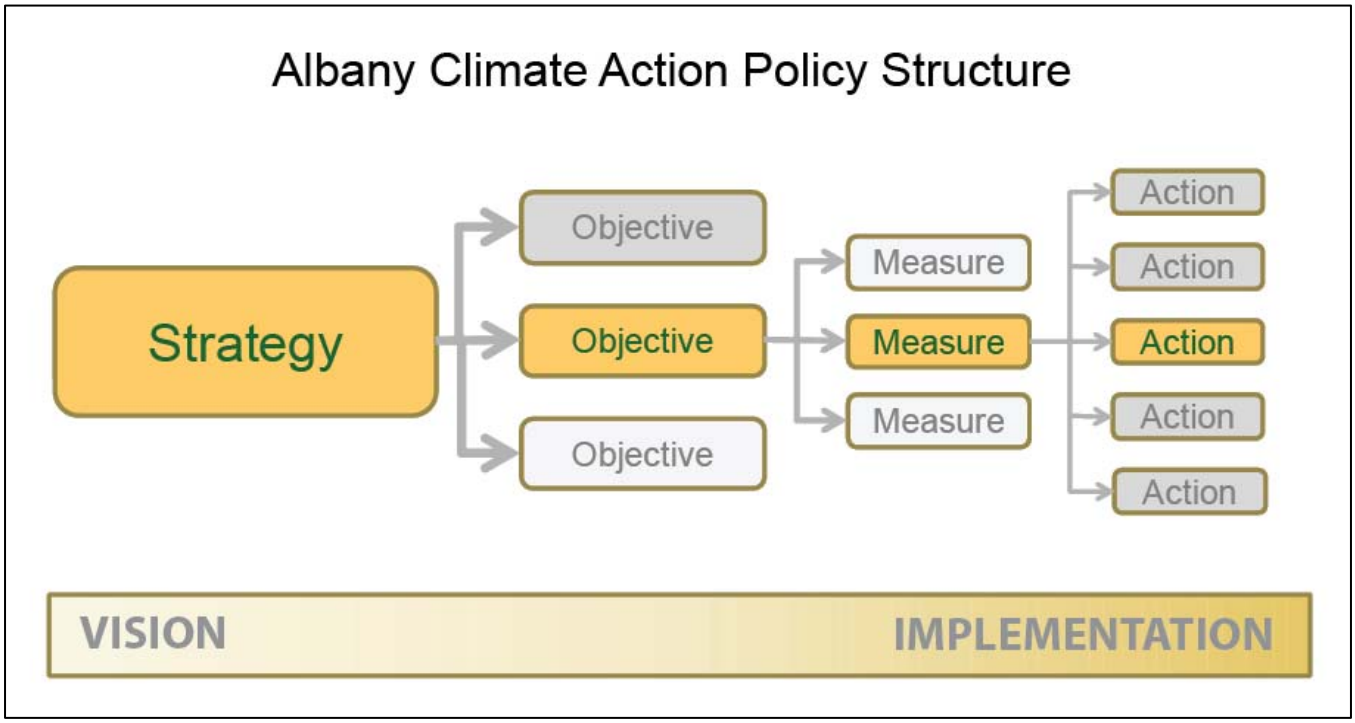
The City's CAP strategies are expected to reduce the community's GHG emissions exclusive of statewide reductions mandated through legislation such as Senate Bill (SB) 107 or Assembly Bill (AB) 1493. The City selected this approach to avoid potential double-counting of City and State GHG emission reductions. Albany has a long tradition of environmental stewardship and strives to provide a unique and independent contribution to the State's GHG gas reduction efforts.

Structure of the Climate Action Strategies Chapter

Preparing and adopting the CAP represents an early step toward achieving the City's GHG reduction target. To attain the target, the CAP must guide and facilitate change throughout the community. Each strategy contains *objectives*, *measures,* and *actions* that translate the CAP's vision into on-the-ground implementation. Objectives serve to refine the strategies into specific focus areas. Measures constitute one of the most important parts of the CAP as they define the direction that the City will take to accomplish its GHG reduction goals. Actions, in turn, define the specific steps that City staff and decision-makers will implement over time.

This chapter is divided into eight sections. The first six sections describe the Building and Energy, Transportation and Land Use, Waste, Green Infrastructure, Water, and Food and Agriculture strategies, respectively. The following section describes the Community Challenge and the additional efforts the community will need to make in order to achieve the adopted target. The final section describes the potential effect of statewide legislation on community emissions and how this relates to the City's reduction efforts.

Each strategy section provides an overview of that strategy's role in curbing the community's emissions and a background discussion describing how Albany's context relates to the objectives and measures. Following this discussion, the strategy's objectives and measures are presented.



Climate Action Measures

Within each measure descriptions are provided that identify both the City's policy direction and the action steps needed to implement each measure. Additionally, the measure descriptions provide a summary of GHG reduction potential, generalized costs to the City, estimated cost per metric ton of GHG reduction, and identification of whether or not the measure would result in costs to Albany home- or business-owners. Detailed action steps and progress indicators are also provided for the measures with quantified GHG reductions. The action steps and progress indicators will be used to evaluate the performance of each measure during implementation over the next decade.

Values within the *GHG Reduction Potential* column of the summary refer to the estimated annual emission reductions in 2020 in MT CO_2e. The *Cost to City* column uses a ranking of low, medium, and high. Low cost measures have an estimated annual cost that is less than 1% of the City's Capital Improvement Projects (CIP) or the Community Development Department (CDD) budgets. Medium cost measures would require between 1% and 5% of the CIP of CDD budget per year and high cost measures would require more than 5%. *Cost per Metric Ton* represents the estimated annual cost divided by the estimated annual GHG reduction potential (for quantified measures only). The *Private Cost* column identifies whether or not the measure is expected to result in direct costs to property or business owners. Supporting information describing how GHG reduction estimates were calculated is provided in Appendix B. Supporting information describing economic costs of each measure is contained in Appendix C.

Quantified Measures

The CAP contains 43 GHG reduction measures. The City has quantified the GHG reduction potential of 25 of these measures. Quantified measures fall into two sub-categories; primary measures and supporting measures. Primary measures provide direct GHG reductions that have been calculated and are identified within the table. In addition to GHG reduction values, estimated cost per metric ton of GHG reduction is estimated for each primary measure. Supporting measures facilitate the reduction potential of the related primary measure. The reduction potential of the supporting measure is contained within the potential of the primary measure.

Non-Quantified Measures

Non-quantified measures consist of measures whose GHG reduction potential could not be estimated at the time of plan preparation or measures that would not reduce emissions contained within the 2004 baseline inventory. The City's high standard for quantification methodologies may have resulted in the exclusion of some emissions reductions, but the standard reflects the City's desire to not over estimate the reduction potential of the CAP measures. In the future reliable quantification methods may be created and the City will include such reductions.

Measures capable of reducing emissions that are not included in the baseline inventory do not help the City achieve its 2020 emissions reduction target. These measures remain within the CAP because the City and the community recognize that these actions will reduce global GHG emissions and help protect the climate.

Selection of Measures and Action Steps

Achieving the City's GHG reduction goals will require considerable changes within the community over the next decade. Albany will need to improve alternative transportation infrastructure, accommodate infill development, increase energy and water efficiency, increase use of renewable energy, reduce waste, and enhance the urban forest. To ensure this transformation is realized, the CAP contains measures and action steps that are both ambitious and attainable.

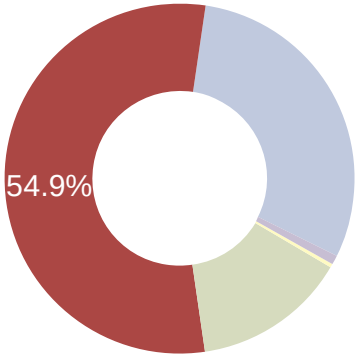
The climate action objectives and measures were developed through a) evaluation of existing community conditions, b) identification of GHG reduction opportunities within the city, including those identified by Albany's Clean and Green Task Force and Sustainability Committee, c) suggestions from the local community, d) review of best practices from leading cities and organizations, and e) incorporation of State and regional laws, guidelines, and recommendations.

After considering a wide range of potential measures, City staff, the Sustainability Committee, and the public selected the proposed measures based on the following criteria: GHG emissions reduction potential, likely cost, feasibility, and ability to create community co-benefits.

This Draft CAP provides a further opportunity for community input and review of the measures and actions. The City strongly encourages residents and business owners to provide input and feedback on the contents of this document.

Buildings and Energy Strategy

Minimize energy consumption, create high performance buildings, and transition to clean, renewable energy sources.



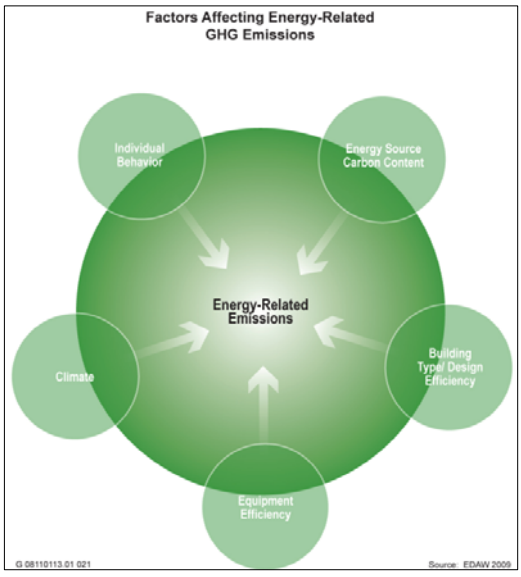
Total GHG Emissions Reduced:
8,600 Metric Tons

Objectives:

BE-1: Zero-Emissions City Buildings by 2015	- 2%
BE-2: Retrofit Existing Residential and Commercial Buildings	- 75%
BE-3: Energy Performance in New Construction	- 18%
BE-4: Community Energy Management	- 5%

Energy consumption in Albany's residential, commercial, and industrial buildings generates almost two-thirds of the City's GHG emissions. Energy efficiency improvements, renewable energy generation, green building techniques, and community energy management systems will all play important roles in helping the community achieve its GHG reduction goals.

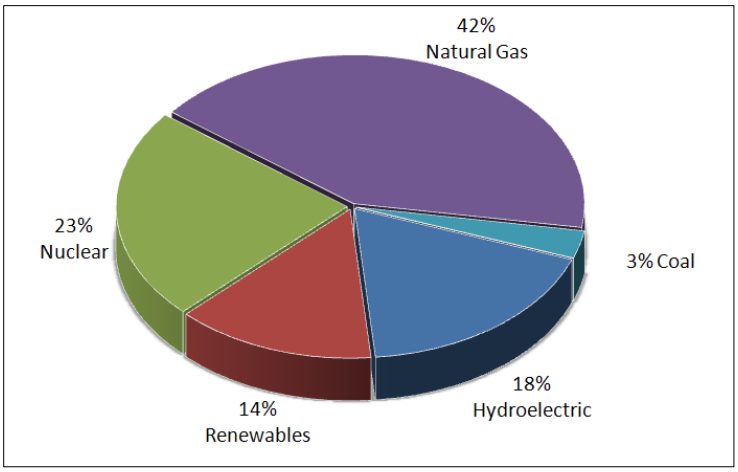
Natural gas and electricity are the two main forms of energy used within residences, businesses, and civic operations in Albany. In the Bay Area, natural gas is the primary energy source used to heat buildings, heat water, and cook. Though the carbon content of natural gas is lower than many other fossil fuels, its combustion releases considerable amounts of GHGs. Electricity used in Albany is produced at a wide variety of power generation facilities. Natural gas and coal fired power plants provide roughly half of Albany's electricity supply.



The Buildings and Energy strategy provides diverse measures aimed at reducing energy consumption and reliance on fossil fuel energy sources. Successful energy efficiency improvements will allow residents, business owners, and the City to considerably reduce energy consumption within both buildings and operations. Increasing renewable energy generation within the community will provide a local source of clean energy and will reduce the need for fossil fuel-fired power generation. Developing district heating and cooling systems and integrating smart grid technologies will clear the way for more efficient energy use. In addition to reducing GHG emissions, these measures can also lower energy bills, increase building comfort, and reduce Albany's vulnerability to energy price fluctuations.

Background

Energy Source – *Albany's current energy portfolio.*



Pacific Gas and Electric (PG&E) is Albany's energy utility, providing both natural gas and electricity for residential, commercial, industrial, and municipal uses. PG&E generates electricity at hydroelectric, nuclear, renewable, natural gas, and coal facilities. Hydroelectric operations provide 18% of the total supply. Other types of renewable energy facilities including solar, geothermal, and biomass provide 14%, nuclear plants provide 23%, natural gas facilities provide 42% and coal provides three percent. In 2007, 55% of the community's electricity was GHG free (Silverman 2007).

Under the provisions SB 107, investor-owned utilities will be 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 from 14% to at least 20%, and additional GHG-free electricity will be available to customers in Albany. For more details, see the statewide reductions discussion at the end of this chapter.

Building Stock – *The age and characteristics of Albany's homes and non-residential buildings.*

In 1978 the State of California established a set of energy efficiency standards for residential and nonresidential buildings. These standards, referred to as Title-24, are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. As a result of these standards, homes built within the last decade are approximately 4.5 times more efficient per square foot than homes built prior to 1960. For this reason, the age of a community's building stock has important implications for both building energy consumption and GHG emissions.

Residential Building Stock

U.S. Census data states that 89% of Albany's residential housing stock was constructed prior to implementation of Title-24 standards. Forty-two percent was constructed prior to 1939. Homes of this vintage frequently have minimal insulation, antiquated furnace systems, single-pane windows, and gaps in the building envelope. While a portion of the City's housing stock has been retrofitted to include energy efficiency improvements, a high level of energy savings potential still remains in the majority of the homes.

Commercial Building Stock

Approximately 90% of Albany's commercial building stock was constructed prior to Title 24. Commercial buildings built prior to 1980 often have inefficient heating, ventilation and air conditioning units. Additionally lighting systems and major appliances such as refrigeration units can often be considerably improved.

Table III-6. Age of Albany Housing Stock		
Construction Period	**Number**	**% of Total**
Built 1999 to 2000	201	3%
Built 1995 to 1998	34	0%
Built 1990 to 1994	83	1%
Built 1980 to 1989	467	6%
Built 1970 to 1979	841	12%
Built 1960 to 1969	898	12%
Built 1950 to 1959	813	11%
Built 1940 to 1949	877	12%
Built Pre 1940	3,034	43%
Total	**7,248**	**100%**

Source: U.S. Census, 2000; EDAW 2009.

Table III-7. Age of Albany Commercial Building Stock		
Construction Period	**Number of Buildings**	**% of Total**
Built 2000 to 2009	4	3%
Built 1990 to 1999	6	5%
Built 1980 to 1989	2	2%
Built 1970 to 1979	12	9%
Built 1960 to 1969	15	12%
Built 1950 to 1959	18	14%
Built 1940 to 1949	22	17%
Built Pre 1940	49	38%
Total:	**128**	**100%**

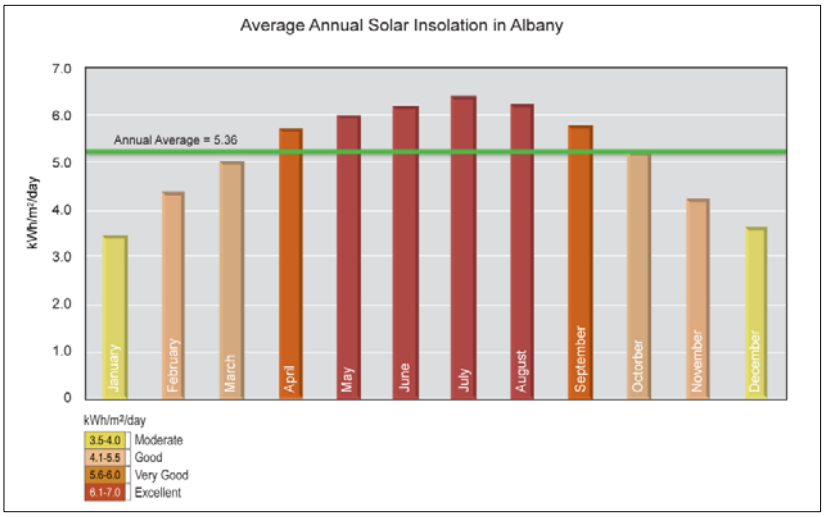
Source: City of Albany, 2009; EDAW, 2009.

Renewable energy – *The potential for renewable energy generation within the community.*

Renewable energy can be produced using distributed generation facilities such as rooftop solar systems or can be purchased through the utility grid from remote generation facilities. Presently, a limited number of renewable energy generation systems are located within Albany. Approximately 66 buildings have installed solar photovoltaic or solar hot water heater systems since 1999. No wind turbines are located within the city. As stated above, in 2007 13% of PG&E's grid portfolio came from renewable sources (exclusive of major hydroelectric facilities) and with implementation of SB 107, this will increase to 20% by 2011. Increasing local renewable energy generation and grid content will reduce considerable amounts of GHG emissions in the community.

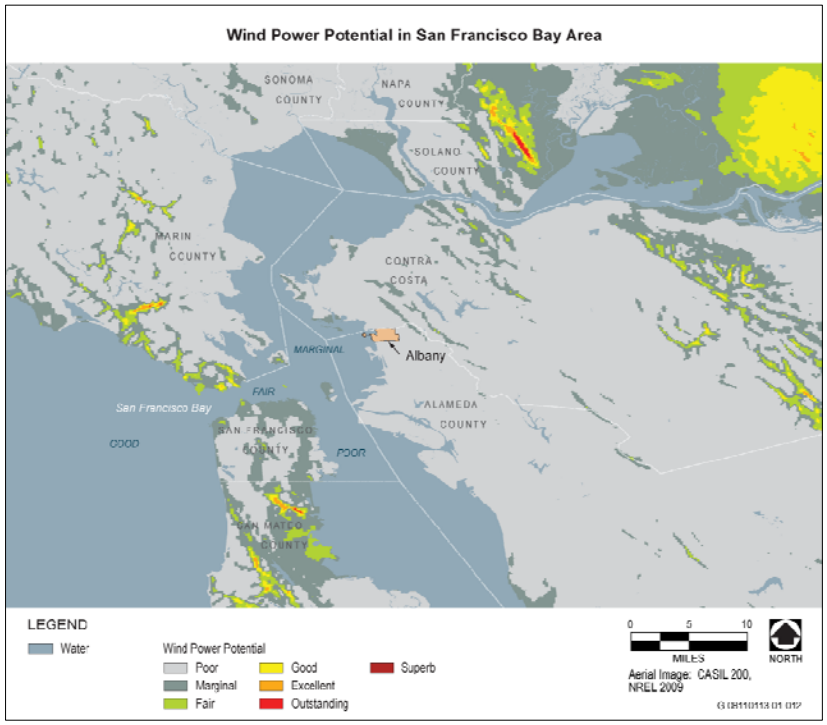
Solar Energy Potential

National Renewable Energy Laboratory (NREL) data indicates that solar energy is the most promising option for future renewable energy generation within the community (NREL 2002). Albany receives enough energy from the sun to produce an average of 5.36 kilowatts hours (kWh) per square meter per day. This level of solar insolation suggests a high potential for both photovoltaic and solar hot water heating systems in the City. Insolation levels fluctuate between summer and winter, however during the majority of the year, solar energy generation is considered good to excellent. December and January have moderate, but still acceptable, potential for solar energy generation.



Wind Energy Potential

NREL data generated using site observations and computer modelling indicates that potential for wind energy generation in Albany is low (NREL 2009). NREL models can under or over estimate wind power potential in a specific location.



Other Renewable Energy Sources

Tidal generation offers another potential source of renewable energy, but requires additional research to determine if it is practical in the San Francisco Bay. Other renewable technologies such as biomass, geothermal, and micro-hydro-generation are not likely to be practical within the City. Thus, these methods have not been considered within the CAP.

Building and Energy Objectives and Measures

Objective BE-1:

Lead by Example with Zero-Emission City Buildings by 2015

The City of Albany has the opportunity to serve as an example to the rest of the community by transitioning to zero-emission municipal buildings by 2015. The following measures work together to reduce energy demand, improve energy efficiency, and incorporate renewable generation technologies within City buildings.

Measure BE 1.1: Install cost-effective renewable energy systems on all city buildings, and install building performance data displays to demonstrate savings.

The City will conduct energy efficiency audits of all municipal buildings and explore the potential to locate renewable energy systems on City properties. The City will implement cost effective efficiency improvements and renewable energy investments. Remaining energy needs will be met through purchases of renewable and preferably local energy sources or from membership in PG&E's Climate Smart Program. The City will also install electronic building performance displays in each publicly-accessible building. The displays will provide building managers, employees, and visitors with easy-to-understand information on electricity, gas, and water use. Over time, this information will facilitate effective use of energy and water in municipal operations.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
150	$8,400	$60	No

Actions		Timetables	Responsibility
A	Conduct energy audits of all municipal buildings.	Before December 31, 2010	Building
B	Evaluate the potential to locate cost-effective renewable energy systems on City properties.	Before July 31, 2012	Environmental Resources Building
C	Purchase remaining energy from renewable sources or from PG&E's Climate Smart Program.	Before January 1, 2015	Building
D	Install electronic building performance displays in all publicly accessible buildings.	Before December 31, 2014	Building

	Progress Indicators	Target
i	Percentage of energy efficiency improvement in City buildings through retrofits and conservation measures (baseline year 2005).	20% by 2015 40% by 2020
ii	Percentage of City's building electricity from renewable sources.	100% by 2015

Objective BE-2:

Retrofit Existing Residential and Commercial Buildings to Increase Energy Efficiency and Maximize Use of Renewable Energy

Energy efficiency improvements and the installation of renewable energy generation systems have the potential to reduce considerable amounts of GHG emissions in Albany. The objective outlines public outreach programs, incentivizes and policies that will facilitate implementation within the community.

Residential

Improving the energy efficiency of Albany's existing housing stock represents a major opportunity for the community. Efficiency retrofits are capable of reducing emissions, while also reducing home energy bills and increasing comfort for occupants.

To maximize the number of residential energy efficiency improvements, the CAP establishes a comprehensive program that will educate homeowners about the benefits of efficiency upgrades, encourage home energy audits, provide financial incentives to complete energy efficiency improvements, and require point-of-sale improvements.

To achieve the estimated levels of GHG reduction, more than half of the residential units in Albany will need to implement energy efficiency improvements by 2020. The City envisions that educational programs, home audits, and financial incentives will motivate the majority of homeowners to make the necessary improvements. A point-of-sale ordinance will also be used to ensure that this important goal is obtained.

Commercial

Energy efficiency improvements in commercial buildings will provide important GHG reductions and help community businesses to reduce long term energy costs. The City seeks to provide a comprehensive commercial energy efficiency improvement program that facilitates efficiency education and outreach and provides financial incentives. The City envisions that the educational programs and financial incentives will encourage many businesses to voluntarily invest in efficiency improvements. A commercial point-of-sale ordinance will further ensure that the commercial building retrofit target is attained.

Renewable Energy Generation

To meet the GHG reduction targets expressed in AB 32 and Executive Order (EO)-S-3-05, we must reduce use of fossil fuel-based energy. Expanding renewable energy generation capacity within Albany will aid this effort. The City will develop a comprehensive renewable energy program that educates residents and businesses about the potential for solar energy generation within the community and provides financing mechanisms that maximize participation.

Measure BE 2.1:	Develop comprehensive outreach programs to encourage energy efficiency and renewable energy investments in the community.

Many property owners are not aware of the opportunities for energy efficiency and renewable energy investments. The City will partner with PG&E and other organizations to conduct a variety of public education and outreach campaigns that promote energy efficiency improvements. The City will encourage participation in free energy audit programs offered by various community non-profits and to take advantage of the low-cost energy efficiency financing program described below.

Measure BE 2.1: Develop comprehensive outreach programs to encourage energy efficiency and renewable energy investments in the community.

The City will also develop an outreach program that encourages property owners to install solar photovoltaic and solar hot water systems. The program will aim to maximize participation of the community in renewable energy generation. As described in Measure BE-2.2, the City will partner with Alameda County and regional agencies to create an effective renewable energy and energy efficiency financing program.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
2,935	$13,400	$5	No

Action		Timetables	Responsibility
A	Work with PG&E and other community organizations to develop energy efficiency outreach programs for property owners.	On-going	Environmental Resources
B	Work with community organizations to facilitate energy audits in the community.	On-going	Environmental Resources
C	Develop an Albany Climate Action Partner publicity campaign for businesses who achieve a 20% or greater increase in building energy efficiency.	Before July 31, 2011	Environmental Resources
D	Develop outreach program to encourage property owners to install renewable energy systems.	Before December 31, 2010	Environmental Resources

Progress Indicators		Target
i	Percentage of residential units and commercial uses that have voluntarily implemented energy efficiency improvements.	2% of single-family units by 2015 4% of commercial uses by 2015 5% of single-family units by 2020 8% of commercial units by 2020
ii	Percentage of residential buildings that have installed photovoltaic or solar hot water heaters.	10% by 2015 20% by 2020

Measure BE 2.2:	Identify and develop low-cost financing products and programs to encourage investment in energy efficiency and renewable energy in existing residential and commercial buildings.

Up-front costs of energy efficiency improvements and renewable energy systems (photovoltaic and solar hot water) would be a considerable burden for many homeowners and businesses. The City, in partnership with Alameda County, PG&E, and/or private lenders, will provide a series of cost-effective financing options to reduce this burden.

Financing options could include, but are not limited to, on-bill financing, low interest loans, energy efficient mortgages, revolving loans from bond sales, or an energy efficient Local Improvement District. The City will evaluate various financing products that would encourage property owners to invest in energy efficiency upgrades and renewable energy systems in existing homes. This evaluation will be conducted prior to July 31st, 2010. The City will establish a working financing program by December 31st, 2010.

The structure of the potential programs and products varies greatly. On-bill financing, low interest loans, and energy efficient mortgages establish a lender/borrower relationship in which the City, utility, County, or private lender loans the building owner money to pay for upgrades and the amount loaned is paid back over time. The cost (or payback) to the City is wholly dependent on how much the City intends to subsidize interest rates. In the case of the bond, the City would administer a revolving loan fund with the bond proceeds, pursuant to provisions of AB 811. It would also depend on the increase in energy costs, whether carbon offsets can help pay for improvements, energy efficiency rebates, and potential federal tax credits.

A number of options are available to the City, including participating in a countywide or regional program where homes would obtain an energy audit by a certified energy audit specialist, who would calculate the estimated energy efficiency improvement cost. This amount would either be charged as a voluntary property tax assessment paid over a pre-defined period (i.e., the length of payment would be based on the length of the bond); or the property owner would be charged an additional property transfer tax at the point of sale. Property owners would then make improvements to their home based on the recommended changes and would be reimbursed after confirmation by a certified energy audit specialist.

Another option includes on-bill financing, which would amortize the cost of energy efficiency retrofits to the property's monthly energy bills. In this scenario, the property owner would be reimbursed by the utility (i.e., PG&E). The intent would be to create marginal to no financial impact to the property owner as the amortized costs would be similar to the monthly energy savings.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Supporting (BE-2.1 & BE-2.3)	$85k-645k	-	Yes

Measure BE 2.3: Develop and implement point-of-sale residential and commercial energy efficiency upgrade requirements.

Based on residential property turnover in 2000, approximately 32% of Albany's existing single-family homes and 24% of existing apartment buildings will be sold to new owners between 2010 and 2020. The City of Albany will adopt a Residential Energy Conservation Ordinance requiring that at the point-of-sale, current homeowners will be required to demonstrate that key efficiency upgrades have been made to the home prior to transfer of ownership.

Required upgrades will include the elements described in the Alameda County Waste Management Authority's entry-level energy efficiency Green Package or equivalent upgrades that achieve a 20% efficiency improvement. The entry-level package would include duct sealing, attic insulation, programmable thermostats, water heater insulation, hot water pipe insulation, and draft elimination. The total cost of such improvements in Albany would be approximately $7,500 to $10,000 dollars per single-family home (as of 2009). Financing options described in Measure BE-2.2 would reduce this up-front cost to homeowners.

To facilitate energy efficiency in multi-family properties, the City will additionally require landlords to provide information on average utility bills per unit to existing and potential tenants and to the City. The City will also work with property owners to develop specific programs that encourage efficiency improvements in multifamily buildings.

Based on commercial property sales data from 2000, it is estimated that approximately 30% of commercial buildings will be sold between 2010 and 2020. The City of Albany will adopt a Commercial Energy Conservation Ordinance that requires owners of buildings built prior to the implementation of Title 24 to perform key efficiency upgrades at the point-of-sale, prior to the transfer of ownership. Owners will be required to demonstrate a 15% improvement in building energy efficiency. Due to the diversity of building types and a desire to provide owners with maximum flexibility, specific efficiency improvement requirements are not defined.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
1,310	$2,600	$2	Yes

Action		Timetables	Responsibility
A	Adopt a Residential Energy Conservation Ordinance requiring point-of-sale energy efficiency upgrades.	Before July 31, 2010	City Council Planning & Zoning
B	Work with Stopwaste.org to verify that the required efficiency upgrade package achieves at least 20% improvement in average Albany home.	Before July 31, 2010	City Council Planning & Zoning
C	Adopt a Commercial Energy Conservation Ordinance requiring point-of-sale energy efficiency upgrades.	Before July 31, 2012	Building
D	Adopt ordinance that requires landlords to provide information on average utility bills per unit to existing and potential tenants and to the City.	Before July 31, 2012	City Council Environmental Resources
E	Create energy efficiency rating system for all rental properties within Albany.	Before January 1, 2015	Environmental Resources
Progress Indicators		**Target**	
i	Percentage of residential units and commercial uses that have implemented energy efficiency improvements at point-of-sale.	20% of single-family units by 2015 15% of multi-family units by 2015 15% of commercial uses by 2015 32% of single-family units by 2020 24% of multi-family units by 2020 30% of commercial units by 2020	

Measure BE 2.4: Identify and facilitate solar energy EmPowerment districts in commercial, industrial, and mixed-use portions of City.

The solar energy EmPowerment District initiative is another key component of the City's renewable energy program. The District will encompass the commercial, institutional and industrial areas of Albany. Commercial and industrial rooftops and parking lots within Albany represent a prime opportunity for solar energy generation. Commercial and industrial facilities tend to have large, flat roofs that are typically very well-suited for installation of solar photovoltaic (PV) systems. By partnering with solar energy companies, building owners can install PV systems on their roofs or parking lots at no up-front cost, and then purchase the electricity generated from the system. Private solar contractors are able to package solar tax incentives to further reduce the cost, where, under optimal solar conditions, distributed PV systems can reduce a property owner's energy costs during the lease period.1 Some solar installers will also directly lease the roof area if it is appropriately sized, can physically support the weight of the PV systems, and has optimal solar conditions.

To achieve the stated GHG reductions, the City must achieve installation of PV systems on 40% of all eligible structures and parking areas within defined EmPowerment Districts. To maximize participation, the City will provide extensive outreach and technical assistance to interested property owners. The City will also streamline permitting process and remove regulatory obstacles that may reduce or hinder system installation.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
2,195	$1,300	$1	Yes

	Action	Timetables	Responsibility
A	Define Solar EmPowerment Districts within the community and identify solar generation opportunity sites (e.g., buildings and parking lots).	Before July 31, 2010	Planning & Zoning Environmental Resources
B	Conduct analysis of potential regulatory, structural, and market barriers to installation of photovoltaic systems on commercial buildings within defined EmPowerment Districts.	Before December 31, 2010	Building Environmental Resources
C	Develop outreach and technical assistance programs to facilitate installation of solar systems.	Before July 31, 2011	Environmental Resources
D	Streamline permitting process for photovoltaic system installation in EmPowerment Districts.	Before July 31, 2011	Building

	Progress Indicators	Target
i	Percentage of eligible buildings and parking lots with photovoltaic systems within EmPowerment District.	25% by 2015 40% by 2020

[1] Note that each roof is different and will depend on its solar orientation, weight-bearing capacity, size, potential shadowing, and a number of other factors that ultimately determine the price of the power purchasing agreement.

Measure BE 2.5:	Join Bay Area efforts to ensure green public transit energy sourcing.

Today, public transit in the Bay Area uses a diversity of energy sources including electricity, gas, diesel, natural gas, biodiesel, and hydrogen to power vehicles. Opportunity exists to transition public transit to renewable energy sources. Over time, renewable energy could make transit a GHG-neutral form of transportation. The City will join existing efforts to encourage Bay Area transit agencies to switch to renewable energy sources. However, before the City will support the use of biofuels, it will require the agencies to consider the lifecycle effects associated with each fuel type. The City will not support the use of biofuels that create remote environmental impacts such as rainforest habitat destruction or global food price increases. It should be noted that public transit-related emissions are not accounted for in the 2005 emissions inventory or baseline inventory and therefore any reductions gained from implementing this measure would not contribute specifically to the attainment of Albany's reduction target.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not included in inventory	$1,300	-	No

Objective BE-3:

Require Energy Performance In New Construction

In 2007, the City of Albany adopted a Green Building Ordinance. The Ordinance requires commercial and residential construction and renovations to be constructed in compliance with Leadership in Energy and Environmental Design (LEED) and GreenPoint Rated certification systems. While implementation of this code will greatly enhance the overall environmental performance of new buildings throughout the community, these two certification systems are not explicit in terms of requiring improved energy efficiency standards. Such standards will be important to ensuring GHG reductions are achieved in new construction. For this reason, the City will revise the municipal code to adopt the energy efficiency standards contained in the 2008 California Green Building Code (CGBC).

Measure BE 3.1:	Require new construction to comply with Tier 2 energy efficiency standards contained within section 503.1.2 of the California Green Building Code.

The City will amend the existing Albany Green Building Ordinance and adopt the Tier 2 energy efficiency standards contained in Section 503.1.2 of the 2008 CGBC as the required standards for energy efficiency for all new construction in the community. Adoption of the CGBC energy efficiency standards into the City Green Building Ordinance will provide for a 30% increase in energy efficiency over 2007 Title 24 requirements.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
1,550	$1,300	$1	Yes

Action		Timetables	Responsibility
A	Amend the Albany Green Building Ordinance to incorporate the Tier 2 energy efficiency standards contained in Section 503.1.2 of the 2008 California Green Building Code as the required standards for energy efficiency for new construction.	Before December 31, 2010	City Council Building
Progress Indicators		**Target**	
i	NA	NA	

Measure BE 3.2: Require that all new multi-tenant buildings be sub-metered to allow each tenant the ability to monitor their own energy and water consumption.

Multi-family residential buildings in Albany typically do not have separate gas and electric meters for each unit. Single meters require landlords to charge a flat rate to all tenants. This flat rate reduces an individual tenant's incentive to conserve energy. The City will amend the Building Code to require that all new multi-family buildings be sub-metered to encourage conservation.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not quantified	$1,300	-	Yes

Objective BE-4:

Community Energy Management

Climate change requires utilities, cities, and consumers to rethink how we use energy. Fortunately, both emerging and time tested tools can help achieve this transformation, including smart grid technology, advanced lighting fixtures and systems, community choice aggregation, and consumer education programs.

Measure BE 4.1: Partner with other neighboring cities and PG&E to fast-track smart grid technology in Albany.

The existing electricity delivery system in Albany relies on 100-year old technology. Electricity flows over the grid from power plants to consumers, and reliability is ensured by maintaining excess capacity. The result is an inefficient and environmentally wasteful system that emits large amounts of GHGs, relies heavily on fossil fuel power plants, and is not well-suited to accommodate distributed solar or wind energy sources. The smart grid, an emerging energy management system, which combines information technology with renewable energy to significantly improve how electricity is generated, delivered, and consumed. The smart grid will reduce energy demand, improve integration of distributed energy production, and increase the efficiency of electricity transmission and distribution. These changes will help residents and business save energy, and can reduce GHG emissions associated with energy production.

The City will work with PG&E and other neighboring cities to encourage full implementation of smart grid technologies within Albany. PG&E is already planning to install smart meters, a key component of the larger smart grid, in all homes and businesses in the Bay Area by 2010. While full integration of the smart grid will take time to realize, energy analysts estimate that it will ultimately be capable of reducing electricity-related GHG emissions by between four and 30% below current levels (CISCO 2008). When estimating the potential GHG emission reductions associated with implementation of the smart grid, the City used the low end of these projections.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
160	$1,300	$8	No

Action		Timetables	Responsibility
A	Partner with PG&E and develop a community smart grid integration plan.	Before December 31, 2011	Environmental Resources Public Works
B	Develop outreach program that informs property owners and businesses about benefits of smart grid and smart appliances.	Before July 31, 2012	Environmental Resources

Progress Indicators		Target
i	Percent of buildings with Smart Meters.	100% by 2015
ii	Percent of communitywide energy savings from Smart Grid Integration.	4% by 2020

Measure BE 4.2: Work with Alameda County to convert all street lights to LED bulbs or LED-solar systems.

Replacing conventional lamps in streetlights to Light Emitting Diode (LED) lamp technologies is a proven way to reduce both energy consumption and GHG emissions. Cities that have converted streetlights to LED have reduced their energy consumption by 40 to 70% (California Lighting Technology Center 2009, Clinton Foundation, 2010). An additional benefit of using LED lamps is the ability to focus LED lights upon intended targets, allowing greater distance between lamp posts and reducing light pollution and glare. The City will work with Alameda County to convert the approximately 350 streetlights within the city to LED technologies.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
170	$34,000	$200	No

Action		Timetables	Responsibility
A	Partner with Alameda County and convert all existing streetlights to LED bulbs.	Before December 31, 2014	Public Works

Progress Indicators		Target
i	Percentage of streetlights converted to LED.	100% by 2014

Measure BE 4.3 Research the feasibility of joining the Community Choice Aggregation efforts of Berkeley, Oakland, Emeryville, and other neighboring cities.

Albany has the option to join the community choice aggregation (CCA) efforts of other East Bay cities including Berkeley, Oakland, Emeryville, Pleasanton, and Richmond. AB 117 (2002) enables California cities and counties, either individually or as groups, to supply electricity to customers within their borders. 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 or may not own electric generating facilities. On average, CCAs can provide energy at prices 15 to 20% lower than investor owned utilities (LGC 2006).

The benefits of a CCA are directly relevant to GHG reduction efforts, as communities are able to proactively determine the amount of GHG-free energy (e.g., renewable, hydro-electric, nuclear) they purchase. Joining the CCA would allow the City to independently select electricity providers. The City would be able to reduce their electricity-related GHG emissions by selecting an electricity-supply portfolio that utilizes more GHG-free energy sources than the current Pacific Gas and Electric (PG&E) portfolio. The current PG&E electricity portfolio is comprised of 55% GHG-free sources; therefore, in order for the CCA to provide a net benefit in GHG reductions, it is assumed that the City's CCA portfolio would range from 60-100% GHG-free electricity generation sources. The range of GHG-free portfolio mixes (i.e., 60 to 100%) was used to adjust the current PG&E-specific electricity emission factor assuming the same ratio of GHG-producing sources (i.e., natural gas and coal) would continue with the CCA. The following table presents the emission reductions associated solely with the CCA program.

TABLE III-10. Emission Reductions From Community Choice Aggregation Program

Community Choice Aggregation GHG-Free Portfolio	Direct GHG Reduction in 2020 ($MTCO_2e$/year)
60%	1,800
100%	16,140

Sources of information: *Martin, Greg. 2007. 2005 PG&E-specific electricity emission factor. Oakland, CA.*

A CCA program that resulted in the purchase of a high percentage of GHG-free energy could contribute considerably to achievement of Albany's $GHG_{emissions}$ reduction target. If the CCA purchased 100% of its electricity from GHG-free sources, this measure alone would alone achieve 16,140 $MTCO_2e$ /year (82%) of the 2020 emissions target of 19,600 $MTCO_2e$ /year (a reduction of 25% below 2004 levels by 2020). Combined with the reduction potential of other non-building energy measures (7,060 $MTCO_2e$ /year) the CAP would reduce community emissions to 30% below 2004 levels by 2020.

The City acknowledges that limits to the GHG reduction potential of a CCA program could exist. Price or supply constraints could limit the CCA's ability to purchase high percentages of GHG-free energy. The City would evaluate the cost of GHG-free energy. The City would also need to ensure that its purchases of GHG-free energy are derived from additional generation sources rather than existing sources. Purchases from existing sources would not lead to reductions in global GHG emissions, as Albany's purchase of existing supplies of GHG-free energy could result in the reduction in GHG-free energy by other existing consumers.

An additional issue is that implementation of the CCA would reduce the GHG emissions reduction potential of other Building Energy measures because less GHG emissions would be generated by electricity consumption. If the CCA purchased 100% of its electricity from GHG-free sources, the reduction potential of other electricity conservation or renewable electricity generation measures would be nullified. If the CCA purchased 60% of its electricity from GHG-free sources, the impact to the reduction potential would be minimal.

Due to the uncertainty involved in establishing a CCA, the City has chosen not to include the potential GHG emissions reductions from this measure in the CAP's total estimated reductions.

Measure BE 4.3	Research the feasibility of joining the Community Choice Aggregation efforts of Berkeley, Oakland, Emeryville, and other neighboring cities.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
See measure text	$1,300	-	No

Measure BE 4.4:	Encourage PG&E and EBMUD to provide comparative energy and water conservation metrics on utility bills.

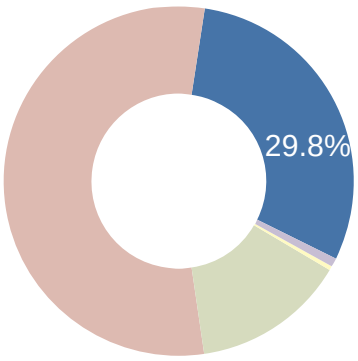
PG&E and EBMUD provide Albany residents and businesses with energy, water, and sewer services. The City will encourage these utilities to provide comparative energy and water conservation metrics and educational statements on utility bills. The bills should include statements that support efficient consumer practices and provide inefficient consumers with practical information on how to reduce their bills and energy consumption. The statements should also contain an efficiency ranking metric of similar uses in the community. This practice has been found to achieve a 2% reduction in residential electricity consumption (Tsui 2009).

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
130	$1,300	$10	No

Action		Timetables	Responsibility
A	Work with PG&E and EBMUD to establish comparative metrics on all residential utility bills.	Before December 31, 2011	Environmental Resources
Progress Indicators		**Target**	
i	NA	NA	

Transportation and Land Use Strategy

Create an interconnected transportation system and land use pattern that shifts travel from autos to walking, biking, and public transit.



Total GHG Emissions Reduced:
4,665 Metric Tons

Objectives:

- TL-1: Facilitate Walking and Biking - 49%
- TL-2: Make Public Transit More User-Friendly - 3%
- TL-3: Promote Pedestrian/Transit-Oriented Development - 18%
- TL-4: Reduce Vehicle Emissions and Trips - 30%
- TL-5: Prepare for Peak Oil

Reducing automobile-related GHG emissions will require advances in technology and improvements in community land use patterns and infrastructure. While State-mandated technological changes such as improvements in vehicle fuel efficiency and reductions in fuel carbon content are critical to reducing vehicle emissions, these alone will not be enough to achieve reductions required from transportation. Improving pedestrian, bicycle, and transit infrastructure as well as encouraging pedestrian- and transit-oriented mixed-use development are essential parts of achieving Albany's GHG reduction goal. As most infrastructure and land use decisions affecting Albany are made by the City, the objectives and measures described in this section primarily focus on these topics.

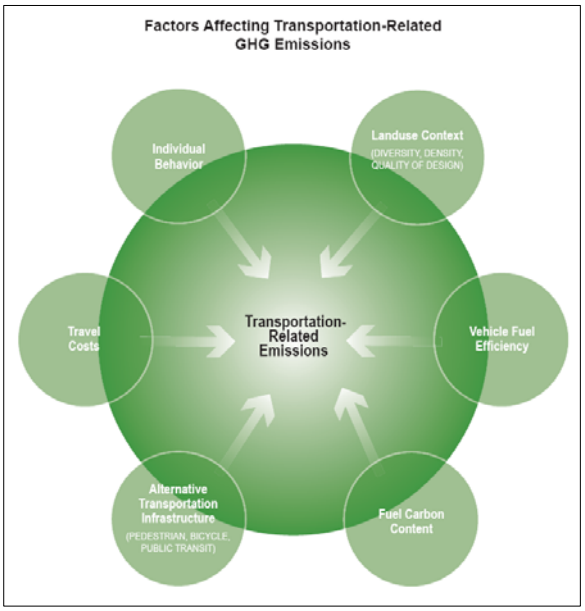
The way that land uses and transportation infrastructure are arranged within a community has a strong influence on whether residents choose to walk, bike, use public transit, or drive. These travel choices directly affect the amount of transportation-related GHG emissions produced in Albany. Single-passenger automobile trips generate substantially more GHG emissions per mile than public transit and carpooling. Walking and biking are GHG-free transportation alternatives. The Transportation and Land Use Strategy provides a variety of measures that strive to increase resident use of alternative travel modes and reduce automobile dependence in Albany.

Background

According to the 2000 U.S. Census, 59% of Albany residents drove alone to work, 12% carpooled, 19% rode public transit, 4% walked, and 4% biked to work. While alternative travel modes make up a notable share of commute trips in Albany, single-passenger automobile trips constitute the vast majority. Additionally, the majority of Climate Action Survey respondents stated that they drive to purchase daily goods and services. Combined commuting and shopping trips constitute the majority of a household's annual vehicle trips and generate a large portion of the community's transportation-related GHG emissions.

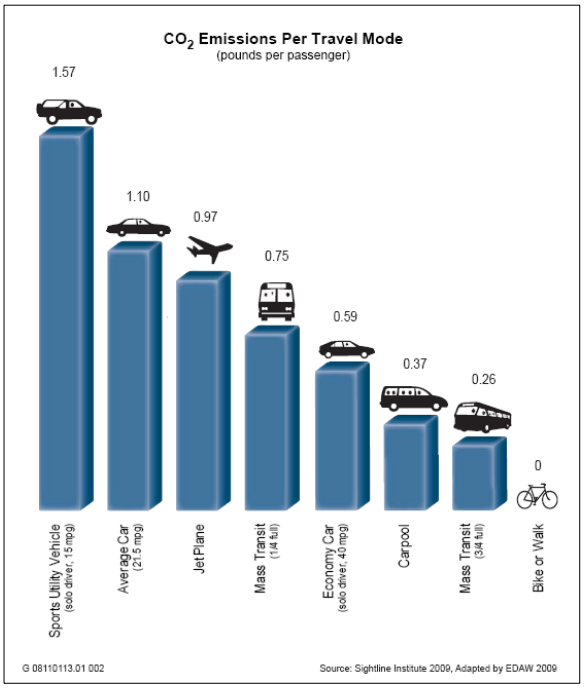
Examining Albany's existing land use pattern and transportation infrastructure provides insight into ways the community can reduce GHG emissions. A variety of land use, transportation, and urban design factors affect travel behavior. By making subtle land use changes and improving transportation infrastructure, Albany can increase walking, bicycling, and transit use. Factors most directly influencing travel behavior in Albany include: diversity of uses, proximity of uses, density, pedestrian and bicycle conditions, transit accessibility, parking, and streetscape design. Each of these is discussed in detail below.

Diversity of uses – *The degree to which residential, commercial, industrial, institutional, and recreational uses are located together.*



Increasing the diversity of neighborhood-serving, and specifically job-rich, uses within Albany could help reduce the community's transportation-related GHG emissions. Increased diversity reduces travel distances, and facilitates more walking and cycling trips. Improving the mix of uses within Albany can also reduce commute distances, particularly if affordably priced housing is located in areas with a high number of jobs and employees can commute to work using alternative modes.

A jobs/housing ratio is commonly used to evaluate the diversity of land uses within a community, by describing the relationship between employment opportunities and housing supply. A ratio of 1.0 describes a balance between jobs and housing. A ratio above 1.0 indicates that there are more jobs than housing, while a ratio below 1.0 describes an undersupply of jobs relative to housing. In 2005, there were approximately 5,000 jobs and 7,000 households in Albany and the jobs/housing ratio was approximately 0.7. This demonstrates that there are considerably fewer jobs than housing opportunities within the City, and that many Albany residents commute to other communities for employment.

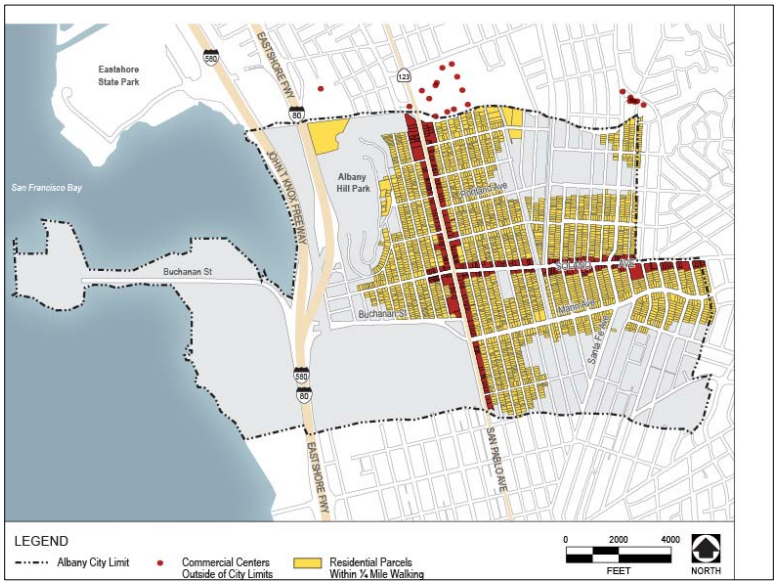


An improved jobs/housing ratio does not guarantee that residents will work within the city, but it does increase the likelihood that residents will have employment opportunities within the community. Thus, Albany's employment development efforts should strive to create jobs that match the skills and income needs of the community's labor force. Increasing the diversity of uses and particularly job-rich land uses may help reduce the community's automobile-generated GHG emissions.

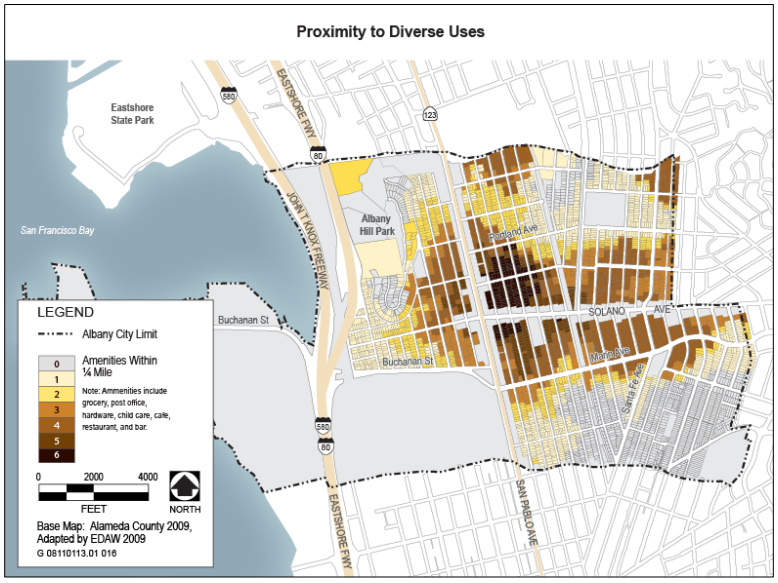
Proximity of uses – *The distance between neighborhood commercial services and residents' homes.*

Urban design research demonstrates that most people will walk to destinations that are within ¼ mile or a 5-minute leisurely walk. Neighborhoods are considered to be pedestrian-friendly if residents' homes are within ¼ mile of a diverse array of commercial and civic uses. Two methods of spatial analysis were used to evaluate the proximity of residences to commercial uses in Albany and support the development of CAP measures. The first measured proximity of residences to commercial centers and the second measured proximity of residences to a diversity of uses.

The first method examined how many residential parcels are located within ¼ mile of commercial districts and provides insight into the effectiveness of the City's existing zoning and land use pattern from the pedestrian perspective. This analysis found that 64% of Albany's residential parcels are located within ¼ mile of the neighborhood-serving commercial centers on Solano and San Pablo Avenues and those in adjacent cities. Although some residential portions of Albany are distant from commercial services; overall, the City's existing land use pattern creates many opportunities for pedestrian and bicycle travel.



While this may be the case, results from the Climate Action Survey indicate that most respondents do not walk or bike when purchasing daily goods and services. The second method of proximity analysis may explain this behavior as it demonstrates that many Albany residents do not have an adequate number of stores or services within easy walking distance of their homes. The analysis identified eight categories of neighborhood services (i.e., grocery stores, post offices, hardware stores, restaurants, bars, cafés, and child care providers), mapped all the locations of these services within Albany and adjacent cities, and then examined how many of these distinct uses are within a ¼ mile walking distance of individual residential parcels.



The analysis indicates that only 42% of residential parcels are located within ¼ mile of three or more amenities and only 30% are located near four or more. Residents living near the intersection of Solano and San Pablo Avenues have the highest level of access to diverse uses; residents in other areas of the City have access to few or none. Residents with low levels of pedestrian access to neighborhood-serving uses are more likely to drive to purchase their daily goods and services. City-directed land use and zoning changes, small business loans and other incentives could help improve the proximity to diverse uses. These actions could encourage pedestrian travel and reduce automobile dependence in Albany.

Density – *The number of housing units, people, or jobs in a given area.*

Higher densities tend to increase the number of services, shops, schools, and public buildings located within a neighborhood and increase the availability of transit and pedestrian infrastructure. These conditions tend to reduce the need for vehicle ownership and increase the use of alternative modes.

Residential Density

Residential density is normally measured in terms of housing units per acre. Albany has a relatively high residential density for a predominantly residential suburban community. Approximately 80% of the City's residential land use consists of single-family housing built on small parcels at an average density of about 12 units per acre. Approximately 5% of the City's residential land use is made up of medium density residential uses (17 to 34 dwelling units/acre) and 15% consists of high density multifamily uses (17 to 63 dwelling units/acre).

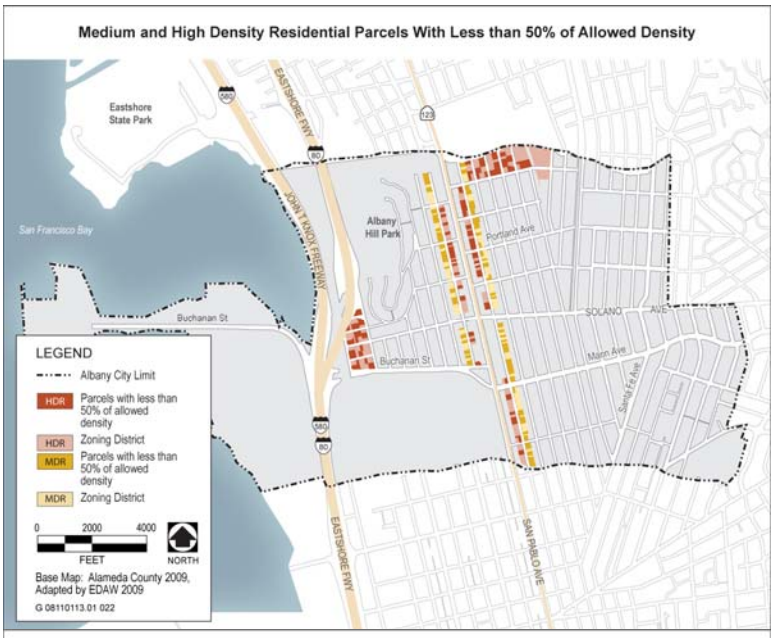
The highest density area is located in the northwest portion of Albany Hill adjacent to Interstate (I)-80, where high-rise residential towers are located.

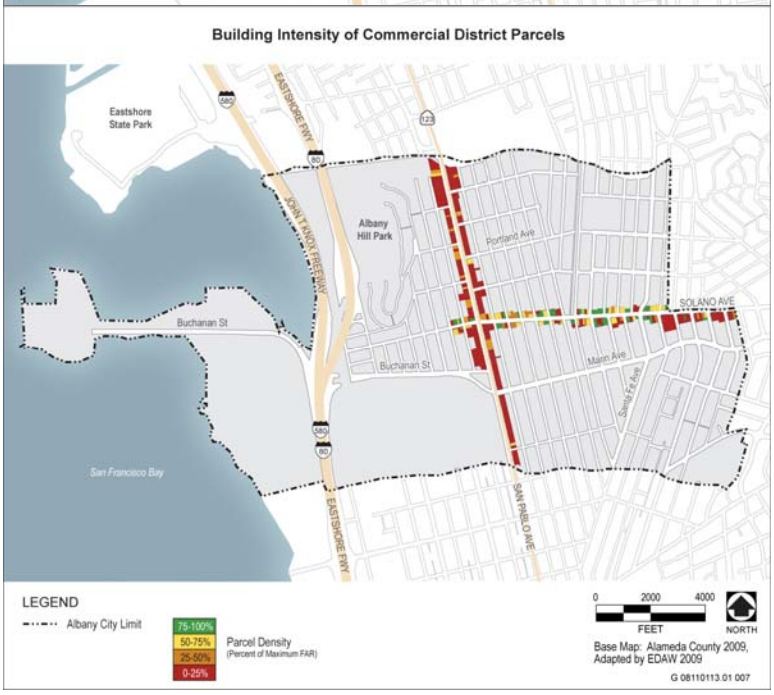
Infill development potential exists in the medium and high density residential districts parallel to San Pablo Avenue. Many of the parcels in these districts have existing densities well below those allowed in the current General Plan and Zoning Code.

Commercial Intensity

Commercial building intensity is measured using a floor-area ratio (FAR), which is obtained by dividing a building's floor area by the underlying parcel's area. The San Pablo Avenue Commercial District has a maximum allowable FAR of 2.25 for mixed-use structures and 0.95 for commercial-only structures. The Solano Avenue Commercial District has a maximum FAR of 1.25 for mixed-use or commercial structures. Currently, no minimum FAR standard exists within either district.

Many parcels in the commercial districts are built below the allowed intensities. In the San Pablo Commercial District more than two thirds of the buildings have been developed at less than 25% of the allowed FAR.





Pedestrian and bicycle conditions – *The quantity and quality of sidewalks, crosswalks, paths and bike lanes, and the level of pedestrian security.*

Well-developed pedestrian and bicycle infrastructure and pedestrian-friendly design are essential if walking and biking are to be important travel modes in a community. Highly connected sidewalks and bicycle infrastructure reduce travel distances between destinations and improve access and safety. Pedestrian and bicycle infrastructure includes sidewalks, crosswalks, traffic calming devices, bike lanes, and racks/storage facilities.

Pedestrian Infrastructure

Albany's pedestrian infrastructure is moderately developed. Though the City has a nearly complete sidewalk network, considerable pedestrian obstacles remain. A number of City sidewalks are in poor condition and others lack sidewalk cuts. These conditions create difficulties for strollers and the less physically-able and barriers for the physically disabled. Striped crosswalks are present on arterials and streets near schools, but there is little use of traffic calming devices such as bulb outs, refuge islands, and chokers. Between 2003 and 2007, the highest concentration of pedestrian collisions in Albany occurred on Solano Avenue (see Table III-6).

Bicycle Infrastructure

Albany's existing bike infrastructure and network are minimal, covering only 10% of the mileage of City streets. Class I bike paths are located west of Golden Gate Fields, and adjacent to Masonic Avenue, Buchanan Avenue, and I-580. Class II bike lanes are located on Marin Avenue, and Class III bike routes are present on Pierce Street and Santa Fe Avenue. Between 2003 and 2007, cycling accidents occurred most frequently on the City's arterial and collector streets that do not feature bicycle infrastructure (See Table III-6).

Bike racks can be found in various parts of the City, but shortages exist near civic and commercial uses, which may limit residents' desire to bike to these locations. Additionally, bike racks are often not provided in conjunction with bus stops.

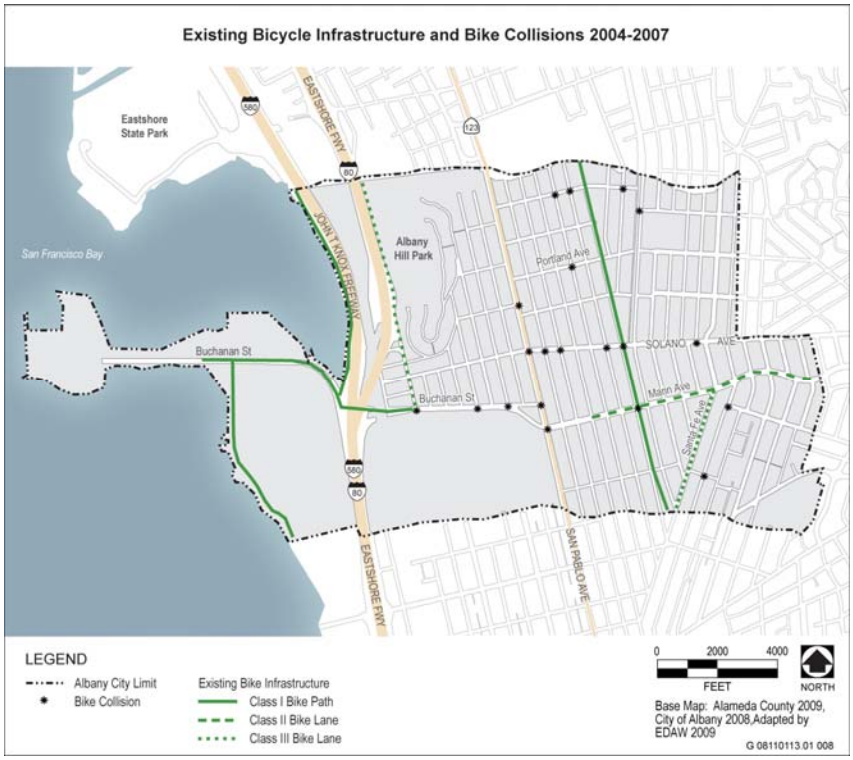


Table III-8. Albany Pedestrian and Bicycle Collision Data 2003-2007			
Street	Street Class	Number of Accidents	
		Pedestrian	Bicycle
Solano Avenue	Major Arterial	11	6
San Pablo Avenue	Major Arterial	3	3
Buchanan Street	Major Arterial	0	3
Marin Avenue	Major Arterial	3	1
Key Route	Minor Arterial	0	2
Portland Avenue	Collector	2	1
Brighton Avenue	Local	2	3
Curtis Street	Local	2	2
Cornell Avenue	Local	1	0
Neilson Street	Local	1	0
Pierce Street	Local	1	0

Source: City of Albany 2009

Transit accessibility – *The ease with which people can access transit service and the quality of that service.*

Residents and employees are more likely to use transit if traveling by bus or train is relatively time-competitive with driving, if transit stations are accessible to pedestrian and cyclists, and if the transit experience is pleasant. People are generally willing to walk ½-mile to a light rail station or ¼-mile to a bus stop. A ¼-mile walk takes the average person around 10 minutes. In Albany, about 75% of residential parcels are located within ¼ mile of a bus station or ½ mile of a BART station.

The City is currently served by 11 local and express AC transit routes serving the East Bay and San Francisco.

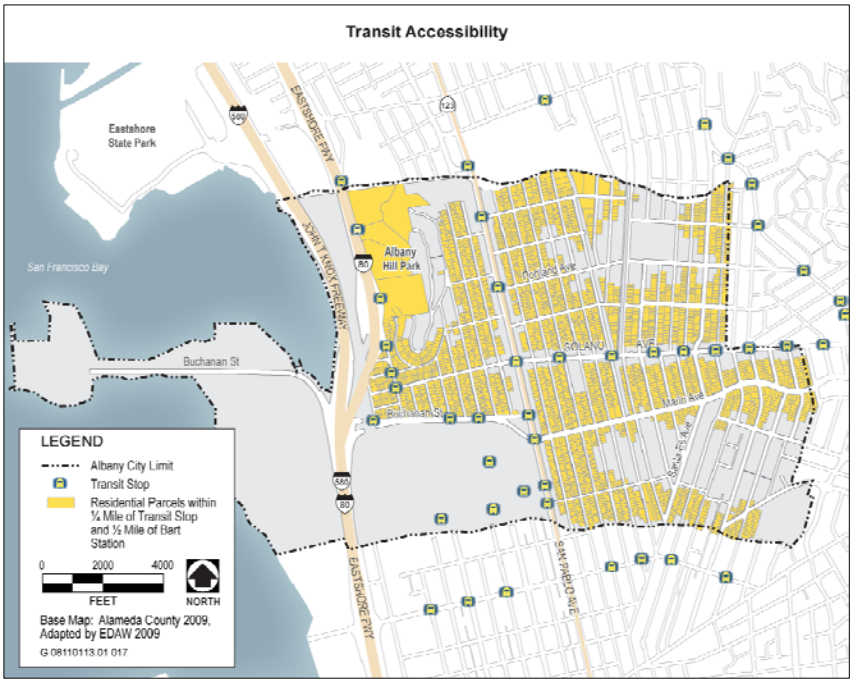


Table III-9.
AC Transit Bus Routes with Service in or Adjacent to Albany

Route	From	To	Weekdays			Weekends	
			Operating Hours	Headway (minutes)		Operating Hours	Headway (minutes)
				Peak	Mid-day		Peak
G	El Cerrito	San Francisco	5:45–8:30am 4:00–8:00pm	30		No Weekend Service	
18	Albany	Montclair	5:00–12:00am	15	30	6:00–12:00am	20
L	San Pablo	San Francisco	5:45–8:45am 3:30–9:30pm	20		No Weekend Service	
52L	El Cerrito	UC Berkeley	6:30–12:00am	30		7:00–12:00am	30
Z	Albany	San Francisco	7:30–9:00am 4:30–6:15pm	20–35		No Weekend Service	
72/72M	Richmond	Oakland	4:15–12:30am	15		5:15–1:00am	15–30
72R	San Pablo	San Francisco	6:15am–8:00pm	12–15		No Weekend Service	
79	El Cerrito	Berkeley	6:00am–10:30pm	30		6:15am–10:30pm	30
H	Richmond	San Francisco	6:15–8:45pm 4:30–8:45pm	20		No Weekend Service	
9	Berkeley Marina	7:00am–9:00pm	7:00am–9:00pm	20		7:00am–8:45pm	30
800	Richmond	San Francisco	1:00–6:00am	60		1:00–6:00am	60

Parking – T*he supply, price, and regulation of parking facilities.*

Cheap and abundant parking increases automobile ownership and use. Large parking lots also disperse destinations and reduce walking and public transit convenience and use. Parking management and fees can reverse the equation, reducing driving and increasing use of other travel modes.

Parking on all Albany streets is free; however to provide for reasonable turnover, parking in the downtown area is time limited. Most parking spaces on San Pablo Avenue and Solano Avenue have 90 minute limits. Relatively few large parking lots are located in the San Pablo Commercial and Solano Commercial zoning districts.

Streetscape design – *The scale and design of* streets*, sidewalks, and adjacent uses.*

Urban design research demonstrates that people walk more and drive less in pedestrian-oriented commercial districts than in automobile-dominated commercial centers. Street designs that reduce vehicle traffic speeds, improve walking and cycling conditions, and enhance the pedestrian experience encourage use of alternative modes.

Recent improvements on Solano Avenue west of Masonic Avenue and east of San Pablo Avenue have introduced a variety of pedestrian-friendly design features to Albany, including widened sidewalks, street trees, benches, decorative street lights, and bulb-out pedestrian crossings. San Pablo Avenue has not benefited from the same level of improvement and remains an automobile-dominated environment.

Transportation and Land Use Objectives and Measures

Objective TL-1:

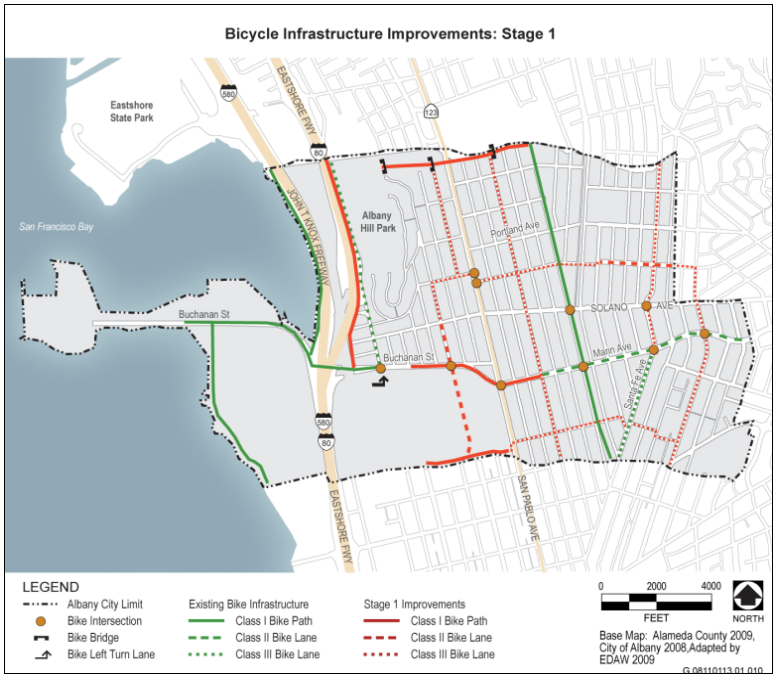
Facilitate Walking and Biking in the Community

Walking and biking do not generate GHG emissions. To encourage residents to shift from their cars to these alternative travel modes, two essential elements are needed: a) safe and convenient pedestrian and bike routes, and b) a diversity of uses within a short distance of residents' homes. The following measures encourage increased walking and biking in Albany by investing in infrastructure, enforcing existing laws, and creating incentives to attract additional neighborhood-serving commercial uses.

Measure TL 1.1: Expand and enhance bicycle infrastructure throughout the City.

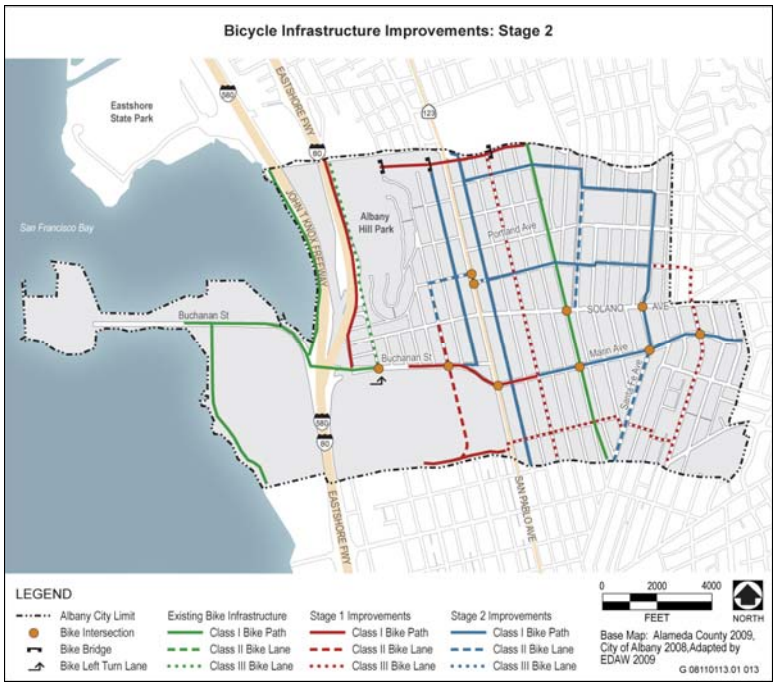
Albany currently contains a limited bicycle infrastructure network. Expanding and enhancing the bicycle network will help reduce GHG emissions, enhance mobility for all ages and abilities, and increase the health and fitness of Albany residents.

Proposed bicycle infrastructure improvements will be based on street types and existing characteristics. Bicycle infrastructure improvements will include development of bike paths, cycletracks, class II bike lanes, bicycle-friendly intersections, and signs to improve cyclist safety. Streets with higher traffic volumes will include cycle tracks, bike lanes, or bicycle intersections. Lower volume residential streets will be subject to minor improvements, such as signs and traffic calming features.



Measure TL 1.1: Expand and enhance bicycle infrastructure throughout the City.

Understanding that bicycle infrastructure improvements can be expensive; this important objective will be accomplished in stages. An important first stage will be to implement the bike infrastructure improvements contained in the current Bicycle Master Plan. A second stage of improvements will be made in phases as funding becomes available, with the goal of providing a seamless bicycle network throughout the City. An example of potential second stage bicycle infrastructure improvements is provided below.



GHG Reduction Potential (MT CO2e)	Cost to City	Cost Per Metric Ton	Private Cost
Stage 1: 110 Stage 2: 305 (total)	Stage 1: $976,000 Stage 2: $2,706,000	Stage 1: $8,900 Stage 2: $8,900	No

	Action	Timetables	Responsibility
A	Revise standard street cross-sections within the General Plan Circulation Element to ensure that all roads accommodate the needs of pedestrians, bicyclists, public transit riders, and automobile drivers.	Before December 31, 2011	Planning & Zoning (General Plan Update)
B	Revise and adopt the Bicycle Master Plan to incorporate a wider extent of Complete Streets.	Before July 31, 2012	Planning & Zoning (General Plan Update)
C	Construct Stage 1 bicycle infrastructure improvements described in the current Bicycle Master Plan.	Before January 1, 2015	Transportation
D	Construct Stage 2 bicycle infrastructure improvements.	To be phased in as funds become available.	Transportation

	Progress Indicators	Target
i	Bicycle network coverage.	30% bicycle network coverage by 2015 90% bicycle network coverage by 2020
iii	Walking and bicycling mode share of commute trips.	15% combined by 2020

Measure TL 1.2: Install bike racks in commercial and civic areas of the City where racks do not currently exist.

Bike racks are essential to encourage bicycle ridership for commuting and daily shopping/errand running trips. The City will identify commercial and civic areas that lack appropriate levels of bicycle parking and will install the needed facilities. The City will also require new development to provide adequate bicycle parking for tenants and customers. Businesses with more than 50 employees will be required to provide end-of-trip facilities including showers, lockers, and Class I covered bicycle storage facilities.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
230	$2,000	$9	No

	Action	Timetables	Responsibility
A	Conduct bicycle parking analysis in City's commercial and civic areas.	Before December 31, 2011	Transportation
B	Install bicycle parking facilities in underserved areas (20% of total to be Class I or II bicycle parking facilities).	Before July 31, 2012	Transportation
C	Adopt ordinance that requires new development to provide adequate bicycle parking for tenants and customers; and requires businesses with more than 50 employees to provide end-of trip facilities including showers, lockers, and Class I bicycle storage facilities.	Before July 31, 2012	City Council Transportation

	Progress Indicators	Target
i	Bicycle parking-to-auto parking ratio.	50% bicycle parking by 2015 100% bicycle parking by 2020
ii	Percentage of businesses with over 50 employees with end-of-trip facilities.	100% by 2020

Measure TL 1.3: Evaluate the community's walking infrastructure, identify potential barriers, and implement improvements.

The City will prepare and adopt a Walking Master Plan. As part of the planning process, the City will conduct a study of existing obstacles that discourage walking in the community. Obstacles such as deteriorated sidewalks, vehicles or vegetation blocking walking paths, sidewalk segments without curb-cuts, debris on streets, and poor intersection design , which discourages walking within the community. The obstacle study will identify existing barriers and help the City prioritize facility improvements and code enforcement activities.

The City will construct walking infrastructure improvements identified in the obstacle study and Walking Master Plan as funds become available. Improvements will consist of additional crosswalks, sidewalk cuts, and traffic calming elements. Streetscape upgrades will be focused in the San Pablo and Solano Avenue commercial districts and traffic calming features will be installed throughout the City.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
610	$249,000	$410	No

Measure TL 1.3: Evaluate the community's walking infrastructure, identify potential barriers, and implement improvements.

Action		Timetables	Responsibility
A	Conduct a pedestrian obstacle study.	Before September 1, 2010	Transportation
B	Prepare and adopt a Pedestrian Master Plan.	Before December 31, 2012	Planning & Zoning
C	Construct pedestrian improvements identified in the pedestrian obstacle study and Pedestrian Master Plan.	Before December 31, 2017	Transportation

Measure TL 1.4: Strictly enforce pedestrian rights laws on City streets.

The City of Albany will increase police enforcement of pedestrian rights laws such as mandatory stops for automobiles when pedestrians are attempting to cross at designated crosswalks. The City will also explore the use of additional signs to inform motorists of the existing laws.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not quantified	$20,000	-	No

Measure TL 1.5: Encourage additional neighborhood-serving commercial uses and mixed-use development within the City's existing commercial districts. Strive to provide access to daily goods and services within ¼-mile of residences.

Increasing the diversity of neighborhood-serving uses within the existing commercial districts will reduce the number of vehicle trips and vehicle miles traveled within the community. The City will evaluate methods to increase the diversity of uses within its existing commercial centers. The City will develop small business incentive programs, and work with the business community to review land use, zoning, development standards, and other regulations and remove any unnecessary barriers that may impede the establishment of neighborhood-serving commercial uses. The City will coordinate these and other business development initiatives within a new Economic Development element in the General Plan.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
1,150	$33,000	$30	No

Action		Timetables	Responsibility
A	Conduct study that examines methods to attract additional neighborhood-serving uses and mixed-use development to commercial districts.	Before December 31, 2011	Planning & Zoning (General Plan Update)
B	Develop small business incentive programs to encourage new neighborhood-serving uses.	Before December 31, 2012	Community Development

Measure TL 1.5:	Encourage additional neighborhood-serving commercial uses and mixed-use development within the City's existing commercial districts. Strive to provide access to daily goods and services within ¼-mile of residences.		
C	Conduct audit of land use, zoning, development standards, and other regulations that may act as barriers to neighborhood serving businesses and mixed-use development.	Before December 31, 2011	Planning & Zoning (General Plan Update)
D	Create new Economic Development element in General Plan.	Before December 31, 2011	Planning & Zoning (General Plan Update)
Progress Indicators		**Target**	
i	Percentage of residential parcels within ¼ mile of three or more neighborhood amenities.	55% by 2015 65% by 2020	

Objective TL-2:

Make Public Transit More Accessible and User-Friendly

Public transit generates 80% less GHG emissions than the average private automobile and 40% less than a fuel-efficient car (40 miles per gallon). For residents and employees to switch from automobiles to public transit, transit service needs to be convenient, comfortable, and reliable. The following measures seek to improve transit services and increase use of public transit travel modes.

Measure TL 2.1: Conduct a public transit gap study that analyzes strategies for increasing transit use within the City and identifies funding sources for transit improvements.

The City will work with AC Transit and conduct a public transit gap analysis to evaluate ways to increase transit ridership. The study will identify existing transit conditions and document deficiencies and opportunities for improvement. The study will provide the City and AC Transit with information needed to refine future transit investments and public outreach programs.

An existing known gap in the community's bus system is the lack of transit service to the regional commercial uses located on Eastshore Highway in western Albany. The City will work with AC Transit and property owners to extend Bus Line 18 to provide bus service to stores in that area.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not quantified	$6,300	-	No

Measure TL 2.2: Work with AC transit to provide bus stops with safe and convenient bicycle and pedestrian access and essential improvements such as shelters, route information, benches, and lighting.

Improving the safety, comfort, and convenience of transit stations will encourage additional transit ridership in the community. The City will work with AC Transit to provide shade, weather protection, seating, lighting, and route information at all transit stops in the community. The City will also evaluate pedestrian and bicycle access to transit stations and work to remove existing barriers.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
115	$20,000	$200	No

	Action	Timetables	Responsibility
A	Consult with AC Transit to ensure Albany bus stops provide shade, weather protection, seating, lighting, and route information.	Before December 31, 2017	Transportation
B	Conduct a study of bicycle and pedestrian access to transit stations.	Before July 31, 2012	Transportation

	Progress Indicators	Target
i	Percentage of bus stops with shade, weather protection, seating, lighting, and route information.	80% by 2015 100% by 2017

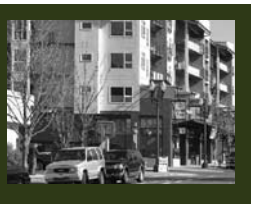
Measure TL 2.3: Provide passes and shuttles to transit to encourage use of alternative transportation by City employees.

The City of Albany employs approximately 130 people. A 2007 employee survey found that six percent of municipal employees currently ride public transit to work. Forty percent stated that if the City provided free passes they would use public transit for their commutes. The City will offer AC Transit and/or BART passes free of charge to all full-time City employees. If sufficient demand exists, the City will also provide employees with free morning and evening shuttles to the El Cerrito BART station.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
11	$9,000	$820	No

Objective TL-3:

Promote Pedestrian- and Transit-Oriented Development



Pedestrian- and Transit-Oriented Development (PTOD) refers to mixed-use residential and commercial neighborhoods designed to maximize pedestrian mobility and transit access for residents, shoppers, and employees. People living and working in such areas tend to drive vehicles less often and therefore emit fewer GHGs than people living and working in more automobile-oriented areas. Many successful PTOD projects exist in the San Francisco Bay Area, including developments in Downtown Hayward and Redwood City. Though Albany does not have a major transit station within its borders, the City's proximity to the El Cerrito BART station, the

AC express bus line on San Pablo Avenue and the layout of existing commercial districts provide promising PTOD opportunities.

Encouraging mixed-use, pedestrian- and transit-oriented development along San Pablo Avenue and Solano Avenue could transform these commercial districts into vibrant transit corridors. Locating high quality residential development and a diversity of retail and commercial uses in these corridors will improve transit as additional residents, shoppers, and employees increase transit ridership and fare box revenue.

Albany encourages high density mixed-use development in both the San Pablo and Solano Commercial districts. The San Pablo district allows mixed use projects with a floor area ratio up to 2.25 and the Solano district allows floor area ratios up to 1.25. While these policies support PTOD, some of the City's current development standards, including parking requirements, height limits, and setback requirements establish barriers to such projects.

The following measures seek to remove barriers, create incentives, and stimulate public support for additional mixed-use pedestrian- and transit-oriented projects in Albany.

Measure TL 3.1: Provide public education about benefits of well-designed, higher-density housing and relationships between land use and transportation.

Achieving higher-density mixed-use development in the San Pablo Avenue and Solano Avenue Commercial zoning districts will require widespread community support. The City will consult with current residents, businesses, and property owners to build understanding about the benefits of well designed infill development. The City will also conduct workshops that aim to incorporate public input and concerns into the design of these areas.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
70 (combined total for all education programs)	$2,700	$40	No

Action		Timetables	Responsibility
A	Develop comprehensive public outreach campaign that educates residents and businesses about ways to reduce GHG emissions.	Before July 31, 2010	Environmental Resources
B	Develop specific outreach program to inform residents, businesses, and property owners about the benefits of well designed infill development.	Before January 1, 2011 (Ongoing)	Environmental Resources
C	Conduct workshops that integrate public input and concerns into the infill development design process.	Before January 1, 2011 (Ongoing)	Planning & Zoning Environmental Resources
Progress Indicators		**Target**	
i	NA	NA	

Measure TL 3.2: Update planning documents to promote high-quality, mixed-use, pedestrian- and transit-oriented development in the San Pablo/Solano Commercial district.

To successfully encourage the development of high-quality mixed use pedestrian- and transit-oriented development along San Pablo Avenue and Solano Avenue, the City will revise existing development standards and design guidelines. The City will conduct a sustainability audit to identify additional regulatory, structural, or market barriers that may prevent or discourage sustainable, climate-friendly development within commercial and high density residential zoning districts.

Specifically, the City will reevaluate the residential and commercial parking requirements (Measure D) for commercial and high density residential uses. Building heights will comply with current code requirements. The City will also update the San Pablo Design Guidelines and the San Pablo Avenue Streetscape Master Plan in order to reflect a desire to create a mixed-use and pedestrian- and transit-oriented environment.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
790	$3,800	$5	No

Action		Timetables	Responsibility
A	Conduct sustainability audit to identify regulatory, structural, or market barriers to sustainable, climate-friendly development within commercial and high density residential districts.	Before December 31, 2011	Planning & Zoning (General Plan Update)
B	Evaluate the residential and commercial parking requirements and the height and setback requirements for commercial and high density residential uses.	Before December 31, 2011	Planning & Zoning (General Plan Update)
C	Update the San Pablo Design Guidelines and San Pablo Streetscape Master Plan to reflect the City's desire to create a pedestrian- and transit-oriented environment.	Before January 1, 2013	Planning & Zoning

Progress Indicators		Target
i	Percentage of new development projects in San Pablo Commercial District that achieve a floor area ratio of 1.5 or higher (approximately 75% of maximum allowable FAR).	100% by 2020
ii	Percentage of new development projects in Solano Commercial District that achieve a floor area ratio of 0.95 or higher (approximately 75% of maximum allowable FAR).	100% by 2020

Measure TL 3.3: Evaluate GHG emissions associated with development proposals and work with applicants to reduce emissions during project review and incentivize projects that generate low levels of GHG emissions.

The City will employ tools to evaluate the GHG emission performance of proposed development projects (e.g. Urban Emissions Model [URBEMIS], Index). City staff will work with applicants to reduce GHG emissions through project design and mitigation during or prior to the project entitlement process.

Additionally, the City will provide incentives for infill development projects that result in low levels of GHG emissions. The City will explore establishment of a carbon feebate program, which establishes an emission target for new development

Measure TL 3.3: Evaluate GHG emissions associated with development proposals and work with applicants to reduce emissions during project review and incentivize projects that generate low levels of GHG emissions.

and charges fees to projects that produce higher than target emissions and provides financial incentives for projects that generate lower than target emissions.

The City would be able to capture most, if not all, of its up-front nexus study through an overhead for the application of the feebate program. The intent of the feebate program is not to pay for mitigations elsewhere in Albany, but rather to incentivize the project itself to incorporate more sustainable design elements that reduces its energy and water consumption.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Supporting measure (TL-3.2)	1k-45k	-	Yes

Objective TL-4:

Reduce Vehicle Emissions and Trips

To successfully reduce Albany's vehicle emissions, a variety of changes are required at the city, regional, state, and national levels. Vehicle GHG emissions are a function of vehicle miles traveled (VMT), vehicle efficiency, and the carbon content of a given fuel or alternative power source. While the City cannot control vehicle efficiency or fuel carbon content, the State and the federal government are both requiring considerable improvements in these areas. The City can incentivize the use of efficient vehicles, facilitate ridesharing, and increase the use of alternative travel modes. More fundamentally, the City can determine local land use and development patterns, which directly influence VMT. The following measures describe planned City efforts to reduce both vehicle emissions and trip lengths.

Measure TL 4.1: Work with ABAG and neighboring cities to improve the jobs-housing balance within the City and regional transit corridors.

Improving Albany's jobs/housing ratio will increase the number of employment opportunities in the City. This could create opportunities for shorter commutes for residents, reduce VMT, and increase residents' ability to walk or bicycle to work.

Communities with jobs/housing ratios close to 1.0 are considered balanced. In order to increase Albany's jobs/housing ratio from 0.7 to 0.8, approximately 1,100 jobs would need to be created by 2020. Association of Bay Area Governments (ABAG) employment projections indicate that approximately 600 jobs are likely to be created in this time period. In order to achieve an increase of 1,100 jobs, the City will increase employment development efforts. The City will also collaborate with neighboring cities to encourage job development opportunities in areas along existing public transit corridors accessible to Albany residents.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
225	$1,300	$6	No

Measure TL 4.1:	Work with ABAG and neighboring cities to improve the jobs-housing balance within the City and regional transit corridors.		
Action		**Timetables**	**Responsibility**
A	Create an economic development program.	Before July 31, 2010	Community Development
B	Explore the redevelopment potential of Commercial Mixed Use District into a job-rich business park.	Before December 31, 2011	Planning & Zoning (General Plan Update)
C	Collaborate with neighboring communities to establish employment opportunities along transit corridors.	Before January 1, 2011	Planning & Zoning (General Plan Update)
Progress Indicators		**Target**	
i	Jobs/housing ratio.	0.70 by 2015 0.80 by 2020	

Measure TL 4.2: Improve fuel efficiency of the City vehicle fleet by purchasing low- or zero-emission vehicles when vehicles are retired from service.

The City will purchase highly efficient vehicle models when municipal fleet vehicles are retired. The City owns 28 gas- and diesel-powered vehicles. When retired, these will be replaced by zero- or low-emission models. Priority will be placed on plug-in electric vehicles when appropriate. Heavy-duty vehicles will be replaced by the most efficient and cost-effective vehicles suitable for the purpose. Emergency vehicles shall be exempt from this requirement.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
19	$72,800	$3,800	No

Measure TL 4.3: Incentivize electric and plug-in hybrid vehicles through development of automobile charging infrastructure and preferential street parking spaces.

The City will facilitate the use of electric/plug-in hybrid vehicles within the community by providing charging infrastructure and preferential parking spaces. The City will work with property owners to develop electric plug-in charging infrastructure in commercial and civic areas. Ideally, this infrastructure will source a considerable portion of its electricity from solar energy generation facilities located within the City in order to create a zero emission vehicle infrastructure.

Preferential street parking spaces for electric and plug-in electric vehicles will encourage residents, employees, and visitors to purchase low- or zero-emission vehicles and therefore assist the City in its efforts to reduce transportation-related emissions. The City will provide preferential parking spaces for eligible vehicle types within commercial districts at a ratio of one preferential space per 5 unrestricted parking spaces. The City will maintain a list of preferential parking-eligible vehicles on its website. Other vehicles parked in the spaces will be ticketed. The City will require new retail and office developments with private parking lots to provide preferential parking spaces at the same ratio.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not quantified	$1,300	-	No

Measure TL 4.4: Create and implement a voluntary transportation demand management (TDM) program to reduce weekday peak period single occupancy commute and school trips.

The City will establish a transportation demand management program to reduce single-occupancy automobile commute trips by at least 15% by 2020. In order to achieve this target, the City will facilitate establishment of an Albany Transportation Management Association (ATMA), a non-profit organization made up of Albany-based employers, whose primary purpose is to increase access and mobility to, from, and within the community for their employees. The ATMA will offer training seminars to help member employers develop effective commute option programs. Additionally, ATMA will provide members with benefits such as guaranteed ride-home services, rideshare databases, bulk transit pass purchases, and representation in local and regional transit/transportation planning processes. The City will attempt to partner with Berkeley and El Cerrito in developing this program in order to take advantage of scale efficiencies.

Additionally, the City will work with the ATMA, Metropolitan Transportation Commission (MTC) and other relevant agencies to maximize community participation in carpool and vanpool commuting. A core component of this effort will be the development of a social networking platform where residents and employees with similar commutes can find each other and create effective carpools. Additionally, the City will investigate the potential to create rideshare stations to facilitate resident participation in casual carpools.

A large portion of school children attending public and private schools in Albany are driven to school each day in private automobiles. The City will make essential infrastructure improvements to enable safe-routes-to-school. The City will also work with schools to create trip reduction programs that encourage walking, bicycling, carpooling, and public transit use. Specific attention will be placed on expanding the walking school bus programs throughout the community, where children walk to school in adult-supervised and school-coordinated groups.

The City will also work with the ATMA to conduct a variety of education and outreach programs aimed at reducing residents' transportation related emissions. Various media will be used to convey messages about alternative transportation options and climate-responsible vehicle purchasing. Targeted advertisement programs will be created to encourage walking and bicycling in the City. The City will partner with Carbon Neutral Albany, Strollers & Rollers, and other additional community based groups promoting climate action.

GHG Reduction Potential ($MT CO_2e$)	Cost to City	Cost Per Metric Ton	Private Cost
1,140	$10,000	$9	Yes

Action		Timetables	Responsibility
A	Develop and adopt a transportation demand management program to reduce single-occupancy automobile commute trips by 15% by 2020.	Before December 31, 2011	City Council Transportation
B	Facilitate the establishment of an Albany Transportation Management Association (ATMA) for community employers.	Before July 31, 2012	Transportation
C	Develop Albany-specific social networking platform to facilitate community participation in carpool and vanpool programs.	Before December 31, 2012	Transportation
D	Evaluate potential for rideshare stations in Albany.	Before December 31, 2012	Transportation
E	Work with schools to identify key infrastructure improvements and community outreach initiatives that would facilitate safe-routes-to-school and walking school bus programs.	Before July 31, 2011	Transportation

Measure TL 4.4:	Create and implement a voluntary transportation demand management (TDM) program to reduce weekday peak period single occupancy commute and school trips.		
F	Develop education and outreach programs aimed at reducing residents' transportation related emissions.	Ongoing	Transportation
Progress Indicators		**Target**	
i	Percent reduction in single-occupancy automobile commute trips.	15% reduction by 2015 20% reduction by 2020	
ii	Percentage of Albany employers with over 10 employees who belong to ATMA.	100% by 2015	

Measure TL 4.5:	Evaluate and consider implementation of community parking management strategies.

Parking management includes strategies that influence the supply, price and regulation of parking facilities. Parking management can have a considerable effect on a community's travel behavior by reducing driving and increasing use of other travel modes. The City will evaluate parking management strategies that have the potential to reduce automobile trips or enable the development of bicycling and walking infrastructure (e.g., bike lanes, traffic-calming measures).

GHG Reduction Potential (MT CO_2e)	**Cost to City**	**Cost Per Metric Ton**	**Private Cost**
Not quantified	$6,300	-	No

Objective TL-5:

Prepare for Peak Oil

Synergies exist between Albany's need to reduce GHG emissions for climate protection purposes and the need to guard the community from the potential impacts of peak oil. For decades, theorists have predicted that there will be a point in time when global petroleum extraction achieves a maximum, or peak, level. In this scenario global petroleum demand would outstrip production and the resulting shortage could lead to rapid price escalation, and creating havoc for a global economy that relies heavily on fossil fuels. In 2005, the United States Department of Energy (DOE) released a comprehensive report that validates many of these concerns and indicates that such a scenario is likely to occur within the next half-century, though the precise timing remains uncertain (DOE, 2005).

Increased fuel prices and reduced supply could considerably affect Albany residents and businesses. Potential effects could include higher transportation, food, heating, and other costs. Notably, private automobile travel costs may increase, affecting mobility options.

Fortunately, many of the measures proposed to reduce GHG emissions will also help the community prepare for peak oil. While climate change and peak oil are distinct issues, together they may provide a united urgency to inspire investments in alternative transportation infrastructure and support pedestrian- and transit-oriented development.

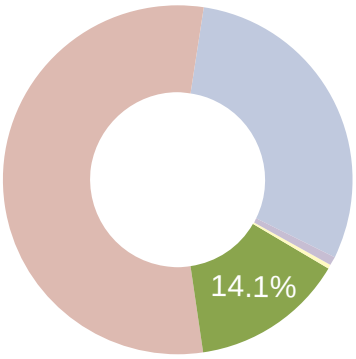
Measure TL 5.1:	Conduct a study of the potential effects of peak oil on the community and develop a peak oil adaptation plan.

The City will develop a comprehensive plan to prepare the community for potential effects of peak oil. The City will establish a specific task force to assess the community's vulnerability to peak oil and recommend specific actions. The task force will specifically look for strategies that can help reduce the effects of peak oil and reduce community GHGs.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not included in inventory	$1,300	-	Yes

Waste Reduction Strategy

Minimize waste.



Total GHG Emissions Reduced:
2,210 Metric Tons

Objectives:
WR-1: Become a Zero-Waste Community - 100%

While waste comprises only 5% of Albany's baseline GHG inventory compared to transportation or building energy, the City and the Alameda County Waste Management Authority and Source Reduction and Recycling Board (operating together as StopWaste.org) can eliminate most waste-related emissions by 2030.

Background

How waste generates GHG emissions

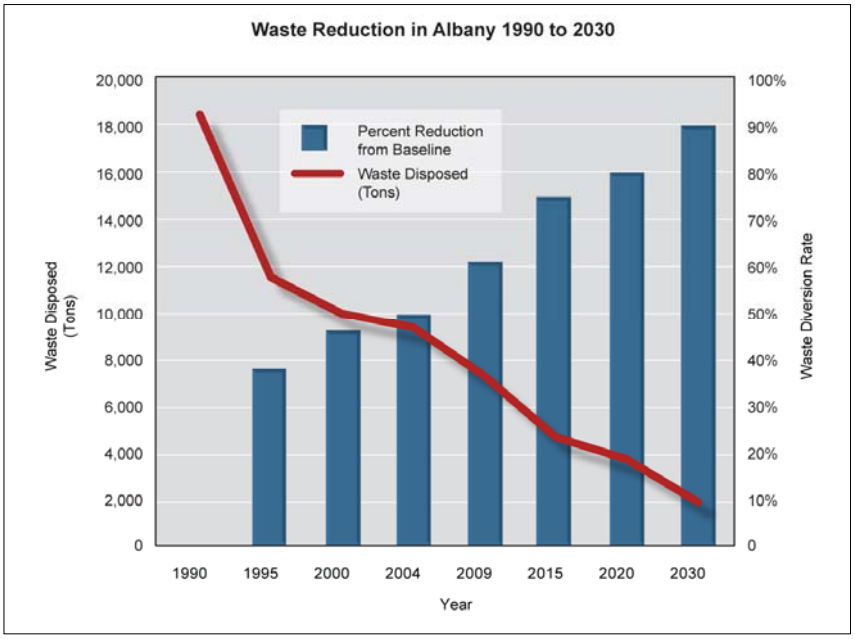
In nature, waste is comprised of food and nutrients flowing in a cyclical pattern. When a leaf falls from a tree to the forest floor it becomes food for insects and microbes, and eventually turns back into nutrients for new plant growth. In modern times, humans have established linear waste flows where materials are extracted, processed, used, and then discarded into landfills or incinerated. These linear waste flows create GHG emissions in three ways:

- **Landfills:** Each year, Americans throw away 84.2 million tons of biodegradable food scraps, yard trimmings and paper products (EPA 2006). These organic materials breakdown in anaerobic landfills and emit methane, a potent GHG.
- **Waste incineration:** Americans burn 31.4 million tons of municipal solid waste annually (EPA 2006). While most waste incinerators also produce electricity, they emit considerably more CO_2 per megawatt hour than fossil fuel power plants.
- **Lifecycle considerations:** Each year Americans bury or burn 123 million tons of manufactured commodities such as paper, metals, plastics, and glass. Instead of reusing these discarded materials, virgin materials are mined or harvested to produce the next round of consumable goods. Continuous consumption of virgin materials requires tremendous amounts of energy. The lifecycle energy invested in extracting and processing virgin materials is responsible for a large amount of GHG emissions. In addition to being energy intensive, the extraction of virgin materials is one of the main causes of deforestation, which accounts for as much as 30% of global GHG emissions.

Only landfill-generated emissions are included within Albany's 2005 baseline inventory and contribute to the City's reduction goals. While reducing lifecycle emissions is critically important to addressing climate change, the City will not be able to take credit for actions that reduce these emissions.

Waste Reduction in Albany

In 1989, the California State legislature signed the Integrated Waste Management Act (AB 939) into law, mandating cities and counties to divert 50% of their waste flows from disposal by 2000. Since 1976, StopWaste.org has been a national leader in waste reduction and diversion. In cooperation with Alameda County, the City has taken meaningful steps to reduce waste generation over the past two decades. In 1990, Albany landfilled approximately 18,500 tons of garbage. By 2004, the City had reduced this to 9,300 tons, achieving the 50% reduction from 1990 levels.



In 2007, the City established a 75% waste reduction goal for 2010. Between 2004 and 2009, Albany eliminated an additional 2,100 tons and achieved a 61% reduction below 1990 levels. The 2004 to 2009 reductions have removed approximately 840 MT of GHG emissions from the City's baseline GHG inventory. These reductions have been counted as an achievement toward the City's GHG reduction target.

Toward Zero Waste

Looking ahead, leading waste management experts envision a future where society produces zero waste. In this future, all synthetic materials are recycled over and over again as the same material and all biological materials are composted and returned to the soil. If we successfully transition to producing zero waste, landfills and incineration would become essentially obsolete. Lifecycle considerations would also decrease as the extraction of virgin materials greatly decreases. Waste-related GHG emissions would be considerably reduced.

While the technical capacity to reduce waste generation by 90% in a cost-effective manner exists, implementation may take more than a decade. If Albany were to increase recycling, composting, and source reduction at a rate of one percent per year, an 80% reduction in waste generation could be achieved by 2020, and a 90% reduction could be achieved by 2030.

Consumer Choice and Behavior

As consumers of goods and services, we can all play an important role in reducing GHG emissions. The amount and types of things we consume greatly determines our personal impact on the climate. Lowering our consumption levels and purchasing climate-friendly products can substantially reduce individual GHG emissions.

The simplest way to reduce personal emissions is to consume less. Almost everything we buy generates emissions as it is transformed from raw material into a finished product. By not purchasing a product, we eliminate the energy consumption and other environmental effects associated with activities such as mining, manufacturing, transporting, and marketing.

When we do decide to purchase a product or service, selecting a climate-friendly alternative can help reduce associated GHG emissions. Selecting a product with low embodied emissions takes some effort, but information to help consumers make informed choices is increasingly available. Reusing or purchasing secondhand items is also a great way to reduce GHG emissions. Sharing goods with friends and neighbors is another way to reduce both GHG emissions and cost.

At stated above, most lifecycle emissions were not included in Albany's 2005 baseline emissions inventory. For this reason the City cannot apply lifecycle emissions reductions to the achievement of the 2020 target. While this is the case, this does not diminish the importance of reducing consumption and purchasing climate-friendly products.

Objective WR-1:

Become a Zero-Waste Community

Albany recognizes that moving to a zero-waste culture is a critical step toward reducing a wide range of environmental effects, including the community's GHG emissions. The City's waste reduction measures build on existing efforts and focus on reducing GHG emissions by eliminating waste at its source while also maximizing recycling and composting in homes, businesses, and civic institutions.

Expanded waste prevention and recycling programs will make important contributions to reducing energy needs for manufacturing, packaging, and shipping virgin products. Expanded composting programs will reduce methane produced in landfills and improve the productivity of local agriculture. Albany will join other cities to

encourage the State and the federal government to adopt extended producer responsibility legislation that holds manufacturers accountable for their products and packaging through their full lifecycle. Manufacturers would, in turn, design products from materials that can be easily recycled or composted. Successful extended producer responsibility legislation is critical to achieving Albany's zero-waste goal. Well-informed consumers can considerably reduce the lifecycle GHG emissions associated with the goods and services they purchase. The City will create educational programs that raise awareness about products total carbon footprint. The City will also promote reuse and sharing of goods within the community.

Measure WR 1.1: Establish a citywide zero-waste target for 2030.

The City will adopt a resolution to achieve 90% waste diversion by 2030. Achieving this aggressive target will require full participation from residents and businesses and collaboration with StopWaste.org and neighboring cities. The 2008 Stopwaste.org Waste Characterization Study identified that a significant amount of organics, compostable paper, and plastics are being disposed of as trash. The City will adopt ordinances and conduct a variety of outreach programs to increase community participation in waste reduction, recycling, and composting programs.

The City will place special focus on the diversion of food waste and other organic materials the primary source of landfill methane emissions. The City will adopt an ordinance requiring all household and commercial food scraps and food soiled paper to be placed in organics carts, and all commercial food service providers to use both recycling and organics services. EBMUD currently uses food waste to produce biogas at its West Oakland wastewater treatment facility. The biogas produced provides a portion of the plant's energy. The City of Berkeley is actively developing a food industry grease-to-biodiesel processing program. The City of Albany will partner with these agencies to establish a viable food waste-to-bioenergy program for restaurants, caterers, and related businesses.

The City will adopt an ordinance that requires the waste collection contractor to minimize collection route distances and use fuel-efficient vehicles, an ordinance requiring a disposable shopping bag fee, and an ordinance that directs the City to eliminate all unnecessary paper use in municipal operations. The City will also consider establishing a trash tax on the volume of waste collected to help fund a high level of waste reduction in the city.

Outreach programs will focus on raising consumer awareness about low carbon product alternatives, reducing unnecessary consumption, and promoting the reuse and sharing of goods within the community. The City will make efforts to increase resident's awareness about alternative products that are produced using renewable energy, sustainable forest management practices, and materials and processes with low embodied energy. Albany will continue the community garage sale and support the establishment of a used-goods retail or exchange facility within Albany.

Furthermore, the City will urge the State and the federal government to pass legislation that requires extended producer responsibility and improves the recyclability of products and packaging.

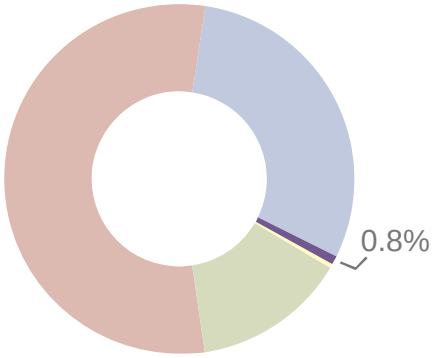
GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
2,210 Metric Tons (2004 to 2020)	$1,300	$1	No

	Action	Timetables	Responsibility
A	Adopt a resolution to achieve 90% waste diversion by 2030.	Before December 31, 2011	City Council Environmental Resources
B	Adopt an ordinance that requires all household and commercial food scraps and food-soiled paper to be placed in organics carts, all commercial food service providers to use recycling and organics services.	Before December 31, 2010	City Council Environmental Resources
C	Adopt an ordinance that requires the City's waste collector to minimize collection route distances and use fuel efficient vehicles.	Before December 31, 2010	City Council Environmental Resources

Measure WR 1.1:	Establish a citywide zero-waste target for 2030.		
D	Expand outreach programs to maximize participation in waste reduction and diversion programs and increase consumer awareness about low carbon products and opportunities for reuse of goods in the community.	Before July 31, 2011	Environmental Resources
E	Adopt an ordinance that requires a disposable shopping bag fee.	Before December 31, 2010	City Council Environmental Resources
F	Adopt a resolution of support that encourages the State and federal governments to create a voluntary *Do Not Mail Registry* to reduce junk mail deliveries.	Before July 31, 2010	City Council Environmental Resources
G	Develop a resolution of support to encourage the State and the federal government to pass legislation that requires extended producer responsibility and improves recyclability of products and packaging.	Before December 31, 2010	City Council Environmental Resources
Progress Indicators		**Target**	
i	Community waste diversion rate	75% by 2015 80% by 2020 90% by 2030	

Green Infrastructure Strategy

Enhance natural assets that improve community quality of life.



Total GHG Emissions Reduced:
130 Metric Tons

Objectives:

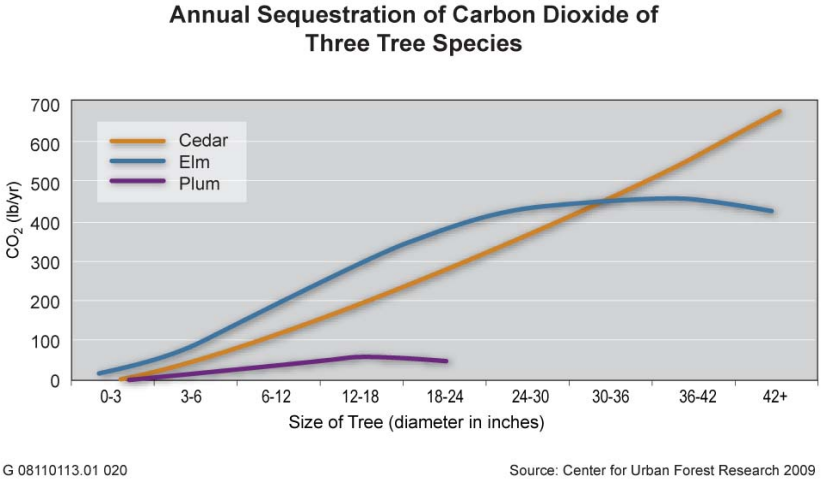
GI-1: Expand and Enhance City's Green Infrastructure - 100%

Green infrastructure refers to a wide variety of natural features that, when integrated within an urban environment, provide valuable ecosystem services to the community. In Albany, green infrastructure includes the urban forest, bayshore and riparian habitat areas, and other natural stormwater-absorbing landscapes. Green infrastructure benefits the City by improving local energy security, stormwater and waste management, and public health. The measures contained within this strategy describe green infrastructure improvements capable of reducing GHG emissions or sequestering carbon within plant biomass.

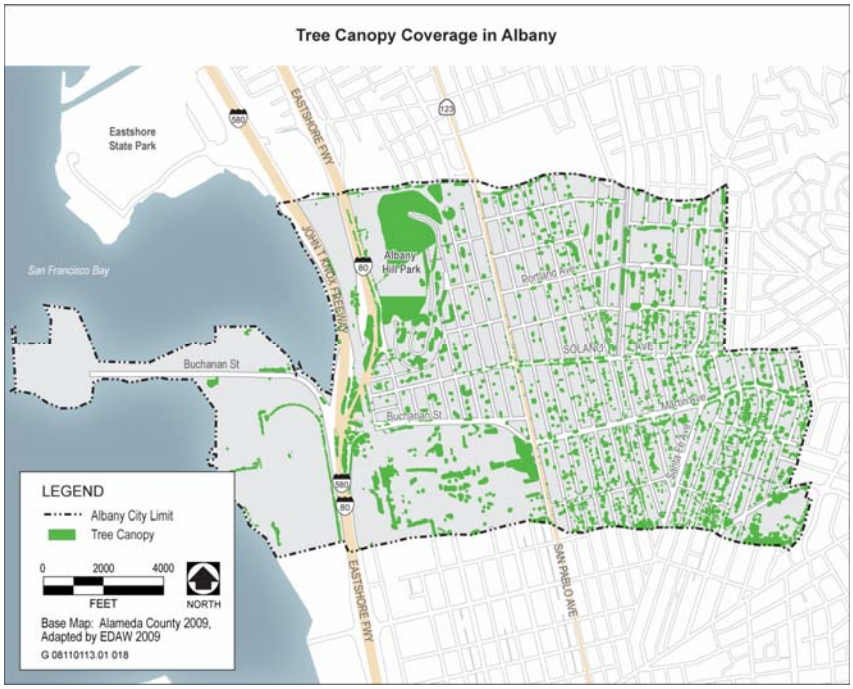
Background

Albany's Urban Forest

The City recognizes trees as a valuable asset. Albany has established an Urban Forestry Program to plant and maintain trees on public lands and rights-of-way. Trees beautify neighborhoods, increase property values, reduce noise and air pollution, keep buildings cool in the summer, create privacy, and establish habitat for bird species. Importantly, the urban forest also sequesters carbon as the trees grow.



Considerable variations in tree canopy coverage are found in different portions of the City. Areas with moderate canopy coverage include the Albany Hill area, parks, and in residential neighborhoods in the eastern and southeastern portions of Albany. Canopy coverage is generally lacking along San Pablo Avenue and in adjacent neighborhoods. This and many other areas of the City would benefit from additional tree plantings.



The City estimates that the Urban Forestry Program currently plants approximately 150 trees per year. Program staff have identified that a large number of potential tree planting sites exist within the City, and that with additional funding, Albany's urban forest could be considerably enhanced.

Urban Forest Carbon Sequestration and GHG Reductions

Trees can help the City achieve its GHG reduction target by sequestering carbon and by reducing building energy-related emissions. 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. Additionally, trees gain carbon-capturing biomass as they grow. In Albany's coastal ocean-moderated climate, carbon sequestration can be expected to provide the majority of a tree's GHG reduction capacity. As summertime temperatures increase as a result of climate change, the building energy savings potential of the urban forest may become increasing important.

Tree species is another important factor that determines the GHG reduction capacity of Albany's urban forest. Large species achieve significantly more sequestration capacity than smaller species. Additionally, trees with larger canopies and dense foliage provide more shade than other species. Large, deciduous species are ideal for reducing building energy as they provide shade in summer, but allow winter sunlight into buildings for passive solar gain in cooler weather.

Objective GI-1:

Expand and Enhance the City's Green Infrastructure

Expanding green infrastructure in Albany will provide a wide range of benefits. The urban forest and other landscapes will sequester carbon and contribute to the achievement of the City's emissions reduction goals. The improvements will also benefit other community sustainability objectives, including stormwater management, and streetscape enhancement.

Measure GI 1.1: Enhance the community's urban forest and other landscapes to maximize carbon sequestration, reduce stormwater runoff, and augment neighborhood aesthetics.

The City will facilitate the expansion of the community's urban forest and other green infrastructure in the community. The City will Prepare a Green Albany Plan to evaluate all potential "growing areas", including parks, streets, rights- of-way, parking lots, and rooftops, for carbon sequestration. The City will seek additional funding for the Urban Forestry Program to increase both tree planting and maintenance capacity, and will seek volunteer assistance to implement the program. In order to achieve the estimated GHG reductions, 5,000 new trees should be planted between 2010 and 2020. The City will set a goal to plant 500 new trees per year during this 10-year timeframe. Additional outreach to property owners and neighborhood organizations will be an important component in achieving this target. The City will encourage planting species known to provide high levels of sequestration.

The City will also establish a Green Streets program that works to reduce and/or eliminate concrete, asphalt, and other impermeable surfaces. The program will improve tree health, reduce stormwater pollution, and enhance the aesthetics of the community's neighborhoods. The City will establish guidelines for retrofitting existing streets into green streets and will identify priority streets for pilot projects. Green street retrofits must be coordinated with sewer system repairs to avoid further infiltration and inflow into Albany's wastewater treatment system.

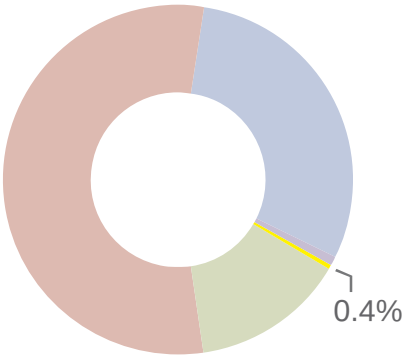
GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
130	$21,000	$160	No

Action		Timetables	Responsibility
A	Prepare a Green Albany Plan to evaluate all potential areas (e.g. parks, streets, rights-of-way, parking lots, and rooftops) for carbon sequestration.	Before December 31, 2012	Urban Forestry Environmental Resources
B	Seek Urban Forestry Program funding to support increased tree planting and maintenance capacity.	Before July 31, 2010	City Council Urban Forestry

Measure GI 1.1:	Enhance the community's urban forest and other landscapes to maximize carbon sequestration, reduce stormwater runoff, and augment neighborhood aesthetics.		
C	Plant 500 new trees per year.	Ongoing	Urban Forestry
D	Develop outreach program to encourage residents and businesses to plant additional trees and other carbon sequestering landscapes on private property.	Before July 31, 2011	Urban Forestry Environmental Resources
E	Explore potential for undergrounding utility lines to facilitate planting of larger species of street trees.	Before December 31, 2012	Urban Forestry Public Works
F	Develop a Green Streets Program to identify priority streets for pilot green street retrofit projects.	Before July 31, 2014	Public Works Urban Forestry Environmental Resources
Progress Indicators		**Target**	
i	Number of trees planted per year.	500 trees per year	
ii	Number of total trees planted.	5,000 by 2020	

Water Conservation Strategy

Celebrate water as an essential community resource.



Total GHG Emissions Reduced:
55 Metric Tons

Objectives:

WC-1: Conserve Water in Existing Buildings and Landscapes - 18%

WC-2: Conserve Water in New Buildings and Landscapes - 82%

Water conservation measures protect the region's limited water resources, conserve energy, and reduce GHG emissions. A considerable amount of energy is used every day to pump, treat, transport, heat, and cool the water we consume. Additionally, almost all water used in homes and businesses is eventually treated as wastewater, requiring further energy inputs. The City's water conservation strategy seeks to reduce both water consumption and wastewater production in Albany's residential, commercial, and civic buildings and properties.

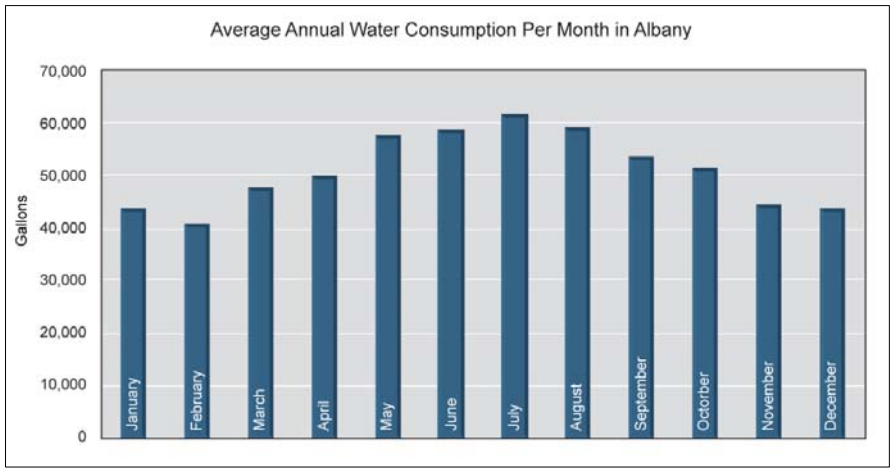
In addition to GHG emissions reductions, water conservation also allows the community to adapt to a future where climate change effects may threaten water supply. EBMUD has studied the potential effects of climate

change variables on both water supply and on the utility's extensive storage and distribution infrastructure. In general, EBMUD water supplies are most vulnerable to a potential shift in the timing of springtime runoff from the April-to-July period to winter months, and to decreases in annual runoff volumes (EBMUD 2009).
In response to potential future decreases in annual precipitation, EBMUD would likely increase water rationing in Albany. By implementing water conservation measures in this CAP, Albany may limit the extent and duration of future water rationing caused by climate change.

Background

Water Consumption

EBMUD is the City's water utility. Within EBMUD's jurisdiction, residential uses create 63% of total water demand. Commercial uses comprise 14%, and industrial and all other uses comprise 23%. While water conservation is important across all sectors, residential water demand plays the most critical role in the City's water demand management efforts.



Residential water use consists of indoor and outdoor applications. The ratio of indoor to outdoor water use is related to both housing type and the size of a residential lot. The average East Bay single-family residence uses approximately 62% of its water indoors, and 38% outdoors. Multi-family units use considerably less water per unit outdoors since multi-family yards are smaller and often shared with other tenants. Indoor water use comprises 86% and irrigation comprises 14% of multi-family water demand.

Indoor Residential Water Use

In the average Albany household, toilets use the largest amount of water, followed closely by clothes washers, showers, and faucets. Water leaks account for approximately 8% of all water use. With relatively minor upgrades to faucets, fixtures and other appliances, Albany could conserve considerable amounts of water.

Irrigation

Outdoor irrigation constitutes an important part of Albany's water demand. Water use in the City fluctuates by about 30% between wet and dry portions of the year. In late spring, soils dry up and many landscapes require watering to support plants that are poorly adapted to Albany's Mediterranean climate. If more native plant species were used in landscaping irrigated by graywater and rainwater collection systems, considerable amounts of water could be conserved.

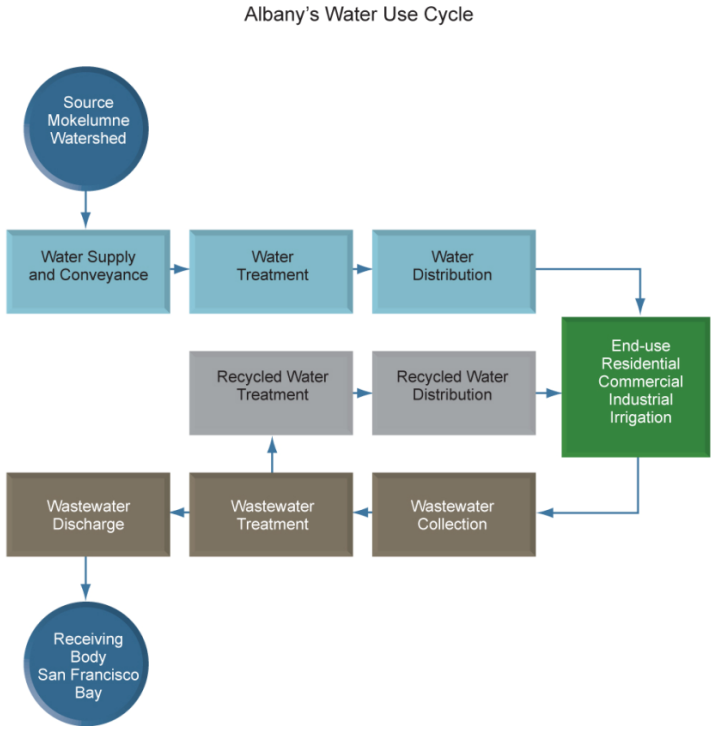
In 2006, Albany adopted an ordinance requiring use of Bay-Friendly Landscape practices on all municipal properties. The Bay-Friendly Landscape guidelines promote a wide array of techniques that conserve water and improve water quality including integrated pest management techniques, low flow irrigation systems, and the incorporation of native drought tolerant plants. The ordinance also encourages Albany residents and businesses to apply these techniques to private landscapes.

Albany's Water System and Associated GHG Emissions

For explanatory purposes, Albany's water system can be separated into three distinct components: delivery, end-use, and post-processing.

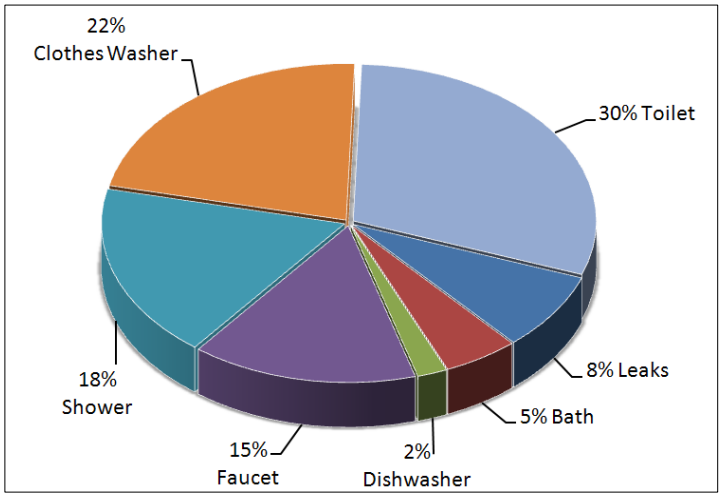
Delivery

EBMUD has one of the most energy-efficient water delivery systems in California. EBMUD receives 95% of its water from the Mokelumne River in the Sierra Nevada and water is conveyed by gravity through aqueducts to the East Bay. This gravity-driven conveyance system uses little energy. Because Mokelumne River water is of relatively high quality, it requires minimal treatment. As EBMUD's treatment facilities are located high in the East Bay hills, the elevation difference between the treatment facilities and end users pressurizes the distribution system, again requiring relatively little energy to deliver water to customers.



End-use

After water is delivered to EBMUD customers, it is used for a variety of purposes, using the majority of water-related energy. Residential uses include bathing, dish and clothes washing, toilets, and landscape irrigation. Energy is used during domestic water treatment (filtering and softening), heating (natural gas or electric water heaters), hot water circulation, and cooling (icemakers and chilled water systems for HVAC and chilled drinking water) processes. Some of the more energy-intensive applications specifically related to commercial or industrial water use includes supplemental pressurization, car and truck washing, process hot water and steam production, process chilling, equipment cooling, and cooling towers.



Post-Processing

EBMUD also provides the City's wastewater treatment, which uses the second largest amount of water-related energy. Other than water used in landscape irrigation or lost through evaporation, all water used within Albany is ultimately processed at EBMUD's wastewater treatment plant. The average wastewater facility uses about 1,050 kWh/million gallons to treat the wastewater to the point that it can be disposed of into a receiving water body such as San Francisco Bay. If wastewater is recycled for use in irrigation or industrial processes, an

additional 500 kWh to 2,000 kWh/million gallons can be required for supplementary treatment and pumping the water to its final application.

Due to this additional energy demand and the low energy intensity of EBMUD's potable water delivery system, using recycled water may result in considerably more energy demand and produce more GHGs than if potable water were used for irrigation or industrial purposes. However, using recycled water provides valuable water conservation benefits; therefore the City must balance GHG emissions reductions with water supply considerations.

EBMUD Water Rebates and Efficiency Programs

EBMUD currently offers its customers a variety of water rebates and efficiency programs. Rebate offers for residential customers include high-efficiency clothes washers, landscape irrigation systems, high-efficiency toilets, and other household water-using devices. A landscape rebate program is available to single-family residential customers that convert their irrigated lawns into more sustainable landscapes. Large non-residential water users may be eligible for commercial rebates of up to 50% of the cost of new landscape irrigation hardware. EBMUD also offers several free conservation devices to its customers, including faucet aerators and water-conserving showerheads. All EBMUD customers may take advantage of free on-site water surveys of indoor and landscape water use. Water surveys assess existing water fixtures and irrigation systems and provide recommendations for water-saving upgrades and educational materials on rebate programs.

Graywater and Rainwater Collection

Graywater and rainwater collection systems can be effective alternatives to using potable water for irrigation. Graywater systems use untreated household wastewater from bathtubs, showers, bathroom wash basins, and clothes washing machines. Using wastewater from kitchen sinks, dishwashers, or toilets is not allowed. In the East Bay, graywater makes up approximately 45% of a single-family home's wastewater output (EBMUD 2005). Incorporating graywater systems within homes and commercial buildings would eliminate this wastewater load and reduce Albany's water-related GHG emissions.

Current California law permits use of graywater systems for subsurface irrigation so long as they comply with Title 24, Part 5 of the California Plumbing Code. Further liberalization of graywater systems would be expected if SB 1258 (2009 legislative session) is approved. Though local governments retain the authority to prohibit graywater systems, the State encourages jurisdictions to permit compliant systems. To date, Albany has not approved the construction of graywater systems.

Rainwater is collected from roofs and other impermeable surfaces and stored in cisterns or barrels for use in dry weather irrigation. Rainwater can be used for either sub-surface or surface irrigation. Rainwater collection is currently practiced by some households in Albany informally using gutters connected to collection barrels. Larger rainwater collection systems use cisterns that require higher levels of design and engineering. In Albany, rainwater collection systems would result in minimal GHG emission reductions, as using rainwater in place of potable water only avoids water delivery-related energy use.

Objective WC-1:

Conserve Water in Existing Buildings /Landscapes

Water is one of Albany's most important and most constrained resources. Conserving water is an important community priority in its own right. When evaluated from the perspective of cost-per-metric ton of GHG emissions reduced, water conservation would not appear to provide the community with much benefit. The City has chosen to include these measures due to their combined water conservation and GHG reduction benefits. The City recognizes that water conservation will become increasingly important if climate change decreases available water supplies.

Most of Albany's residential and commercial buildings are more than 30 years old. Water fixtures and appliances have improved considerably since that time, and replacing antiquated equipment would result in valuable water conservation benefits. Additionally, leaking pipes and faucets account for approximately 8% of water consumption in older buildings. The following measures seek to maximize water conservation in the community's existing buildings and landscapes.

Measure WC 1.1: Encourage residential and commercial users to participate in EBMUD's free water audit program.

The City will partner with EBMUD and Stopwaste.org to provide water conservation outreach programs and will encourage residential and commercial users to participate in free water efficiency audits. This program also will encourage residents and landlords to update water fixtures and fixture fittings and repair leaks within their building water systems. The program will encourage property owners to increase water efficiency by 20% or greater.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
5	$2,700	$540	Yes

	Action	Timetables	Responsibility
A	Partner with PG&E and Stopwaste.org to create water efficiency programs and ensure specific focus on indoor fixture and fixture fitting retrofits.	Before December 31, 2010	City Council Environmental Resources Building

	Progress Indicators	Target
i	Percentage of residential units and businesses that have voluntarily implemented fixture and fixture fitting efficiency improvements since 2004.	10% by 2020

Measure WC 1.2: Encourage 50% reduction in outdoor potable water usage for existing residential and commercial properties.

The City will create outreach and educational programs to encourage existing residential and commercial properties to reduce outdoor potable water use by 50%. Methods to be promoted by the City include: climate-appropriate landscaping, efficient irrigation systems, rainwater capture, and the use of graywater.

The use of climate-appropriate landscaping is already encouraged through the City's adopted Bay-Friendly Landscaping Ordinance. To further participation, the City will adopt an ordinance enabling property owners to construct rainwater

Measure WC 1.2:	Encourage 50% reduction in outdoor potable water usage for existing residential and commercial properties.

collection and graywater systems conforming to Title 24 Part 5 of the California Plumbing Code. The City will also provide public outreach that educates residents and businesses about the opportunities to construct graywater and rainwater collection systems on their properties. City Planning and Building staff will be trained to help interested parties understand the State code requirements for graywater systems.

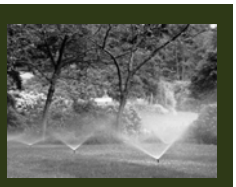
The City will also develop a program to encourage the use of weather-based evapotranspiration (ET) controller irrigation systems in private landscapes. The City will install ET controllers in all municipal landscapes. ET irrigation systems analyze soil moisture content and irrigate only when plants need water. These systems optimize irrigation efficiency and avoid over watering. Studies demonstrate that such systems can reduce residential landscape irrigation by 16% (City of Irvine, 2001).

GHG Reduction Potential (MT CO_2e)	**Cost to City**	**Cost Per Metric Ton**	**Private Cost**
5	$2,700	$540	Yes

Action		**Timetables**	**Responsibility**
A	Partner with EBMUD and Stopwaste.org to create water efficiency programs and ensure specific focus on outdoor potable water conservation practices.	Before December 31, 2010	City Council Environmental Resources Building
B	Install weather-based ET controller irrigation systems in all municipal landscapes.	Before July 31, 2015	Public Works Recreation
Progress Indicators		**Target**	
i	Percentage of residential and businesses that have voluntarily increased outdoor water conservation by 50% or more since 2004.	10% by 2020	

Objective WC-2:

Conserve Water in New Construction/Landscapes



The City's adopted Green Building Ordinance (2007) does not contain explicit water efficiency standards. Such standards will be important to ensure that water consumption and water-related GHG emissions are minimized in future construction. For this reason, the City will revise the municipal code to adopt the water efficiency standards contained in the 2008 California Green Building Code (CGBC).

Adoption of the CGBC water efficiency standards, into the City Green Building Ordinance will provide for a 20% increase in indoor water efficiency above the current California Building Standards Code, and a 50% increase in outdoor water use efficiency above the California Model Water Efficient Landscape Ordinance.

Measure WC 2.1:	Require new construction and major remodels to achieve indoor water efficiency 20% above the California Building Standards Code.

The City will amend the existing Albany Green Building Ordinance to require plumbing fixtures and fixture fittings that reduce the indoor water use by 20% as described in Section 603.2 of the 2008 California Green Building Code (CGBC). The reduction shall be based on the maximum allowable water use per plumbing fixture and fittings as required by the California Building Standards Code. Costs to Albany homeowners for these upgrades are estimated to be low.

GHG Reduction Potential (MT CO_2e)	**Cost to City**	**Cost Per Metric Ton**	**Private Cost**
25	$1,300	$50	Yes

Action		**Timetables**	**Responsibility**
A	Update Building Code to require all new construction and remodels to improve the water efficiency of fixtures and fixture fittings by 20% above the California Building Standards water efficiency standards.	Before December 31, 2010	City Council Building

Progress Indicators		**Target**
i	NA	NA

Measure WC 2.2:	Require new landscape projects to reduce outdoor potable water use by 50%.

The City will amend the existing Albany Green Building Ordinance to require new landscape projects to provide water efficient landscape irrigation design that reduces potable water use by 50% below the initial requirements for plant installation and establishment as identified in Section 604.2 of the CGBC. A new landscape project is to be defined as all landscape designs associated with new construction or any landscape project over 2,500 square feet in size.
The use of climate-appropriate landscaping is already encouraged through the City's adopted Bay-Friendly Landscaping Ordinance.

GHG Reduction Potential (MT CO_2e)	**Cost to City**	**Cost Per Metric Ton**	**Private Cost**
20	$1,300	$70	Yes

Action		**Timetables**	**Responsibility**
A	Update Building Code to require new landscape projects to reduce outdoor potable water use by 50% below the initial requirements for plant installation and establishment as identified in Section 604.2 of the CGBC.	Before December 31, 2010	City Council Building

Progress Indicators		**Target**
i	NA	NA

Food and Agriculture Strategy

Create a sustainable and climate-friendly food system.

Food and agricultural systems are responsible for a large amount of global GHG emissions. In the United States, agriculture, food processing, transportation, and distribution rely heavily on fossil fuels. Food that is grown out-of-season and transported by air results in high levels of emissions. Energy inputs increase for foods higher up the food chain and for highly processed products. Additionally, the livestock and dairy industries generate large quantities of methane gas as a natural byproduct, and other agricultural fertilizers release nitrous oxide into the atmosphere. Unconsumed, wasted food sent to the landfill also creates methane emissions.

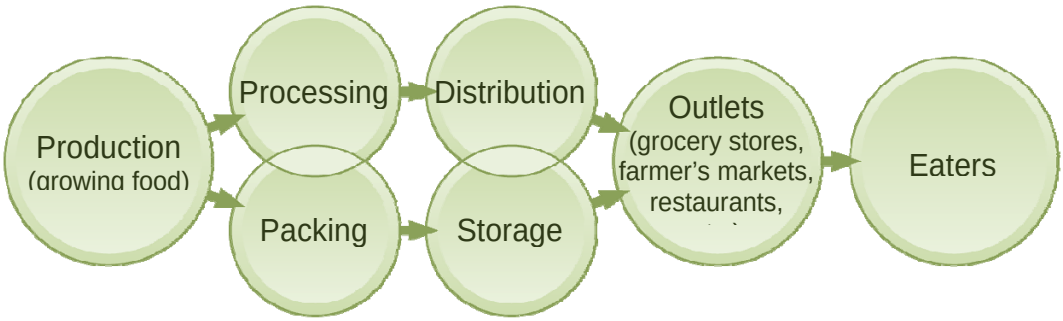
By making more informed choices about the types of food we eat, how it is produced, and where it is grown, we can reduce our GHG emissions and contribute to regional agricultural viability. While improving the ways in which we produce and consume food will reduce GHG emissions, these reductions cannot be applied to the community's reduction target as most food-related emissions occur outside of the community and were not included in the 2005 emissions inventory. While the Food and Agriculture strategy does not directly help the City achieve its reduction target, it does help residents protect the climate and improve the regional food system.

Background

Low Carbon Food Choices

The discussion regarding low carbon diets is often framed in terms of local versus non-local food sources. While the transportation of non-local foods does contribute to higher GHG emissions, it is not the most important factor when addressing our food carbon footprints. The amount and types of foods we eat has a more significant effect on the GHG emissions associated with our diets. Small lifestyle adjustments such as eating according to the seasons, choosing foods that are lower on the food chain, and choosing foods that are minimally processed can make a big difference.

Eating according to the seasons reduces the amount of food-related transportation emissions. Transporting out-of-season perishable foods, such as blueberries and tomatoes, can generate more GHGs than seasonal locally sourced foods. Air transportation is the highest-emission method of transporting food. Growing hothouse tomatoes and other produce in the winter is also extremely emissions-intensive because of the energy required to support plant development.



Eating from lower on the food chain is more efficient, in terms of energy input required per calories produced, compared to foods higher on the chain. Fruits, vegetables, and grains grown in North America are low carbon options for Albany residents. Poultry is relatively low in carbon compared to beef, which produces large quantities of methane during its lifespan and requires high energy inputs to grow its feed. Similarly, dairy products are also high in carbon because cows, sheep, and goats all naturally emit methane. To reduce food-related GHG emissions, meat eaters can eat smaller portions of meat, vegetarians can eat fewer dairy products, and everyone can limit the amount of food that they send to landfills.

Eating minimally processed or unprocessed foods also limits the energy input per meal. Processing and packaging foods is energy-intensive, and most processed foods contain ingredients that are highly processed themselves, such as high fructose corn syrup, sugar, or salt. Other processed foods require additional energy inputs during transportation, such as is the case with the refrigeration required to transport orange juice.

Community Food Production

The City recognizes the importance of community food security and providing residents with the ability to grow or purchase fresh produce. Urban agriculture is increasingly popular in communities throughout the nation. Home gardens, community gardens, urban orchards and farms, and edible landscaping offer city dwellers opportunities to participate in local food production. Farmer's markets provide urban consumers with locally-grown produce and a means to support the region's farmers and ranchers.

Albany currently has three community gardens located at Ocean View Park, Albany High School, and adjacent to University Village. Ocean View Park has 14 raised-bed garden plots, which are available to the public on a lottery system. The High School garden is a small facility reserved for student use. The University Village garden is a two-acre facility with numerous garden plots; however garden plots are only available to Village residents.

Strong demand exists for additional community garden space in Albany. Currently, there is no regularly scheduled farmers' market in Albany. The closest farmers' market is located at Shattuck Avenue and Rose Street in Berkeley on Thursday evenings year-round.

Food and Agriculture Objectives and Measures

Objective FA-1:

Strengthen the Regional Food System

Albany is located near the productive farmlands of the Central Valley, Solano County, and other important agricultural areas. This proximity provides residents with direct access to seasonal harvests and regionally-produced dairy products, meats, and eggs. The following measures help the City to reduce GHG emissions and support the regional agricultural economy by strengthening ties between farmers and consumers and celebrating the region's agricultural diversity.

Measure FA 1.1:	Establish a permanent farmer's market site within the City and work to expand the market as a community resource.

The City will explore potential sites for a farmer's market. Ideal sites would be centrally located and adjacent to pedestrian and bicycle infrastructure. The benefits of an open air versus covered market structure will be evaluated as part of the site analysis.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not included in inventory	$20,000	-	No

Measure FA 1.2	Facilitate and promote Community-Supported Agriculture organizations and services.

Participating in Community Supported Agriculture organizations (CSAs) allows residents to support agriculture in the regional economy and contributes to a low carbon diet by providing seasonal foods with minimal processing and packaging. The City will maintain a list of regional CSAs on its webpage with links and contact information to help interested residents to get involved.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not included in inventory	$2,700	-	No

Measure FA 1.3	Procure regionally produced food for City events and encourage vendors at City sponsored events to procure food regionally.

The City will attempt to serve food produced within 150 miles at all City-sponsored events and will encourage vendors at public events to do the same. The City will amend relevant procurement policies to ensure implementation of this measure.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not included in inventory	$2,700	-	No

Objective FA-2:

Promote Awareness of Sustainable Food Choices

The types of food we eat are an important factor when considering one's personal GHG emissions. Diets that use seasonal produce and consume less meat and dairy products and fewer processed foods have a lower carbon footprint. The City will facilitate outreach events that educate residents and create informed food purchasing decisions.

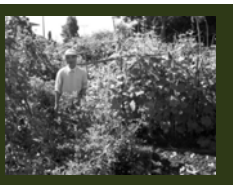
Measure FA 2.1	Encourage low-carbon meals through public education.

The City will partner with community organizations and businesses to provide outreach regarding low-carbon diets. The City will facilitate outreach events that focus on low-carbon strategies such as eating seasonal and minimally processed foods.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not included in inventory	$2,700	-	No

Objective FA-3:

Increase and Enhance Urban Agriculture



Many Albany residents support urban agriculture as a means of both food production and recreation. To provide adequate opportunities, the City needs to expand current urban agricultural facilities. The following measures describe steps to create additional community gardens and orchards in Albany, and opportunities to establish a community orchard.

Measure FA 3.1	Establish a local community garden program to increase local food security and provide local recreation amenities.

During the preparation of the Green Albany Plan, the City will identify potential sites for additional community gardens and community orchards within Albany. Site evaluation will focus on lands owned by the City, School District, and State and federal agencies and institutions. The City will work with willing agencies, community groups, and individuals to develop and maintain community gardens.

The Ohlone Greenway is a prime location to establish a community orchard. The City will work with BART to establish compatible fruit trees along the Greenway and will create outreach programs and events to facilitate the public use of this resource. The Green Albany Plan will evaluate other locations for potential community orchards.

GHG Reduction Potential (MT CO_2e)	Cost to City	Cost Per Metric Ton	Private Cost
Not included in inventory	$1,400	-	No

Community Challenge

The State's *Climate Change Scoping Plan* recommends that local governments reduce their community-wide GHG emissions to 15% below current levels by 2020. In 2007, Albany adopted a resolution to reduce GHG emissions by 25% below 2004 levels by 2020. To achieve this target the community would have to reduce its emissions by 19,600 MT CO_2e. The measures described above are likely to achieve approximately 15,660 MT CO_2e of reductions or a reduction of 19% below 2005 levels by 2020. While the strategies achieve the State's recommended target they do not fully achieve the City's more aggressive target. A gap of 3,940 MT CO_2e remains and will need to be addressed if Albany is going to achieve its climate protection objectives. The Community Challenge is a call to action that seeks to inspire Albany residents, businesses, employees, and City staff.

Community Participation

Specific participation levels were used to calculate the GHG reduction capacity of the CAP measures. High levels of voluntary particiption will be key to achieving the City's 2020 target. If additional households and businesses voluntarily participate, then the community's reductions could be larger than estimated in the CAP.

While increased participation in all measures is needed, certain actions will have larger influence than others. Increasing the number of homes and businesses that conduct building energy efficiency improvements and or install renewable energy systems could alone close the remaining reduction gap. Similarly, increasing resident and employee participation in Transportation Demand Management (TDM) programs could reduce a considerable amount of transportation-related emissions.

As an example of how higher participation could affect GHG reductions, Table III-10 describes the reduction potential of residential renewable energy,and residential and non-residential implementation using both assumed participation rates and increased levels of participation. If community participation could be increased to these higher levels, the remaining gap could be eliminated. Many other opportunities to increase community participation also exist within the CAP.

Table III-10.
Effect of Increased
Participation on GHG Emissions Reductions

Action Type:	Assumed Participation Rate	GHG Reduction Potential (MT CO_2e/year)	Increased Participation Rate	GHG Reduction Potential (MT CO_2e/year)
Residential Renewable Energy (as contained in Measure BE-2.1)	20%	2,730	45%	6,150
Residential Energy Efficiency Retrofit (as contained in Measure BE-2.1 and 2.3)	47% BE-2.1 & 2.3 Combined	1,150	70% BE-2.1 & 2.3 Combined	1,700
Non-Residential Energy Efficiency Retrofit (as contained in Measure BE-2.1 and 2.3)	21% BE-3.1 & 3.2 Combined	360	70% BE-2.1 & 2.3 Combined	880
Total:	-	**4,240**	-	**8,730**

In order to mobilize higher levels of participation in all GHG reduction activities, the City and community organizations will need to conduct unprecedented levels of public outreach. These outreach programs must inspire individuals to become involved. In addition to outreach, financial assistance programs must grow to meet the increased interest in programs such as building retrofit and renewable energy installation.

Individual Actions

Ultimately, the community's GHG emissions are the sum of individual actions and choices. By changing our behavior and consumption patterns, individuals, households, and businesses have the ability to reduce their GHG emissions. Combined, these individual actions do add up. Many individual actions are beyond the scope of municipal policies and will be carried out on a voluntary basis. While this is true, the City will assist individual actions through outreach programs and technical assistance.

The City will maintain a climate action portal on the City's website and will provide a household carbon calculator, a list of recommended actions and resources, and links to community and national climate action groups. The list of recommended actions will be frequently updated and provide useful, easy-to-implement GHG reduction tips.

A list of potential individual actions that residents could implement includes the following:

- **Home Energy and Water Conservation:**
  - Buy energy-efficient appliances with the "Energy Star" label
  - Reduce the thermostat in cool weather by three degrees
  - Weather-proof your building
  - Unplug electronics when not in use and use energy reducing surge protectors
  - Install motion sensors on outdoor lights and in infrequently used rooms
  - Turn off lights and other devices when not needed
  - Replace older light bulbs with energy-saving fluorescent or LED bulbs

- Maintain your refrigerator and freezer at the right temperature
- Replace all fixtures and fixture fittings with the most water efficient option
- Take shorter showers or use less bath water
- Don't leave the tap running when not brushing teeth, shaving, or doing dishes
- Turn down the water heater temperature
- Use appliances efficiently – only run the dishwasher or clothes washer when it is full
- Dry your clothes on a clothes line
- Convert your lawn into a garden or native plant landscape
- Use drought resistant plant species

- **Shopping:**
  - Buy fewer items
  - Buy second-hand items if possible
  - Buy durable goods
  - Buy only post-consumer recycled paper products
  - Buy FSC certified wood to support sustainably managed forests
- **Transportation:**
  - Bike to work or shopping
  - Use public transit or carpools for long trips
  - Walk short distances rather than drive
  - Drive more efficiently
  - Consolidate trips
  - Purchase an efficient model next time you need to buy a car
  - Consider doing without your car
- **Diet:**
  - Eat low on the food chain (reduce meat and dairy in your diet)
  - Eat local seasonal produce
  - Eat minimally processed foods

Additional Emission Reductions from Statewide Legislation

To implement AB 32, the State of California has established companion legislation that will reduce GHG emissions statewide, across all sectors. SB 107 and AB 1493, described within Chapter III, establish performance standards for GHG emission reductions from electric utilities and motor vehicles, respectively. As the regulatory framework surrounding AB 32 grows, other future legislation will help further reduce GHG emissions statewide. At the time of CAP preparation, the City only has confidence in estimating the GHG emission reductions associated with SB 107 and AB 1493. In the future when additional legislation is further defined it will possible evaluate a wider range of statewide reductions. Please also refer to Chapter I for further discussion of State Climate Change regulations.

Senate Bill 107

SB 1078 and SB 107 have established increasingly stringent renewable energy requirements for California utilities. SB 1078 required investor-owned utilities to provide at least 20% of their electricity from renewable resources by 2020. SB 107 accelerated the timeframe to take effect in 2010. Renewable energy could include

wind, solar, geothermal, or any "Renewable Portfolio Standard (RPS)-eligible" sources. It is anticipated that PG&E, Albany's electricity provider, would meet the 20% RPS requirement by 2010, as required by law, and this performance criteria would also be in effect at the CAP target year (2020). Therefore, in the year 2020, a minimum of 20% of the electricity consumed by the City's residential, commercial, and industrial uses would be produced by renewable resources and would not generate additional GHG emissions. Executive Order S-14-08 would increase the RPS further to 33% by 2020, but this order has yet to be codified at the time of preparation of this report. Thus, only the 20% RPS can be considered foreseeable at the time of writing.

The 2005 PG&E-specific electricity emission factor used to calculate GHG emissions associated with the City's electricity consumption accounted for the percentage of renewable resources used by PG&E for electricity production in 2005. PG&E's current (2008) electricity production portfolio is comprised of approximately 14% renewable resources (PG&E 2008). Although it is likely that the percentage of renewable resources in 2005 was less than in 2008, the difference between the 2008 and 2020 renewable resource portfolio was used to conservatively calculate the emission reduction attributable to SB 107.Therefore, an additional 6% of the City's 2020 GHG emissions associated with electricity consumption would be reduced between current conditions and 2020 associated with the implementation of SB 107. See Table III-10 below for the estimated emissions reduction effect of SB 107 on Albany's 2020 GHG emissions.

Assembly Bill 1493

AB 1493 will result in GHG emission reductions from on-road passenger motor vehicles sold in California. The emission reduction potential associated with implementation of AB 1493 vehicle emission standards would vary depending on the first regulated model year and vehicle turnover between the present fleet and the fleet in 2020.

Emission factors used (EMFAC 2007 and CCAR's *General Reporting Protocol* Version 3.1) to estimate 2020 and 2050 transportation-related GHG emissions do not account for mobile-source GHG emissions reductions that could be achieved through implementation of AB 1493 or equivalent regulations because the law has not been fully implemented at the time of writing.

To provide an estimate of the reasonably foreseeable GHG emission reduction potential of motor vehicle emission regulations, the GHG emissions reduction associated with AB 1493 was estimated using information presented in the AB 32 Scoping Plan. The *Climate Change Scoping Plan* expects approximately a 19.7% reduction in on-road mobile-source GHG emissions (ARB 2008). AB 1493 allows two model years of lead time for automakers to comply with the vehicle emission standards. Therefore, the earliest model year that could reasonably be expected to comply with AB 1493 would be model year 2012. For this reason, it was assumed that AB 1493 would be 80% implemented by the year 2020 (allowing for two years of delay). Thus, the likely GHG emission reduction of AB 1493 on on-road mobile-source GHG emissions in Albany was assumed to be approximately 15.76%. See Table III-10 below for estimated GHG emission reduction potential of AB 1493 in the City of Albany.

Table III-11.
Greenhouse Gas Emission Reductions from State Legislation

Legislation	GHG Emission Reductions from Projected 2020 Emissions (MT CO_2e)
SB 107	968
AB 1493	3,629
See Appendix A for detailed assumptions and calculations.	

Statewide Reductions in Relation to CAP Measures

The emission reductions shown above in Table III-10 represent the upper bound of the potential emission reductions associated with SB 107 and AB 1493. Similar to the method used to quantify the City's CAP measures, the statewide emission reductions estimates assume that no other emission reduction activities would occur. In reality, implementation of the City's CAP measures and the State regulations could occur, simultaneously or one preceding another. Thus, GHG reductions from emissions sectors affected by both City CAP measures and State regulations would not have a purely additive effect. Rather, emission reductions achieved by one (i.e., CAP measures or State regulations) would reduce the capacity of the other to reduce emissions. For example, if SB 107 reduces electricity consumption-related emissions by 6% then the potential for additional GHG reduction by the City's electricity conservation-related CAP measures would be reduced. Conversely, if the City's CAP measures reduce the quantity of electricity consumption-related GHG emissions, then the overall effectiveness of SB 107 is reduced.

The timing and synergistic effect of the State regulations in relation to the City's CAP measures are uncertain. Nonetheless, because the focus of the CAP is on actions the City can take to reduce community-wide GHG emissions, the emission reductions achieved by the City's actions were determined first and independent of statewide reductions. As discussed earlier in this chapter, Albany has made efforts to ensure that reductions contained within the CAP provide a unique and independent contribution to the State's GHG gas reduction efforts. The City has not taken credit for any of the reductions resulting from the implementation of the State regulations. The emission reductions associated with SB 107 and AB 1493 are likely to further reduce GHG emissions within the community.

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Chapter IV
Implementation

Climate change is one of the most critical challenges facing society today. Overcoming climate change will require substantial efforts from government, organizations, and individuals. To meet its greenhouse gas (GHG) emissions reduction target, the City needs to prioritize actions; mobilize residents, business owners and staff; and work with neighboring jurisdictions and regional agencies to create workable solutions. This chapter describes the City's approach to implementing the Climate Action Plan (CAP) and provides actions to accompany each measure presented in Chapter V.

Approach

The City recognizes climate change as a threat to the community's health, safety, and welfare. Reducing emissions and adapting to a changing climate are not simply good ideas, they are global imperatives. Given the urgency of the challenge at hand, the City places great emphasis on implementation of CAP measures.

Translating the measures into on-the-ground results requires tangible action steps, reliable funding, and the flexibility to change course as economic, political, and environmental conditions demand.

This chapter contains the following sections:

- *Implementation Matrices:* An implementation matrix is provided for each CAP measure that describes recommended actions, timeframes, performance metrics, and responsible departments and agencies.
- *Funding Strategies:* This section describes funding strategies available to implement CAP measures and actions. Potential future financing tools are also identified.
- *Plan Adaptation and Evolution:* This section discusses the need for the CAP to be updated and amended over time to ensure that it remains relevant as the science of climate change continues to emerge and climate action policy evolves over time.

Implementation Matrices

In Chapter III, matrices are provided for each quantified CAP measure that will help City staff and other responsible agencies implement CAP actions. The matrices will also enable the City Council and the public to track key actions and deadlines and monitor progress. Each matrix provides the following information:

- *Action Steps:* The specific actions that the City will take to implement the measure, the timeframe, and the responsible department(s).
- *Progress Indicators:* The benchmarks that will be used evaluate the performance and level of implementation of each measure. Both interim and final indicators are provided.

Even well-intended policies can be difficult to turn into reality. Because reducing the community's emissions is vitally important, the City has identified individual actions that support each measure. Providing specific action steps for each measure improves the odds of successful implementation by forming clear lines of responsibility and establishing schedule priorities.

Evaluating the performance of each measure is crucial for Albany to achieve its GHG reduction target. While the City employed rigorous methods to estimate the emission reduction capacity of each measure, such estimations are inherently imprecise due to the wide range of assumptions employed in such calculations. As time progresses and climate change science advances, the City should evaluate the actual performance of each measure on an annual basis. Such evaluation may be accomplished by comparing actual performance to the performance standards established within this section. Ideally, the identified actions should cause measures to meet or exceed these standards. If they do not, the City should examine ways to increase measure performance or create new measures capable of making up for missed emission reductions.

The City's Environmental Resources Division will track and report progress toward achieving the City's GHG emission reduction target of 25% below 2004 levels by 2020. The Division will provide annual reports to the City Council on the progress made toward achieving the reduction target as a whole, and for each quantified measure. The report will describe the following:

- Estimated GHG reductions for current year and to-date
- Implementation costs
- Cost savings and payback for given strategies
- Co-benefits realized
- Remaining barriers to implementation

Funding Strategies

This section describes potential funding sources and strategies that Albany could pursue to cover costs related to the CAP. Though the City will not be the sole entity paying for CAP measures, only the relative likely public costs of each measure have been identified, not those borne by individuals or businesses. The estimated costs to the City for each measure are presented in Appendix B, with an indication of whether local residents or businesses would also required to pay a direct cost for each measure.

The CAP will require strategic public funding by the City, by regional government agencies, and by the state and federal governments to provide capital projects, incentives, outreach/education, and new regulations necessary to achieve the plan's objectives. To decrease costs and to improve the plan's efficiency, actions should be pursued concurrently whenever possible. For example, the City should pursue actions related to land use and transportation together during its upcoming General Plan update.

Funding sources have not been identified for all actions. However, numerous state and regional grants are available to assist with funding some of the more expensive strategies, such as capital improvement projects related to transportation. In addition, Albany can and should partner with Alameda County and other nearby jurisdictions to administer joint programs as feasible. As many businesses in the Bay Area are leaders in renewable energy and green infrastructure, potential opportunities to partner with the private sector to decrease the costs of implementation abound. Finally, many of the measures and actions have the potential to be self-financing if properly designed and implemented.

State and Regional Grants

Of all of the strategies in the CAP, the Transportation and Land Use Strategy is the most expensive, as it requires the creation of new pedestrian and bicycle infrastructure. Fortunately, numerous regional and state grants are available to assist with transportation improvements.

Transportation Fund for Clean Air

The Transportation Fund for Clean Air (TFCA) is a Bay Area Air Quality Management District (BAAQMD) grant program funded by a surcharge on motor vehicles registered in the Bay Area. The purpose of the TFCA program is to provide grants to support Bay Area projects that will decrease motor vehicle emissions and thereby improve air quality. It funds 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 that enhance the availability of transit information.

Safe Routes to Transit

Regional Measure 2, the $1.00 bridge toll increase, funds projects that enhance pedestrian and bicycle access to transit stations. TransForm is administering the program. Funding cycles are approximately every two years.

Livable Communities & Housing Incentive Program

The Metropolitan Transportation Commission (MTC) Transportation for Livable Communities (TLC) program provides technical assistance and capital grants to help cities, neighborhoods, transit agencies, and nonprofits develop transportation-related projects that improve walking and bicycle access to public transit stations, major activity centers, and neighborhood commercial districts.

Safe Routes to Schools

Safe Routes to School is an international movement focused on increasing the number of children who walk or bicycle to school by funding projects that remove barriers that currently prevent them from doing so. Those barriers include lack of infrastructure, unsafe infrastructure, lack of 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. One is the State program referred to as SR2S. The other is the federal program referred to as SRTS. Both fund qualifying infrastructure projects.

Alameda County Transportation Improvement Authority Measure B

Measure B (2000) funds millions of dollars worth of local transportation improvements in every Alameda County jurisdiction. These are the most flexible Measure B funds and can be used for local transportation priorities. Viable uses of Measure B funds include street and road improvements; transit, bicycle, and pedestrian improvements beyond those funded with Measure B Bicycle and Pedestrian Funds; and encouraging transit use instead of cars.

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 that includes mobility, access, and safety. The maximum award is $300,000, and a local match of 20 percent of the grant request is required.

Partnerships with Private Companies

The Bay Area is home to numerous private companies who provide renewable energy or green infrastructure. The success of the CAP depends in part on collaboration between these businesses and the City and/or public. Both Better Place (located in Palo Alto) and Coulomb Technologies (located in Campbell) are developing electric plug-in auto charging station infrastructure throughout the Bay Area. Pacific Gas and Electric (PG&E) and the East Bay Municipal Utility District (EBMUD) also administer 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 these businesses, as well as new businesses as they arise, will enable the City to both save money and provide the community with the most up-to-date green infrastructure.

Power Purchasing Agreements

Solar power has become increasingly more accessible and cost-effective due to Power Purchase Agreements (PPAs). In a PPA, a private company or third party installs the solar panels at no cost to the consumer and maintains ownership of the installed panels, selling customers the power the panels produce on a per-kilowatt-hour basis at a locked-in rate. The locked-in rate is often lower than what customers pay their utility today, and the rate increases at a fixed percentage (usually 3.5% or 3.9%) annually. In addition to installing the panels, the third party monitors and maintains the systems to ensure that they keep working. The contract period for a PPA is typically 15 years, at which point the third party will cancel or sign a new agreement with the building owner.

Partnerships with Other Jurisdictions

As Albany is a relatively small city, partnering with neighboring jurisdictions is another key implementation strategy supporting the CAP. The City of Berkeley is the primary potential partner the City will pursue given both Berkeley's proximity to Albany, and its own dedication and leadership addressing GHG emissions and climate change. Berkeley has been identified in the CAP as a potential partner in creating a food industry grease-to-biodiesel recycling program, and obtaining AC Transit EasyPasses for City employees, as the City of Albany alone is too small to qualify. Albany will also seek to partner with AC Transit to improve the public transit system, and with Alameda County to improve the energy efficiency of the City street lights.

New Financing Products and Programs

There are numerous financing products and programs the City could establish to encourage homeowners and business owners to invest in energy efficiency. The potential products include on-bill financing, low interest loans, and energy efficient mortgages. There is great variability in the potential structure of the programs and products. However, all three establish a lender/borrower relationship in which the City, utility or private lender loans the building owner money to pay for upgrades and the amount loaned is paid back over time. The cost (or payback) to the City is wholly dependent on how much the City intends to subsidize interest rates.

Energy savings could also be financed through a (potentially tax-exempt) municipal bond issue or through a Local Improvement District (LID). In the case of the bond, the City would administer a revolving loan fund with the bond proceeds. The goal is to provide capital for energy efficiency upgrades at the lowest cost of capital possible. With a LID, the City will pay the upfront costs and property owners will repay those costs over time through a special assessment on their property tax bills.

Self-Financing Strategies

CAP measures include incentives, as well as regulations or fees to change the community's behavior. It is important that the fees established in the CAP be self-financing. For example, the amount of the tiered residential parking fee that increases with vehicle size should be large enough to pay for both program creation and on-going implementation.

Utility Taxes

Electricity Tax

The City could implement a Climate Action Plan Tax levied on electricity usage (per kilowatt hour) for City of Albany residents and businesses. The charge would be included on customers' PG&E bills and collected during the normal billing process, with different rates for residential, commercial, and industrial users. Customers enrolled in PG&E's ClimateSmart program may be eligible for exemption or partial exemption from the tax.

Trash Tax

The City could establish a tax on the amount of waste generated by residents and businesses. The Trash Tax would be levied on trash haulers in Albany, based on the amount of trash they collect within City limits. The trash haulers could pass the tax onto their customers as a line-item expense in their bills. Trash Tax revenue could be used to fund waste reduction programs.

Plan Adaptation and Evolution

The 2009 CAP represents the City's best attempt to create an organized, community-wide response to the threat of climate change at the time of preparation. The field of climate action planning is rapidly evolving. Over the next decade, new information about climate change science and risk is likely to emerge, new GHG reduction technologies and innovative municipal strategies will be developed, and State and federal legislation are likely to advance. In order to remain relevant and to be as effective as possible the CAP must evolve over time.

In combination with the annual monitoring and reporting requirements for individual measures and actions outlined in the matrices above, the CAP as a whole will be reviewed and modified every three years to identify potential plan update needs. These reviews will evaluate improvements to climate science, explore new opportunities for GHG reduction and climate adaptation, and respond to changes in climate policy. As many of Albany's CAP measures will be implemented through the City's upcoming General Plan update, the first CAP review should occur following adoption of the General Plan. Furthermore, the CAP should be identified as an implementation program supporting achievement of land use, circulation, and conservation policies within the General Plan.

Relationship to the California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires the City to identify the significant environmental impacts of its discretionary actions and to avoid or mitigate those impacts, if feasible. Senate Bill 97 (2007) acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. When the City undertakes a discretionary action, such as approval of a proposed development project, plan, policy, or code change, the City will evaluate whether that action would result in a significant climate change impact. Adoption of the CAP itself by the City is considered a project under CEQA. The overall purpose of the CAP is to reduce the impact that the community will have on global climate change and, therefore, reduce an

impact on the environment. However, as with any proposal involving construction, implementation of the CAP could potentially result in adverse impacts on the physical environment, such as degrading visual resources, biological resources, or cultural resources. An Initial Study is being prepared by the City pursuant to CEQA to evaluate the potential impacts of implementing the CAP. Because the CAP will have undergone environmental review under CEQA, and is intended to reduce the City's impact on climate change, determining the consistency of a proposed project with the CAP is one way to evaluate whether a project would have a significant climate change impact. Projects will be expected to quantify and disclose GHG emissions during planning review. Projects shall also be in compliance with CAP requirements and State CEQA Guidelines.

When determining whether a proposed project is consistent with the CAP, staff should consider the following:

- The extent to which the project supports or includes applicable strategies and measures, or advances the actions identified in the CAP;
- The consistency of the project with Association of Bay Area Governments (ABAG) population growth projections, which are the basis of the GHG emissions inventory's projections;
- The extent to which the project would interfere with implementation of CAP strategies, measures, or actions.

If the City determines in its environmental review that the proposed project would conflict with the CAP, the City would be required to incorporate mitigation measures, where feasible, within the proposed project to minimize its greenhouse gas emissions and/or climate change impact. If mitigation measures are determined infeasible, the City has the option to adopt a statement of overriding considerations as described in Section 15093 of the State CEQA Guidelines.

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Chapter V
Public Participation

Albany residents actively participated in the formulation of this Climate Action Plan (CAP) and were vital to its success. The objective for the community participation was to provide initial direction for the Plan, to provide comments on the draft, and to highlight local issues and opportunities that could enhance local community sustainability while also reducing greenhouse gases (GHGs). Community investment and support in the outcome of the CAP is critical to its success, and community members will continue to take an active role to both implement the Plan and monitor its effectiveness over time.

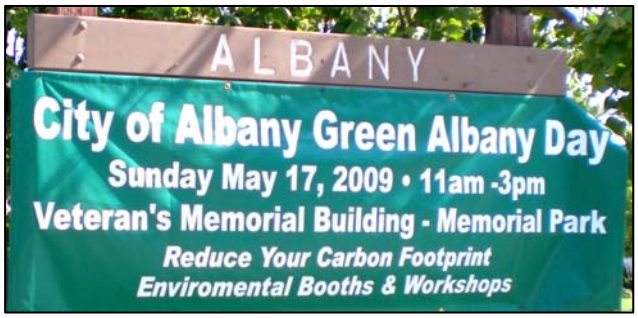
Outreach Methods

A variety of outreach tools allowed all who wished to participate to do so in a manner with which they felt comfortable. Outreach efforts included meetings with Albany's Sustainability Committee, an information-packed PowerPoint presentation available to organizations and individuals throughout the City, a web-based community survey, and workshops at Green Albany Day 2009. A brief summary of each activity follows. Copies of various outreach materials are also provided in Appendix C.

Sustainability Committee

Leading the effort to prepare the CAP was the Sustainability Committee, which was established to advise the City Council on policies, programs, and issues promoting environmental sustainability.

The Sustainability Committee provides leadership, technical assistance, education and outreach to members of the public, schools, local businesses, and city agencies on innovative programs to promote environmental sustainability through energy conservation, solid waste reduction and recycling, water conservation, pollution prevention, transportation efficiency, and other means. The Committee is composed of seven members, one each appointed by City Council members, one at-large appointment, and one youth member appointed by the Albany Unified School District Board.



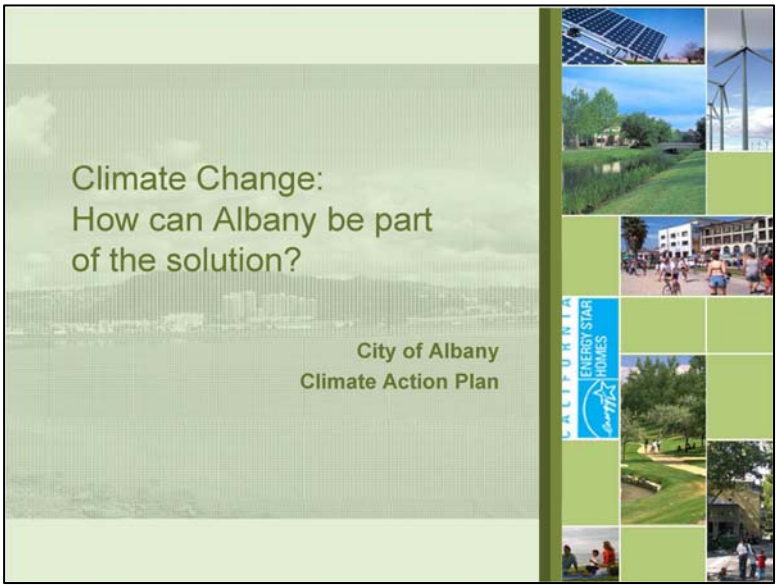
The Sustainability Committee was the principal body for identifying, confirming, and validating community concerns and desires, and functioned as a conduit between the City, residents, property owners, and the business community in the formulation and review of CAP strategies and measures. The group analyzed a full spectrum of community issues, opportunities, and challenges. Prior to release of the Administrative Draft CAP, the Sustainability Committee met four times to review and discuss: 1) the objectives of the CAP work program; 2) preliminary results of the community survey; 3) the GHG inventory, projections, and reduction targets; and 4) draft GHG reduction strategies and measures. Following release of the Administrative Draft CAP, the Sustainability Committee met twice to review the draft Plan. The committee provided valuable feedback that was incorporated into the Public Draft CAP. All Sustainability Committee meetings were advertised and open to the public. Many community members and organizations attended to offer meaningful input which was used to craft CAP strategies and measures. Copies of Sustainability Committee meeting minutes where the CAP was discussed are included as Appendix D.

Community PowerPoint Presentation

The City and consultants prepared a PowerPoint presentation that was used by City staff and Sustainability Committee members to describe the preparation of the CAP to groups and organizations throughout the community. The presentation defined the challenges and opportunities of climate action; described why taking action now matters both locally and globally; presented California's legislative framework for climate change planning; defined the proposed process for completing Albany's CAP; and reviewed best practices used in other jurisdictions to reduce GHGs associated with land use, transportation, green building, energy efficiency, renewable energy, water conservation, recycling and waste, and public outreach. The presentation concluded by presenting actions individuals could take now to reduce their carbon footprint, and presenting information regarding how people could participate in formulating the CAP. A copy of the PowerPoint presentation is provided as Appendix C.

Climate Action Survey

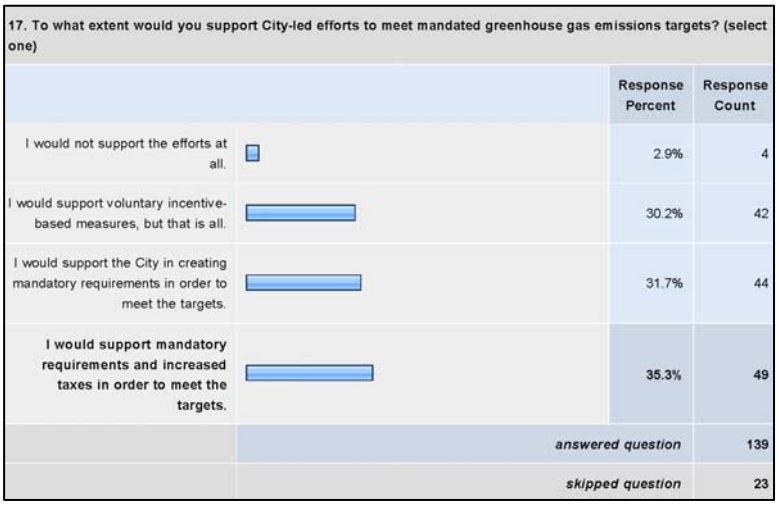
The City sponsored the first of two online climate action surveys between October 2008 and June 2009 to provide input for the CAP. City staff also sponsored info tables at the Senior Center and Community Center and a booth at the City's 4th of July celebration to distribute paper copies of the survey. Over 160 responses to the survey were received. The survey consisted of 21 questions regarding transportation choices, home and business energy use, community shopping and services, renewable energy, water conservation, waste reduction, and sea level rise. The survey also asked residents to identify the level of support they would offer



the City with regard to implementing mandatory requirements versus incentive-based programs to achieve GHG reductions and concluded with a series of demographic questions regarding each respondent's age, whether they own or rent property within the City, and their annual income. A second online survey was released with the public review draft of the CAP to assess public support for specific measures included in the plan.

Key Findings

Although the number of responses received does not achieve statistical significance, responses to the survey still provide valuable insights into community opinion. Copies of the survey questionnaire and June 2009 results are provided as attachments to this chapter.
Following are some of the key survey findings.



17. To what extent would you support City-led efforts to meet mandated greenhouse gas emissions targets? (select one)		Response Percent	Response Count
I would not support the efforts at all.		2.9%	4
I would support voluntary incentive-based measures, but that is all.		30.2%	42
I would support the City in creating mandatory requirements in order to meet the targets.		31.7%	44
I would support mandatory requirements and increased taxes in order to meet the targets.		35.3%	49
	answered question		139
	skipped question		23

Demographics

Few survey respondents were under 18 years of age or over 65 years of age. This suggests a need for additional outreach within these communities as the CAP is implemented. Both groups can play important roles in implementing the CAP through a youth/senior Green Corps programs.

Need for Climate Action

General consensus among the responses indicates that City policies should address climate change. Two-thirds of all respondents indicated support for City efforts to create mandatory requirements versus incentive-based approaches. More than half of those respondents also indicated a willingness to pay higher taxes to support these efforts.

Transportation

The private car was the predominant travel mode for most respondents, but other travel modes were also used (i.e., bike, walk, public transit). Working from home was a low-carbon option for about 20% of respondents.

Public transit played only a minor role in respondents' transportation choices. More than 80% of respondents claimed to ride public transit "monthly", "only a few times a year", or "never." Respondents generally found transit use inconvenient compared to private automobile use, citing that driving is faster, safer, and more accessible to a variety of locations. Shuttles to/from residential neighborhoods and job sites, car share programs, additional stops with more amenities, and additional shopping and employment centers near Bay Area Rapid Transit (BART) stops were all suggested as potential options to improve the appeal of public transit.

Roughly half of the respondents walked or biked to purchase daily goods and services. More respondents indicated they would walk/bike if the City helped to improve route (i.e., sidewalks, bike paths) quality and safety, and decrease distance to and increase the diversity of destination shops and service centers.

Building Energy

Respondents acknowledged the benefits of energy efficiency measures for GHG reductions, cost-savings, and quality of life improvements. Respondents provided strong support for new regulations that would require increased energy efficiency in new construction and major remodels, market-based incentives, and voluntary measures that produce co-benefits.

More than 60% of respondents indicated that the City should require that buildings be retrofitted to a higher level of energy efficiency at the time of resale, or major additions and remodels. More than 80% of respondents said that the City should provide loc interest loans to property owners who want to retrofit their homes or businesses to be more energy-efficient. However, numerous respondents pointed out that current economic conditions should be taken into account, and that such programs should not tack on major expenses for those trying to buy, sell, or remodel a home.

With regard to their own potential home energy efficiency improvements, respondents favored low-cost measures (e.g., changing out traditional light bulbs with compact fluorescents). More expensive and slow-payback measures (e.g., insulation, solar hot water heaters, or solar panels) had lower levels of support. If these are important for achieving GHG reduction targets, then the City needs to work to: a) remove financial barriers, and b) provide public education to inform residents about potential financial benefits.

Water Conservation and Waste Reduction

Respondents offered very strong support for water conservation and waste reduction measures, even for mandatory regulations and behavior changing measures. Strong support was offered for credits on water bills if a household uses less than an established number of gallons per month; requirements for new construction and major remodels/additions should to use the lowest water consuming appliances available; and City goals to become a zero waste community.

Renewable Energy

More than 90% of respondents offered support for installing photovoltaic panels or wind turbines on municipal buildings/properties, so long as it is cost-effective. Respondents expressed some interest in photovoltaic panels or solar hot water heaters for homes or commercial buildings. Approximately 75% supported spending extra on monthly utility bills to offset GHG emissions associated with home energy use. Respondents also supported wind energy generation, provided that concerns about impacts to birds, bats, and aesthetics can be resolved.

Sea Level Rise

More than 80% of respondents supported adapting land uses in low-lying areas of the City to rising sea levels versus building levees.

Community Workshops

The City also conducted two community workshops in conjunction with Green Albany Day on May 17, 2009. The workshop focused on proposed GHG reduction strategies and measures to be contained in the Draft CAP. The workshop objective was to receive public comment and establish preliminary levels of support for each key strategy and measure. The workshop consisted of a PowerPoint presentation and several stations outlining proposed Climate Action Plan measures.

Discussions at Green Albany Day focused on exploring potential for creating an urban farm on the Gill Tract, concerns that the proposed bicycle infrastructure within the complete streets CAP measure was too expensive relative to the improvements called for in the Bicycle Master Plan, desires for San Pablo Avenue and Solano Avenue to be more pedestrian-friendly, concern regarding potential costs of a Residential Energy Conservation Ordinance to homeowners and its potential effect on low or moderate income households, and desires to facilitate high-density residential and mixed-use development in a way that is compatible with surrounding neighborhoods. Copies of the workshop posterboards and PowerPoint presentation are provided as an attachment to this chapter.

Attachments

The following materials are provided in Appendix D to document the public outreach process for the CAP. All materials associated with the outreach program are available for review at the Albany Environmental Resources Department.

- Sustainability Committee meeting minutes for September 17, 2008
- Sustainability Committee meeting minutes for December 17, 2008
- Sustainability Committee meeting minutes for March 18, 2009
- Sustainability Committee meeting minutes for April 15, 2009
- Sustainability Committee meeting minutes for June 15, 2009
- Community PowerPoint presentation, “Climate Change: How can Albany be part of the solution?”
- Climate action survey questionnaire
- Climate action survey results – June 11, 2009

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Appendix A.

Emissions Inventory, Baseline, and Projections Methodologies

Appendix A: Emissions Inventory, Baseline, and Projections Methodologies

This appendix summarizes the methodologies and assumptions used contained within the greenhouse gas (GHG) emission inventory, baseline, and projections.

Emissions Inventory

This section describes methods used by ICLEI – Local Governments for Sustainability (ICLEI) to develop Albany's GHG emissions inventory. The methodology for each emission sector (i.e., energy, transportation, waste) is discussed below.

Methodology

ICLEI's Clean Air Climate Protection (CACP) Software is an emissions inventory computer program that uses activity data (e.g., energy consumption, vehicle miles traveled [VMT]) to calculate GHG emissions associated with each emission sector. ICLEI used California-, Alameda County-, and/or Albany-specific activity data and emissions factors when possible, which generated a more accurate estimation of GHG emissions for the City. The methods and assumptions used for each sector are summarized as follows.

Energy Consumption

The emissions inventory used natural gas and electricity consumption data for residential, commercial, and industrial land uses for the year 2004 from Pacific Gas and Electric (PG&E). The energy consumption data separated private from City-operated facilities. Due to PG&E's 15/15 Rule, discussed below in the GHG Emissions Baseline section, energy consumption data for commercial and industrial land uses were combined together for both natural gas and electricity.

To calculate GHG emissions from natural gas and electricity consumption, ICLEI obtained California-specific emission coefficients from PG&E. For natural gas consumption, a 2005 PG&E-specific emission factor (kilograms of CO_2 per million British thermal units [kg CO_2/MMBtu]) for natural gas delivery was used within CACP for both community-wide and government-related natural gas consumption. A 2005 natural gas delivery coefficient was used because no verified 2004 coefficients were available. The PG&E-specific natural gas coefficient was verified by California Climate Action Registry (CCAR) and the California Energy Commission (CEC). Similar to natural gas consumption, a 2005 PG&E-specific emission coefficient (pound of CO_2 per kilowatt [lb CO_2/kWh]) was used for electricity delivery, which is also verified by CCAR. The 2005 electricity coefficient was used because no verified coefficients were available for operational year 2004. The PG&E-specific electricity emission coefficient accounts for the cleaner (i.e., less carbon intensive) electricity portfolio used by PG&E relative to the nation-wide average.

Transportation

Metropolitan Transportation Commission (MTC) and the California Department of Transportation (Caltrans) provided VMT data for local roadways within the City limits. Public transit activity data (i.e., Bay Area Rapid Transit [BART] and Alameda and Contra Costa [AC] Transit) were embedded within the community-wide data.

Caltrans also provided VMT data for state highways located within the City limits. Lastly, the City provided detailed vehicle and VMT data for the government (i.e., City) vehicle fleet.

ICLEI used the California Air Resources Board's (ARB) Emission Factors model (EMFAC2007) to obtain Alameda County-specific emission coefficients for vehicle fuel distribution, vehicle fuel efficiencies, and emission factors. Alameda County-specific EMFAC2007 data were only used for community-wide transportation data. The City provided municipal vehicle fleet data with specific information regarding fuel and vehicle types. ICLEI also used EMFAC2007 to generate emission factors for the City vehicle fleet.

Solid Waste

The California Integrated Waste Management Board (CIWMB) provided solid waste disposal data. Alameda County-specific waste categorization percentages were obtained from the *Alameda County Waste Characterization Study 2000*. Due to the differences in the *Alameda County Waste Characterization Study*'s waste categories and the categories contained within CACP, the *Waste Characterization Study* categories were combined to better match CACP categories. For example, waste categories from the *Alameda County Waste Characterization Study* such as plastic, glass, metals, and other waste were combined together to account for an "all other waste" category within CACP. For Government-related waste categories, standard state waste percentages from CIWMB were used.

CACP provides GHG emission factors for various solid waste categories. These factors, which are based on national emission data, were used to calculate GHG emissions associated with solid waste disposal. The only alteration of the factors was to remove credit for carbon captured in landfilled solid waste, because the method does not include responsibility for carbon emissions from production and consumption of materials that later become solid waste.

Emissions Baseline

To refine the 2004 emissions inventory to establish an effective baseline for the Climate Action Plan (CAP), the City requested that EDAW conduct a peer review of the inventory. This effort resulted in modifications to the 2004 GHG emissions inventory to remove GHG emissions associated with travel on state highways and add GHG emissions associated with water consumption. Table A-1 identifies the City's GHG emissions baseline for the year 2004 for purposes of the CAP. Albany's reduction target of 25% below baseline emissions by 2020 applies to these baseline emissions, which include the government-related emissions presented in Table A-1.

Methodology

Transportation

Albany's community-wide transportation sector includes emissions generated from VMT on local streets and state highways. State highway traffic is responsible for 79% of the GHG inventory's total transportation emissions. The City has no control over the vehicles passing through Albany on state highways and their associated GHG emissions. Thus, the 2004 GHG emissions baseline does not include these emissions. The community-wide transportation sector contains only VMT on local roadways, which can be directly influenced by City policy and action.

Table A-1.
Albany Baseline GHG Emissions and Percent Contributions

Community Sector	Final Inventory Emissions	
	Metric Tons CO_2e	Percent
Residential Energy Use	20,495	29%
Commercial/ Industrial Energy Use	20,788	30%
Transportation [1]		
Local travel	23,703	34%
Waste	3,652	5%
Water Consumption	1,190	2%
Total	**69,830**	**100%**

Source: Data compiled by EDAW 2008 from ICLEI's CACP inventories.

Notes: Totals may not appear to add exactly due to rounding.

[1] Transportation emissions occurring in the City's limits also include state highway VMT, which accounts for 89,049 metric tons CO_2e per year. These emissions are not included in the calculation of the City's baseline emissions due to the inability of City policies to control or affect state highway VMT patterns.

Water Consumption

Energy use associated with water consumption accounts for approximately 20% of California's total energy use (CEC 2006). However, the 2004 GHG inventory did not include emissions associated with water consumption. In order to more accurately portray existing conditions, water-related GHG emissions in Albany were added to the 2004 baseline. The East Bay Municipal Utility District (EBMUD) provided historical water consumption data (1976-2008) for Albany. The 2004 water consumption data were used to calculate the City's GHG emissions associated with water consumption.

CEC has estimated the level of electricity use associated with water supply and conveyance, water pre-treatment, water distribution, and wastewater treatment in both Northern and Southern California (CEC 2006). Assumptions used to estimate water-related electricity consumption for Albany are specific to Northern California. CCAR's *General Reporting Protocol* Version 3.1 GHG emission factors for electricity use were then used to calculate $MTCO_2e$ associated with water-related electricity use. As discussed above, residential and commercial/industrial GHG emissions associated with energy consumption were calculated using PG&E-specific assumptions. However, due to range of utility providers potentially engaged in the water delivery process, California statewide-average GHG emission assumptions were used to project emissions associated with water-related energy consumption in Albany.

Energy Consumption

As mentioned above, PG&E provided energy use (i.e., natural gas and electricity) data for both community-wide and government-related operations. Based on PG&E's 15/15 Rule, any aggregated information provided by the utilities must be made up of at least 15 customers and a single customer's load must be less than 15% of an assigned category. If the number of customers is below 15, or if a single customer's load is more than 15%, PG&E must combine certain data categories (e.g., commercial and industrial energy consumption) prior to

release to protect the privacy of individual users. The 15/15 Rule was triggered for both electricity and natural gas consumption data provided to the City. Thus, PG&E aggregated both commercial and industrial energy consumption as a single sector.

The lack of detailed information resulting from the 15/15 Rule limits the ability of planners and decision-makers to target major energy use sector contributors. Various methods were employed to attempt to separate the commercial and industrial energy consumption data, including using CEC average energy consumption rates with existing land use quantities, extracting information from the Bay Area Air Quality Management District's (BAAQMD) GHG inventory, and examining criteria air pollutant emission inventories. None of these methods provided sufficient information to accurately separate commercial and industrial energy use data. Therefore, the energy use portion of the GHG inventory with aggregated commercial and industrial energy consumption is used as the basis for baseline conditions.

Projections

To determine the GHG emission reductions necessary to achieve Albany's target (i.e., a 25% reduction in emissions relative to 2004 emission levels by 2020), the City's GHG emissions were projected for the years 2020 and 2050 under a trend scenario. The trend scenario assumes that historical data and trends would be representative of future year consumption rates for energy, water, and waste. It should be noted that the purpose of this CAP is to address the City's 2020 target. The City recognizes the 2050 goal (i.e., 80% below 1990 levels) established by Executive Order S-03-05. However, due to the uncertainty of projecting 2050 activity and emission levels, this CAP focuses on the 2020 goal. As 2020 approaches, the City will reevaluate its GHG reduction target to better represent progress towards the 2050 goal.

Assuming that the same type of current emissions-generating practices continue to occur within Albany, the City's GHG emissions would be anticipated to increase from 69,830 $MTCO_2e$ in 2004 to about 71,995 $MTCO_2e$ in 2020, and about 85,106 $MTCO_2e$ in 2050. This represents a 3% and 22% increase over the 2004 baseline level in 2020 and 2050, respectively. In comparison, the City's projected population is expected to increase 4% by 2020 and 16% by 2050 from 2004 (ABAG 2002). Therefore, if current practices continue, Albany's GHG emissions are expected to increase at a higher rate than its population by 2050. This trend can be explained by increases in per capita activity levels (i.e., energy consumption, waste disposal, water consumption, and vehicle miles traveled).

A description of the methods and sources of information used to project the City's 2020 and 2050 GHG emissions for each end-use sector (e.g., energy, transportation, waste, water) is provided below. All GHG emissions have been calculated in $MTCO_2e$, which accounts for the global warming potential of nitrous oxide and methane. A summary of Albany's GHG emissions for the baseline year (2004), 2020, and 2050 is shown below in Table A-2.

Methodology

Energy Consumption

As shown above in Table A-2, GHG emissions associated with residential energy consumption in Albany are projected to increase by 3,070 $MTCO_2e$ in 2020 and 8,050 $MTCO_2e$ in 2050, a 15% and 39% net increase from baseline (2004) levels, respectively. GHG emissions associated with commercial/industrial energy consumption in Albany are projected to increase by 822 $MTCO_2e$ in 2020 and 4,825 $MTCO_2e$ in 2050; a 4% and 23% net increase from baseline levels.

Table A-2.
Albany GHG Baseline (2004) and Projected 2020 and 2050 Emissions

Emissions Sector	2004 Baseline $MTCO_2e$ (Percent of Total Emissions)	2020 Projected $MTCO_2e$ (Percent of Total Emissions)	2050 Projected $MTCO_2e$ (Percent of Total Emissions)
Residential – Natural Gas	14,567 (20.9%)	17,079 (23.7%)	20,794 (24.4%)
Residential – Electricity	5,929 (8.5%)	6,487 (9.0%)	7,752 (9.1%)
Subtotal Residential	*20,496 (29.4%)*	*23,566 (32.7%)*	*28,546 (33.5%)*
Commercial – Natural Gas	8,139 (11.7%)	8,299 (11.5%)	8,883 (10.4%)
Industrial – Natural Gas	4,009 (5.7%)	3,660 (5.1%)	4,261 (5.0%)
Commercial/Industrial – Electricity	8,641 (12.4%)	9,651 (13.4%)	12,470 (14.7%)
Subtotal Commercial/Industrial	*20,789 (29.8%)*	*21,610 (30.0%)*	*25,614 (30.1%)*
Transportation	23,703 (33.9%)	23,028 (32.0%)	29,975 (35.2%)
Waste	3,652 (5.2%)	2,813 (3.9%)	–[1]
Water Consumption	1,190 (1.7%)	977 (1.4%)	971 (1.1%)
Total	**69,830**	**71,995**	**85,106**

Sources: ICLEI 2008; EDAW 2009.

Notes: Totals may not appear to add exactly due to rounding.

[1] The 2050 solid waste sector has been omitted due to uncertainty inherent in future-year data.

In order to estimate GHG emissions associated with energy consumption in Albany in 2020 and 2050, an annual average growth rate was applied to baseline (2004) electricity and natural gas consumption rates. The U.S. Department of Energy (DOE) Energy Information Administration (EIA) publishes an annual Energy Outlook Report that forecasts electricity and natural gas consumption by land use type (i.e., residential, commercial, and industrial) for regions throughout the U.S. For Albany's 2020 and 2050 energy projections, the Pacific region forecasts from the 2009 Annual Energy Outlook were used to calculate the annual average growth rate in electricity and natural gas consumption for residential, commercial, and industrial land uses (EIA 2009). The Pacific region includes California, Oregon, Washington, Alaska, and Hawaii. Although this data includes a large geographical area, EIA data represents an accurate source of data for forecasted energy consumption in Albany.

As a result of PG&E's 15/15 Rule, the baseline inventory included aggregated commercial and industrial electricity consumption. Therefore, commercial and industrial electricity consumption was projected using the average of the commercial and industrial annual average growth rates from EIA. The 15/15 Rule also affected the commercial and industrial natural gas consumption rates. However, natural gas consumption for commercial and industrial uses can be separated using information provided in the BAAQMD regional emissions inventory (Tholen, pers. comm., 2009). For 2020 projections, annual average growth rates were developed from EIA forecasts from 2007 to 2020. For 2050 projections, annual average growth rates were developed from EIA forecasts from 2007 to 2030, which is the farthest year for which EIA forecasts energy consumption. These growth rates were applied to the baseline 2004 energy consumption levels to project 2020 and 2050 electricity

and natural gas consumption for residential and commercial/industrial land uses. Table A-3 presents the annual average growth rates for land uses and energy sources between 2007–2020 and 2007–2030 provided by EIA.

Baseline (2004) emissions calculations were based on PG&E-specific emission factors for both electricity and natural gas consumption. Although electricity, and to a lesser extent, natural gas delivery emission factors would be anticipated to decrease with time and improved technology, these factors represent the most accurate emission factors available describing Albany's future energy consumption trends.

Transportation

As shown in previous Table A-2, Albany's transportation-related GHG emissions are expected to decrease by 675 $MTCO_2e$ by 2020, and increase by 6,272 $MTCO_2e$ by 2050, a 3% net decrease and 27% net increase relative to the 2004 baseline, respectively. The projected decrease in 2020 transportation-related emissions can be attributed to lower emission rates of GHGs from newer vehicles. In 2020, decreased emissions from individual vehicles would likely to outweigh expected increases in VMT. However, in 2050, the projected increase in transportation-related emissions occurs largely because projected increases in VMT outweigh decreased vehicle emissions resulting from improved fuel efficiency.

Table A-3.
Summary of Emission Sector Growth Rates

Emission Sector	Average Annual Growth Rate (2007–2020) [1]	Average Annual Growth Rate (2007–2030) [2]
Residential Energy Consumption – Natural Gas	1.05%	0.79%
Residential Energy Consumption – Electricity	0.60%	0.60%
Commercial Energy Consumption – Natural Gas	0.17%	0.21%
Industrial Energy Consumption – Natural Gas	-0.52% [3]	0.15%
Commercial Energy Consumption – Electricity	0.92%	0.91%
Industrial Energy Consumption – Electricity	0.54%	0.72%
Average Commercial/Industrial Energy Consumption – Electricity [4]	0.73%	0.82%
Transportation – Vehicle Miles Traveled [5]	0.73%	0.73%
Water Consumption – Gallons Consumed [5]	-0.02%	-0.02%

Source: EIA 2009.

[1] 2007-2020 average annual growth rates are used within the 2020 GHG projections.

[2] 2007-2030 average annual growth rates are used within the 2050 GHG projections.

[3] The negative average annual growth rate indicates a decrease in natural gas consumption for industrial land uses.

[4] Average commercial/industrial electricity growth rates are used to project commercial and industrial electricity use to account for limitations in the 2004 baseline due to the 15/15 Rule.

[5] The same annual average growth was used to project 2020 and 2050 activities.

Albany's mobile source transportation activity for 2020 and 2050 was projected using historical Albany-specific VMT data from the Federal Highway Administration's (FHWA) High Performance Monitoring System (HPMS) published by Caltrans (Caltrans 2007). Based on historical VMT data on local public roads for Albany from 2001 to 2007, an annual average VMT growth rate of 0.7% (shown above in Table A-3) was applied to baseline 2004 VMT data to project Albany's 2020 and 2050 VMT.

An Alameda County-specific emission factor for gasoline and diesel fuel from EMFAC 2007 was used to calculate projected CO_2 emissions associated with projected VMT in Albany. Forecasted Alameda County population, VMT, and fuel consumption data for 2020 and 2050 by vehicle class were used to calculate weighted-average fuel efficiencies (i.e., miles per gallon) for both gasoline- and diesel-fueled vehicles. The 2020 and 2050 projected VMT data for both gasoline- and diesel-fueled vehicles was then divided by the weighted-average fuel efficiencies to calculate gallons of gasoline and diesel fuel consumed. The total gallons of gasoline and diesel fuel consumed were multiplied by the EMFAC2007 emission factors to calculate CO_2 emissions.

CCAR's *General Reporting Protocol* Version 3.1 provides N_2O and CH_4 emission factors for gasoline- and diesel-fueled vehicles by vehicle class (CCAR 2009). These factors were weighted using Alameda County-specific vehicle class population and distribution information, then multiplied by projected 2020 and 2050 VMT, respectively, to calculate projected N_2O and CH_4 emissions. The N_2O and CH_4 emissions were then weighted by their GWP and added to CO_2 emissions to obtain $MTCO_2e$.

Waste

As shown in Table A-2, Albany's waste-related GHG emissions are expected to decrease by 839 $MTCO_2e$ by 2020, a 23% net decrease relative to the 2004 baseline. City waste disposal data was used to project Albany's 2020 solid waste disposal needs. The City has established a goal to reduce the amount of solid waste disposed from 1990 levels by 90% by 2030. The Alameda County Waste Management Authority and Source Reduction and Recycling Board (operating together as StopWaste.org) provided solid waste disposal data (i.e., tons of solid waste entering landfills) for multiple benchmark years, which were used to interpolate the City's 2020 solid waste disposal assuming a linear path to the 2030 90% reduction goal. This projection does not include 2050 waste-related GHG emissions, due to the uncertainty of solid waste disposal following achievement of the 2030 goal.

CACP was used to quantify GHG emissions associated with 2020 solid waste disposal levels of using nationally-averaged emission factors for various types of waste. The projected GHG emissions were calculated assuming the same percent distributions for solid waste disposal categories as used in the baseline inventory.

Water Consumption

As discussed above, EBMUD provided historical water consumption data (1976-2008) for Albany. Given the variability of annual water consumption growth rates during this period, water consumption for 2020 and 2050 was projected using the annual average water consumption growth rate from 1990–2008 in Albany. Table A-3 shows the annual average growth rate used to project Albany's 2020 and 2050 water consumption.

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Appendix B.

Measure Greenhouse Gas Reduction Estimates

Appendix B: Climate Action Plan Strategies Calculations Detail and Assumptions

This appendix summarizes the assumptions and parameters used to calculate greenhouse gas (GHG) emission reduction performance of CAP measures.

Summary Table

Measure Number and Title	Scaled % GHG Emission Reduction	GHG Emission Reduction (MT CO_2e/year)
BE-1.1: Zero-Emission City Buildings by 2015	0.96%	150
BE 2.1: Energy Efficiency and Renewable Energy Investments	18.74%	2,935
BE-2.3: Residential and Commercial Energy Efficiency Retrofit	8.37%	1,310
BE-2.4: Empowerment Districts	14.02%	2,195
BE-3.1: Meet Green Building Code in New Construction	9.90%	1,550
BE-4.1: Smart Grid	1.02%	160
BE-4.2: LED Street Lights	1.09%	170
BE-4.3: Community Choice Aggregation	– [1]	– [1]
BE-4.4: Comparative Energy Billing	0.83%	130
TL-1.1: Expand and Enhance Bicycle Infrastructure (Stage 1)	– [2]	110
TL-1.1: Expand and Enhance Bicycle Infrastructure (Stage 2)	1.95%	305
TL-1.2: Bike Parking	1.47%	230
TL-1.3: Walking Infrastructure	3.90%	610
TL-1.5: Commercial Use Diversity	7.34%	1,150
TL-2.2: Transit Stops and Safety Infrastructure	0.73%	115
TL-2.3: Free Transit Passes and Shuttles for City Employees	0.07%	11
TL-3.1: Public Education	0.45%	70
TL-3.2: Design and Density	5.04%	790
TL-4.1: Jobs/Housing Balance	1.44%	225
TL-4.2: Improve Fuel Efficiency of City Vehicle Fleet	0.12%	19
TL-4.4: TDM Program	7.28%	1,140
WR-1.1: Waste Reduction Ordinance	14.11%	2,210
GI-1.1: Street Trees	0.83%	130
WC-1.1: Residential and Commercial EBMUD Water Audit	0.03%	5
WC-1.2: Residential and Commercial Outdoor Water Conservation	0.03%	5

Summary Table		
Measure Number and Title	**Scaled % GHG Emission Reduction**	**GHG Emission Reduction (MT CO_2e/year)**
WC-2.1: New Construction and Remodel Indoor Water Efficiency	0.16%	25
WC-2.2: New Landscape Project Outdoor Water Efficiency	0.13%	20
Total GHG Emission Reductions	–	15,660

[1] Community Choice Aggregation is not included in the summary because different ranges of GHG-free electricity portfolios would also affect the GHG reduction potential of other electricity efficiency-related reduction measures. See Chapter III or Measure BE-4.3 below for detailed descriptions of the measure and its reduction potential.

[2] Stage 1 of Measure TL-1.1 is noted included in the summary because Stage 2 includes the cumulative GHG reduction potential of Stage 1 and 2. Therefore, if Stage 1 was included, Measure TL-1.1 would be double counted.

Municipal Building Measures

Measure BE-1.1: Install cost-effective renewable energy systems on all City buildings and install building performance data displays to demonstrate savings.

This measure is based on a three-tier approach to reducing energy consumption from the City's buildings. The first tier includes implementation of energy efficiency measures to reduce the amount of energy used by City buildings. The second tier includes the installation of renewable energy systems on City buildings to serve energy demands. The third tier includes purchasing all remaining energy demands from renewable sources (i.e., solar, wind, and hydroelectric sources). To demonstrate energy savings to the public, the City would install building performance data displays. Implementation of this measure would reduce the total GHG emissions associated with all City buildings. The City was able to provide their current building energy consumption, which was used to calculate the GHG emission reduction using the same PG&E-specific emission factor used to calculate the City's GHG emissions associated with electricity consumption.

Measure value = 150 MT/year

Residential and Commercial Energy Efficiency Retrofit Measures

Measure BE-2.1: Develop comprehensive outreach programs to encourage energy efficiency and renewable energy investments in the community.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
6%	8.49% (Electricity)	4%	0.02%	10
14%	20.86% (Natural gas)	4%	0.13%	90
Total			**0.15%**	**100**

Sources of information:

California Energy Commission [CEC] 2003. Impact Analysis 2005 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings;

California Energy Commission [CEC] 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
6%	12.37% (electricity)	8%	0.06%	45
9%	11.66% (natural gas)	8%	0.08%	60
Total			**0.14%**	**105**

Sources of information:

California Energy Commission [CEC] 2003. Impact Analysis 2005 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings;

California Energy Commission [CEC] 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings

It was assumed that 100% of electricity would be generated by renewable energy for all participating (assumed 20%) units from solar panels and a 70% reduction in natural gas would occur for solar water heating.

Strategy	Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector	Sub Sector	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
Solar panels	100%	9.01% (electricity, residential)	-	20%	1.80%	1,300
Solar water heaters	70%	23.72% (natural gas, residential)	60%	20%	1.99%	1,430
Total					**3.79%**	**2,730**

Measure BE-2.3: Develop and implement point-of-sale residential and commercial energy efficiency upgrades.

These measures assume a performance standard of a 20% increase in energy efficiency in existing residential units.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
6%	8.49% (Electricity)	43%	0.21%	150
14%	20.86% (Natural gas)	43%	1.29%	895
Total			**1.50%**	**1,045**

Sources of information:

California Energy Commission [CEC] 2003. Impact Analysis 2005 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings;

California Energy Commission [CEC] 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings

These measures would improve energy efficiency of commercial buildings by 15% for both natural gas and electricity consumption.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
6%	12.37% (electricity)	21%	0.16%	115
9%	11.66% (natural gas)	21%	0.21%	150
Total			**0.38%**	**265**

Sources of information:

California Energy Commission [CEC] 2003. Impact Analysis 2005 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings;

California Energy Commission [CEC] 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings

Nonresidential Energy Efficiency Retrofit Measures

Measure BE-2.4: Identify and facilitate solar energy EmPowerment districts in commercial, industrial, and mixed-use portions of the City.

This measure is based on the availability of commercial, industrial, and mixed-use roof space for the installation of solar panels. Available commercial, industrial, and mixed-use roof square footage was determined using ArcGIS software. The amount of feasible solar panel square footage was calculated assuming 65% of the total roof space could be used for solar panels. A participation rate of 40% was applied to the total square footage.

The solar potential of the feasible roof space was calculated using assumptions regarding the wattage potential and hours of operation. Solar panels were assumed to generate 10 watts per square foot and operate for at this capacity for 4 hours per day. These assumptions were used to calculate the total kilowatt-hours generated from implementation of the measure. The GHG reduction potential of this measure was calculated using the same PG&E-specific electricity consumption emission factor used to calculate the City's GHG emissions associated with electricity consumption.

Solar Photovoltaic:

Percent of Feasible Solar Roof	Participation Rate	Solar Potential (watts/square foot)	Operational Time (hours/year)	GHG Emissions Reduction (MT/year)
65%	40%	10	1,460	1,730

Solar Hot Water:

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector	Sub Sector	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
70%	11.53% (natural gas, non-residential)	40%	20%	0.65%	465

Total Measure performance = 2,195 MT/yr

Sources of information:

California Energy Commission [CEC] 2005. Electricity Usage During Peak Periods. Available: http://www.energy.ca.gov/electricity/peak_loads.html

Measure BE-3.1: Require new construction to comply with Tier 2 energy efficiency standards contained within section 503.1.2 of the California Green Building Code.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Inventory (MT GHG/year from new growth)	GHG Emissions Reduction (MT/year)
44.84% (residential electricity)	558	250
35.95% (residential natural gas)	2,512	900
33.43% (non-residential electricity)	1,010	340
36.58% (non-residential natural gas)	160	60
Total		**1,550**

Sources of information:

California Energy Commission [CEC] 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings

Measure BE-4.1: Partner with other neighboring cities and PG&E to fast-track "Smart Grid" technology in Albany.

This measure would catalyze the City's integration into the "Smart Grid" system. The "Smart Grid" system would help the City manage and serve its electricity demand more efficiently in every demand scenario (e.g., peak, off-peak). The City's integration into the "Smart Grid" system is anticipated to reduce total electricity consumption from both the residential and non-residential sector by 4%.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Electricity)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
4%	9.01% (residential)	25%	0.09%	65
4%	13.40% (non-residential)	25%	0.13%	95
Total			**0.22%**	**165**

Measure BE-4.2: Work with Alameda County to convert all street lights to LED bulbs or LED-solar systems.

This measure is based on the energy efficiency of LED bulbs or LED-solar systems with respect to the existing street light system. The GHG emission reduction potential of this measure was calculated conservatively assuming that all street lights would be converted to LED bulbs and not LED-solar systems. The energy savings associated with this measure were calculated assuming LED bulbs are 70% more energy efficient than the existing street lights. The City was able to provide total kilowatt-hours used for the existing streetlight system, to which the 70% reduction was applied. The GHG emission reduction associated with this measure was calculated using the same PG&E-specific electricity consumption emission factor used to calculate the City's GHG emissions associated with electricity consumption. In reality, this measure may have a greater GHG emission reduction potential due to the installation of solar systems in addition to the LED bulbs.

Measure performance = 170 MT/year

Measure BE-4.3: Research the feasibility of joining Community Choice Aggregation efforts of Berkeley, Oakland, Emeryville, and other neighboring cities.

The benefits of a CCA are directly relevant to GHG reduction efforts, as communities are able to proactively determine the amount of GHG-free energy (e.g., renewable, hydro-electric, nuclear) they purchase. Joining the CCA would allow the City to independently select electricity providers. The City would be able to reduce their electricity-related GHG emissions by selecting an electricity-supply portfolio that utilizes more GHG-free energy sources than the current Pacific Gas and Electric (PG&E) portfolio. The current PG&E electricity portfolio is comprised of 55% GHG-free sources; therefore, in order for the CCA to provide a net benefit in GHG reductions, it is assumed that the City's CCA portfolio would range from 60–100% GHG-free electricity generation sources. The range of GHG-free portfolio mixes (i.e., 60 to 100%) was used to adjust the current PG&E-specific electricity emission factor assuming the same ratio of GHG-producing sources (i.e., natural gas and coal) would continue with the CCA.

An issue with implementation of the CCA is that the CCA would reduce the GHG emissions reduction potential of other Building Energy measures because less GHG emissions would be generated by electricity consumption. If the CCA purchased 100% of its electricity from GHG-free sources, the reduction potential of other electricity conservation or renewable electricity generation measures would be nullified. If the CCA purchased 60% of its electricity from GHG-free sources, the impact to the reduction potential would be minimal. For this reason, the potential CCA is stated independently below, but is not included in the Summary Table above.

Measure performance with 60% GHG-free sources = 1,800 MT/year
Measure performance with 100% GHG-free sources = 16,140 MT/year

Measure BE-4.4: Encourage PG&E and EBMUD to provide comparative energy and water conservation metrics on utility bills.

As part of this measure, PG&E would provide comparative energy consumption data for neighborhoods within individual energy bills. The energy bills will include both energy and water efficiency measures that customers can implement and other ways to reduce energy and water consumption. This type of comparative energy billing was found to reduce energy consumption by 2% over the course of a year.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Residential Electricity)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
2%	9.01%	100%	0.18%	130

Transportation and Land Use

Measure TL-1.1: Expand and enhance bicycle infrastructure throughout the City.

Complete streets include bike lanes and pedestrian sidewalks on both sides of streets, traffic calming features such as pedestrian bulb-outs, cross-walks, traffic circles, and elimination of physical and psychological barriers (e.g., sound walls and large arterial roadways, respectively). Depending on the level of implementation of this measure, the performance in vehicle trip and vehicle miles traveled reduction can range from 1–5%. It was assumed that nearly all of the listed criteria for a complete street would be met, and the performance of this measure would correspond to the upper end of the range (i.e., 4%). Bicycle infrastructure would account for 1/3rd of the reduction associated with this measure while pedestrian infrastructure (Measure TL-1.3 discussed below) would account for the remaining reduction potential (2/3rd).

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
4%	31.99%	100%[a]	1.28%	305
[a] 100% participation indicates that this measure would be applicable community-wide.				

Sources of information:

Dierkers, G., E. Silsbe, S. Stott, S. Winkelman, an M. Wubben. 2007. CCAP Transportation Emissions Guidebook. Center for Clean Air Policy. Washington, D.C. Available: <http://www.ccap.org/safe/guidebook.php>. as cited in California Air Pollution Control Officers Association (CAPCOA) 2008. CEQA and Climate Change.

Measure TL-1.2: Install bicycle racks in commercial and civic areas of City where racks do not currently exist.

This measure was expected to reduce vehicle trips, and associated GHG emissions by 1%.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
1%	31.99%	100%	0.32%	230

Sources of information:

Victoria Transport Policy Institute. 2009. Online TDM Encyclopedia (Bicycle Parking). Available: <http://www.vtpi.org/tdm/tdm85.htm>. Accessed 2009.

Measure TL-1.3: Evaluate the community's walking infrastructure, identify potential barriers, and implement improvements.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
4%	31.99%	100%	1.28%	610

Sources of information:

Dierkers, G., E. Silsbe, S. Stott, S. Winkelman, an M. Wubben. 2007. CCAP Transportation Emissions Guidebook. Center for Clean Air Policy. Washington, D.C. Available: <http://www.ccap.org/safe/guidebook.php>. as cited in California Air Pollution Control Officers Association (CAPCOA) 2008. CEQA and Climate Change.

Measure TL-1.5: Encourage additional neighborhood serving commercial uses and mixed-use development within City's existing commercial districts. Strive to provide access to daily goods and services within 1/4 mile of residences.

The performance of this measure is related to the elasticity of increased diversity of uses. The literature supports a 5% reduction in vehicle miles traveled for every 100% increase in land use diversity. For the City, it was assumed that this measure would result in a 100% community-wide increase in diversity by dispersing commercial uses in residential neighborhoods that currently do not have access to neighborhood serving retail.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
5%	31.99%	100%	1.60%	1,150

Sources of information:

Ewing, Reid, et al. 2001. Travel and the Built Environment: A Synthesis. Transportation Research Record 1780. Paper No. 01-3515 as cited in Urban Land Institute. 2008. Growing Cooler. ISBN: 978-0-87420-082-2. Washington, DC

Measure TL-2.2: Work with AC transit to provide transit stops with safe and convenient bicycle and pedestrian access and essential improvements such as shelters, route information, benches and lighting.

This measure was assumed to reduce vehicle trips and associated emissions by 0.5%.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
0.50%	31.99%	100%	0.16%	115

Sources of information:

Dierkers, G., E. Silsbe, S. Stott, S. Winkelman, an M. Wubben. 2007. CCAP Transportation Emissions Guidebook. Center for Clean Air Policy. Washington, D.C. Available: <http://www.ccap.org/safe/guidebook.php>. as cited in California Air Pollution Control Officers Association (CAPCOA) 2008. CEQA and Climate Change.

Measure TL-2.3: Provide passes and shuttles to transit to encourage use of alternative transportation by City employees.

This measure was assumed to reduce City worker commute trips based on a survey conducted by the City's Transportation Department and average commute distances within the City.

Unscaled Measure Performance (% employees to use pass)	Total City Employees	Miles Per Commute Trip (miles/day)	Work Days Per Year	GHG Emissions Reduction (MT/year)
40%	130	2	240	11

Measure TL-3.1: Provide public education about benefits of well-designed, higher-density housing and relationship between land use and transportation.

This measure is related to the implementation of a comprehensive community-wide public education campaign to inform residents, businesses, and consumers about the incentive programs that would be implemented as part of the CAP designed to reduce GHG emissions. This measure is based on empirical data from a public education campaign designed to reduce emissions of criteria air pollutants in the Sacramento region (i.e., the Spare the Air program). The Sacramento region conducted an analysis of the effectiveness of the Spare the Air program as it relates to emission reduction. The analysis confirmed that approximately 1% of people changed their behavior (e.g., took fewer vehicle trips on Spare the Air days) as a result of the Spare the Air campaign.

For the City's public education campaign, it was assumed that approximately 1% of people would reduce their emissions from all sectors (e.g., transportation, electricity, natural gas, waste, water) by about 10%.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (all)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
10%	100%	1%	0.10%	70

Sources of information:

Based on SMAQMD 2009. Spare the Air Control Measure Program; Revision to State Implementation Plan Staff Report.

Measure TL-3.2: Update planning documents to promote high-quality, mixed-use, pedestrian- and transit-oriented development in the San Pablo/Solano Avenue commercial districts.

The performance of this measure is related to the elasticity of design. The literature supports a 3% reduction in vehicle miles traveled for every 100% improvement in design. For the City, it was assumed that this measure would result in a 100% community-wide increase in design.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
3%	31.99%	100%	0.96%	690

Sources of information:

Ewing, Reid, et al. 2001. Travel and the Built Environment: A Synthesis. Transportation Research Record 1780. Paper No. 01-3515 as cited in Urban Land Institute. 2008. Growing Cooler. ISBN: 978-0-87420-082-2. Washington, DC

The performance of this measure is related to net population density. The performance of this measure is based on the following formula:

Step 1. 2005 Density = 16,800 Population year *2005*
+ 4,840 Employees year *2005* =
21,640 persons ÷ 1.5 square miles = 14,427 persons/sq.mile in year 2005

Step 2. 2020 Density = 18,043 Population year *2020*
+ 5,493 Employees year *2020* =
23,536 persons ÷ 1.5 square miles = 15,691 persons/sq.mile in year 2020

Step 3. Density Change = 15,691 persons/sq.mile
- 14,427 persons/sq.mile =
1,264 persons/sq.mile ÷14427 persons/sq.mile = 0.0876 = **8.76% increase in density between 2005 and 2020**

The performance of this measure is related to the elasticity of increased density. The literature supports a 5% reduction in vehicle miles traveled for every 100% increase in density. For the City, it was assumed that this measure would result in approximately 8.76% community-wide increase in density by 2020, per the calculation above.

8.76% (increase in density) * 5% (reduction in VMT) = **0.438% reduction in VMT**

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
0.44%	31.99%	100%	0.14%	100

Sources of information:

Criterion Planners. 2008. Appendix A - 5D Method Technical Memorandum, INDEX Planbuilder Manual. Portland, OR.

Ewing, Reid, et al. 2001. Travel and the Built Environment: A Synthesis. Transportation Research Record 1780. Paper No. 01-3515 as cited in Urban Land Institute. 2008. Growing Cooler. ISBN: 978-0-87420-082-2. Washington, DC

Measure TL-4.1: Work with ABAG and neighboring cities to improve jobs-housing balance within the City and regional transit corridors.

This measure's performance is based on the formula:

Trip reduction = (1- (ABS (1.5 * h – e) / (1.5 * h + e)) – 0.25) / 0.25 * 0.03

Where: h = study area households (or housing units)
e = study area employment

Under existing conditions (2005), Albany had 7,130 households and 4,840 jobs, with a jobs/housing ratio of 0.68.

According to ABAG 2020 projections under the Focused Future growth scenario, Albany would accommodate approximately 7,619 housing units and 5,493 jobs (jobs/housing = 0.72).

Trip reduction (existing 2005) = (1 – (ABS (1.5 * 7,130 – 4,840)/(1.5 * 7,130 + 4,840)) – 0.25) / 0.25 * 0.03 = 0.0448 = 4.48%

If Albany were to improve jobs/housing balance by 20% from existing conditions (i.e., jobs/housing = 0.68), the jobs/housing ratio would be 0.81. If housing were expected to remain constant at the projected 7,619 households in the year 2020, the number of jobs needed to achieve a jobs/housing balance of 0.81 would be 6,206 jobs. Substituting HH = 7,619 and jobs = 6,206 into the formula below:

Trip reduction (20% above 2005) = (1 – (ABS (1.5 * 7,619 – 6,206)/(1.5 * 7,619 + 6,206)) – 0.25) / 0.25 * 0.03 = 0.0545 =5.45%

Trip reduction (existing 2005) – Trip reduction (20% above 2005) = 0.0448 - 0.0545 = -0.00973 = -0.973%

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
0.97%	31.99%	100%	0.31%	225

Sources of information:

Nelson/Nygaard Consultants. 2005. Crediting Low-Traffic Developments: Adjusting Site-Level Vehicle Trip Generation Using URBEMIS. Pg 12, (adapted from Criterion and Fehr & Peers, 2001)

Measure TL-4.2: Improve the fuel efficiency of the City vehicle fleet by purchasing low or zero-emissions vehicles when vehicles are retired from service.

Although some vehicles would be replaced with zero-emissions vehicles (i.e., electric vehicles), this measure assumes at a minimum, all City-owned, non-emergency light-duty automobiles and light-duty trucks would meet the fuel efficiency requirements of AB 1493.

Measure performance = 19 MT/year

Measure TL-4.4: Create and implement a voluntary transportation demand management (TDM) program to reduce weekday peak period single car occupancy commute and school trips.

The performance of this measure is a function of the performance standard set for the TDM program. The measure applies to commute trips only, which compose approximately 33% of trips in Alameda County (according to URBEMIS 2007).

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
15%	31.99%	33%	1.58%	1,140

Sources of information:

Rimpo and Associates. 2008. URBEMIS 2007 v.9.2.4. Urban Emissions Model. Available: http://www.urbemis.com.

Waste Reduction

Measure WR-1.1: Establish a citywide zero-waste stream target for 2030.

This measure originates from the StopWaste.org goal to achieve a 90% reduction from 1990 waste disposal levels by 2030. The GHG emissions reduction associated with this measure were calculated using the ICLEI CACP software. The CACP software contains nation-wide emission factors for various categories of waste. As discussed in Chapter IV Baseline, the percent distributions of waste categories from the *Alameda County Waste Categorization Study* were used to calculate GHG emissions using the CACP software. Waste categories from the *Alameda County Waste Categorization Study* were combined to better match the CACP software categories. The reduction in waste disposal (tons) from 2004 levels to projected 2020 levels (i.e., 80% below 1990 baseline) was used to calculate total GHG emission reductions. Waste categorization percentages were assumed to remain constant from 2004 to 2020.

Measure performance = 2,210 MT/yr

Green Infrastructure

Measure GI-1.1: Enhance the Urban Forestry/Urban Plants Program to maximize carbon sequestration on all public and private lands, including rooftops. Prepare a Green Albany Plan to evaluate all potential "growing areas", including parks, streets, rights-of-way, parking lots, and rooftops, for carbon sequestration.

This measure is based on the CO_2 sequestration rates of 500 trees planted in the City each year from 2010 to 2019. Carbon sequestration rates specific to the species and age of the planted trees were used calculate the annual sequestration potential of the trees from 2009 to 2020. The City's forester stated that with additional funding, Albany could plant 500 street trees per year over the next ten years.

Total value of measure: 130 MT/year

Sources of information:

The Center for Urban Forest Research Tree Carbon Calculator. Available:<http://www.fs.fed.us/ccrc/topics/urban-forests/>

USDA Forest Service, Pacific Northwest Research Station. "California Study Shows Shade Trees Reduce Summertime Electricity Use." Science Daily 7 January 2009. 20 February 2009 <http://www.sciencedaily.com/releases/2009/01/090105150831.htm>.

California Energy Commission [CEC] 2005. Electricity Usage During Peak Periods. Available: <http://www.energy.ca.gov/electricity/peak_loads.html>

California Energy Commission [CEC] 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings

Water Conservation

Measure WC-1.1: Encourage residential and commercial users to participate in EBMUD's free water audit program.

This measure is based on residential water consumption data provided by EBMUD. EBMUD was able to provide percentage of water consumed for single-family (SFR) and multi-family (MFR) residential units, the percent of indoor and outdoor water use for both SFR and MFR, and the percent of indoor water use associated with faucets and leaks. This measure's water efficiency actions would reduce indoor water faucet efficiency by 40% and eliminate all indoor leaks. It was assumed that 3% of the residential homes within the City would participate in this water efficiency measure.

Percent of Total Water Consumption	Percent Indoor Water Consumption	Percent Indoor Water Consumption to Faucets	Percent Indoor Water Consumption to Leaks	Participation Rate	Total GHG Emissions Reduction (MT/year)
46% (SFR)	62% (SFR)	69%	8%	3%	5
17% (MFR)	86% (MFR)	69%	8%	3%	

Measure WC-1.2: Encourage 50% reduction in outdoor potable water usage for existing residential and commercial properties.

Percent of Total Water Consumption	Percent Outdoor Water Consumption	Percent Reduction of Outdoor Water Consumption	Participation Rate	Total GHG Emissions Reduction (MT/year)
46% (SFR)	38% (SFR)	50%	4%	5
17% (MFR)	14% (MFR)	50%	4%	

Measure WC-2.1: Require new construction and major remodels to achieve indoor water efficiency 20% above the California Building Standards Code.

Percent of Total Water Consumption	Percent Indoor Water Consumption	Percent Indoor Water Consumption to Faucets	Percent Indoor Water Consumption to Leaks	Participation Rate	Total GHG Emissions Reduction (MT/year)
46% (SFR)	62% (SFR)	69%	8%	18%	25
17% (MFR)	86% (MFR)	69%	8%	18%	

Measure WC-2.2: Require new landscape projects to reduce outdoor potable water use by 50%.

Percent of Total Water Consumption	Percent Indoor Water Consumption	Percent Indoor Water Consumption to Leaks	Participation Rate	Total GHG Emissions Reduction (MT/year)
46% (SFR)	62% (SFR)	8%	53%	20
17% (MFR)	86% (MFR)	8%	53%	

Senate Bill 107

SB 107 requires utilities to establish renewable energy portfolios of 20% by 2010, which would result in reduction of GHG emission factors associated with electricity generation and consumption. It was assumed that GHG emissions associated with electricity consumption in Albany would be reduced by 20% between the base year (2004) and 2020 associated with the implementation of this legislation. When SB 107 was taken into account in 2020 GHG emissions projections, growth in population and associated emissions in Albany would be outpaced by the reduction in emission factors associated with renewable energy portfolio standard.

Unscaled Regulation Performance	Emissions Sector (electricity)	Scaled Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
6%	22%	1.34%	968

Assembly Bill 1493 (Pavley)

AB 1493, California's mobile-source GHG emissions regulations for passenger vehicles, was signed into law in 2002. AB 1493 has not been implemented at the time of writing, because California has not received federal approvals to implement these emissions standards. This authorization to implement more stringent standards in California was requested in the form of a CAA Section 209, subsection (b) waiver in 2005. Since that time, EPA failed to act on granting California authorization to implement the standards. It appears likely that AB 1493 will be implemented in the near future, as the new presidential administration has directed EPA to reexamine its position for denial of CCAA's waiver and for its past opposition to GHG emissions regulation. California received the waiver on June 30, 2009.

The CO_2 reduction associated with the foreseeable implementation of AB 1493 is currently unknown. The ARB's AB 32 Scoping Plan (the State's plan for implementing AB 32) expects approximately a 19.7% reduction in on-road mobile-source GHG emissions (ARB 2008[1]). The AB 32 Scoping Plan also notes that "AB 32 specifically states that if the Pavley regulations do not remain in effect, ARB shall implement alternative regulations to control mobile sources to achieve equivalent or greater reductions of greenhouse gas emissions (HSC §38590)." Thus, it is reasonable to assume implementation of AB 1493 standards, or equivalent programs that would be implemented by ARB.

Because AB 1493 allows automakers two years lead time prior to the first model year of regulation, if AB 1493 were implemented in 2009, the earliest model year that would reasonably be expected to be regulated would be model year 2012.

It was assumed that AB 1493 would be 80% implemented by the year 2020 (allowing for two years of delay). Thus, the likely effect of AB 1493 on mobile-source GHG emissions in Albany was assumed to be approximately 15.76%.

Unscaled Emission Reduction	Sector (Transportation)	Scaled Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT/year)
15.76%	31.99%	5.04%	3,629

[1] California Air Resources Board. 2008 (December). *Climate Change Proposed Scoping Plan*. Sacramento, CA. Available: <http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm>. Last updated December 2008. Accessed May 18, 2009.

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Appendix C.

Measure Cost Analysis

Albany Climate Action Plan - Draft GHG Reduction Strategies 5/17/09

Buildings and Energy Strategy - Minimize energy consumption, create high performance buildings, and transition to clean renewable energy sources

Objective BE-1: Lead by example with zero-emission City buildings by 2015

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
BE-1.1	Install cost-effective renewable energy systems on all city buildings, and install building performance data displays to demonstrate savings.	See below	See below	See below	See below	See below	See below	See below
A	Renewable energy systems	SolarCity	No Cost (Leasing)	No Cost (Leasing)	No Cost (Leasing)	No Cost (Leasing)	N	Assume City will participate in a Power Purchase Agreement (PPA) with solar company to lease panels at no cost to City.
B	Building perfomance data displays	Lucid Design Group	$61,000	$81,000	$71,000	$7,100	N	Dashboard starter (electricity only): $10,000 - $30,000 + $950 for each additional resource (assume city will monitor electricity and water). Annual service fee + data hosting: $3,000 per year. Free for first year. City has 5 main public buildings. Touch screen available + installation: $9,950 (32 inch f screen + preconfigured). Grand Total: $61,000 - $81,000

Objective BE-2: Retrofit existing residential and commercial buildings to increase energy efficiency and maximize use of renewable energy

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
BE-2.1	Develop comprehensive outreach programs to encourage energy efficiency and renewable energy investments in the community.	EDAW	-	-	$107,140	$13,395	N	We are assuming many marketing/education-related strategies could be addressed concurrently. EDAW community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume 4 advertising campaigns would take place for the CAP = $300,000 for all 14 strategies
BE-2.2	Identify and develop low-cost financing products and programs that encourage investment in energy efficiency and renewable energy within existing residential units and commercial buildings.	See below	See below	See below	See below	See below	See below	See below
A	On-bill Financing	Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis	-	-	-	$1,316	Depends on the efficiency of the on-site energy efficiency improvements and alternative energy installed.	City could coordinate with PG&E to facilitate the repayment of loans for efficiency upgrades on utility bills. Upgrades would be selected by the building owner (in coordination with the City) such that the efficiency savings would pay for the investment over a fixed period of time. Customers would "share" monthly energy efficiency savings with the utility until the loan is paid back, at which point all savings would be reflected in lower monthly bills. The goal is to simplify loan repayment and (in combination with a funding source) reduce upfront cash outlay by property owners. In addition, some models of on-bill financing would allow for the loan to remain with the property (even if sold by the current owner), thereby sharing the cost of upgrades over time with future beneficiaries of those upgrades. Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)
B	Low Interest Loans	Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis	$140,000	$1,150,000	$645,000	$80,625	Depends on the efficiency of the on-site energy efficiency improvements and alternative energy installed.	The City, utilities, or private lenders could offer loans to property owners for pre-approved energy efficiency upgrades. Low interest rates could be guaranteed through volume or by City buy-down. The goal is to to provide capital for energy efficiency upgrades at a discounted rate. Initial Costs: Policy assessment: $20,000 - $50,000. The City would need to assess strategies for maximizing the effectiveness of a low interest loan program, educating a contractor/auditor network and addressing the split incentives between investors and energy end-users (e.g., between a landlord and tenant). Development of billing and collection process: $20,000 - $100,000. If the City manages the loan program in-house and intends to affix the loan to the property, then a repayment system would have to be arranged. Initial or Annual Costs (depending on structure of financing): City investment: $100,000-$1,000,000. This investment is wholly dependent on how much the City intends to subsidize interest rates.
C	Energy Efficiency Mortgages	Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis	$20,000	$150,000	$85,000	$20,000	N	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. Initial Costs: Partner development: $20,000 – $50,000. Costs to the City would generally be low because these products would be administered through private lenders, but the City would need to devote some financial resources to assisting with partner recruiting. Technology upgrades: $0 – $100,000. Depending on the City's role in administration, there may be costs incurred in development of a database to track and verify energy efficiency upgrades in participating properties.
D	Revolving Loan from Bond Sale	Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis	$60,000	$150,000	$105,000	$13,125	Depends on the efficiency of the on-site energy efficiency improvements and alternative energy installed.	Energy savings could be financed through a (potentially tax-exempt) municipal bond issue. The City would administer a revolving loan fund with the bond proceeds. The goal is to provide capital for energy efficiency upgrades at the lowest cost of capital possible. Initial Costs: Policy assessment: $40,000 - $100,000. Further research would be needed to consider whether the City's internal funds would be a better (less expensive, more flexible) option than bonds. Technology upgrades: $20,000 - $50,000. Depending on the repayment mechanism and administrative system chosen by the City, some costs would be incurred for establishing a tracking system to manage the loan fund that resu from the revenue bond issue.
E	Energy Efficient Local Improvement District	Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis	$150,000	$500,000	$325,000	$40,625	Depends on the efficiency of the on-site energy efficiency improvements and alternative energy installed.	Monitoring and enforcement cost: Implementation costs to the City are largely dependent on the capacity of the City for policy administration and enforcement. Additional staff training would need to take place to ensure officials fully understand the code requirements. Additional staff may also be required in order to meet the increased administration and implementation workload, particularly in the period immediately prior to and following the code's implementation. While implementation costs are likely to be high, once introduced, ongoing policy development costs to the City are likely to be manageable as updates would be conducted in line with the City's existing cyclic code review process. Initial Costs: Cost of Adopting an Ordinance + Training City Staff to administer program/process applications: ~$10,000 - possible additional education and outreach related expenses. Annual Costs: Monitoring and enforcement cost: ~$10,000 + possible additional staff
BE-2.3	Develop and implement point-of-sale residential and commercial energy efficiency upgrade requirements.	See below	See below	See below	See below	See below	See below	See below
A	Residential	-	-	-	-	$1,316	Possible increased capital costs that could be off set by increased the property value of an energy efficient home.	Cost of developing ordinance; ENERGY STAR for Homes, BOMA Energy Performance Contract. Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)
B	Commercial	-	-	-	-	$1,316	Possible increased capital costs that could be off set by long-term energy bill savings and increased property value as an energy efficient building.	Amend City of Albany Green Building Standards of Compliance to require 12% increase in energy efficiency at point-of-sale of commercial buildings. Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)
BE-2.4	Identify and facilitate solar energy EmPowerment districts in commercial, industrial, and mixed-use portions of City.	-	-	-	-	$1,316	Possible increase in energy costs assuming higher costs for more renewable energy versus cheaper fossil fuel alternatives.	Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost) Also assumes most businesses will take advantage of PPAs (lease) and will not purchase solar
BE-2.5	Join Bay Area efforts to ensure green public transit energy sourcing.	-	-	-	-	$1,316	N	Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)

Objective BE-3: Require energy performance in new construction

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
BE-3.1	Require new construction to comply with Tier 2 energy efficiency standards contained within section 503.1.2 of the California Green Building Code.	EDAW Seattle Green Building Policy Analysis	-	-	-	$1,316	Possible increased capital costs that could be off set by long-term energy bill savings and increased property value as an energy efficient building.	Monitoring and enforcement cost: Implementation costs to the City are largely dependent on the capacity of the City for policy administration and enforcement. Additional staff training would need to take place to ensure officials fully understand the pedestrian rights laws. Additional hours may also be required in order to conduct enforcement operations. Initial Costs: Cost of training officers about pedestrian rights laws. Annual Costs: Administrative, monitoring, and enforcement cost low to none, depending on availability of existing officers.
BE-3.2	Require that all new multi-tenant buildings be sub-metered to allow each tenant the ability to monitor their own energy and w consumption.	-	-	-	-	$1,316	Possible marginal increased costs to tenants. Possible maginal increae in revenue from savings to property owner.	Initial Costs: Cost of Adopting an Ordinance + Training City Staff to administer program/process applications. Possible additional education and outreach related expenses. Annual Costs: Administrative, monitoring, and enforcement cost low to none, depending on availability of existing staff. Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)

Objective BE-4: Community energy management

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
BE-4.1	Partner with other neighboring cities and PG&E to fast-track smart grid technology in Albany.	-	-	-	-	$1,316	N	California Public Utility Commission agreed to allow PG&E to charge ratepayers for an additional $467 million to bring 10 million gas and electric meters with two-way communications capabilities to its customers by 2011. Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to t CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)
BE-4.2	Work with Alameda County to convert all street lights to LED bulbs or LED-solar systems.	Report by Energy Solutions (Dec. 2008). "LED Street Lighting. Host Site: San Francisco, California." http://apps1.eere.energy.gov/buildings/publicatio ns/pdfs/ssl/gateway_sf-streetlighting.pdf	Assume cost is to County	-	$336,300	$33,629	N	Based on Clinton Climate Foundation calculations, City of Albany, 2010
BE-4.3	Research the feasibility of joining the Community Choice Aggregation efforts of Berkeley, Oakland, Emeryville, and other neighboring cities.	-	-	-	-	$1,316	Possible increase in energy costs assuming higher costs for more renewable energy versus cheaper fossil fuel alternatives.	Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)
BE-4.4	Encourage PG&E and EBMUD to provide comparative energy and water conservation metrics on utility bills.	-	-	-	-	$1,316	N	Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)

Transportation and Land Use Strategy - *Create an interconnected transportation system and land use pattern that shifts travel from auto to walking, biking and public transit*

Objective TL-1: Facilitate walking and biking in the community

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
TL-1.1	Expand and enhance bicycle infrastructure throughout the city.	See below	See below	See below	See below	See below	See below	See below
A	Improve/expand bicycle/pedestrian infrastructure network	Alta Planning, City of Albany, AECOM	$7,900,000	$46,000,000	$26,950,000	$2,695,000	N	Huge variations in cost depending on project needs. Alta Planning cost estimates: Bike Path - $500K - $3M per mile (high end indicates grade-separated crossings every 1-2 miles); Bike Lanes - $25-$50K per mile (could be more if it requires road widening and ROW acquisition); Bike Routes - $5K-$50K per mile (depends on level of treatment - route signage only would be low end, signage + shoulder striping, pavement markings, signal actuation would be higher end). Separated cycle track + street re-design estimated to be $500,000 - $3M per mile.
B	Incorporate bicycle-friendly intersections into street design	City of Portland Bureau of Transportation, AECOM	$88,000	$143,000	$115,500	$11,550	N	$8,000 - $13,000 per box. Assume City will install bike boxes at 11 intersections. $88,000 - $143,000
TL-1.2	Install bicycle racks in commercial and civic areas of City where racks do not currently exist.	Alta Planning, Creative Pipe, SFMTA	$20,000	$20,000	$20,000	$2,000	N	$200 per 2-bike rack ($150 per rack + $50 for installation). Assumes 100 new racks will be needed in the city.
TL-1.3	Evaluate the community's walking infrastructure, identify potential barriers, and implement improvements.	Fehr & Peers	$1,418,250	$2,569,000	$1,993,625	$249,000	N	Source: Fehr and Peers, 2010; http://www.walkinginfo.org/engineering/crossings.cfm
TL-1.4	Strictly enforce pedestrian rights laws on City streets.	EDAW	$20,000	$20,000	$20,000	$20,000	N	Enforcement cost: Implementation costs to the City are largely dependent on the capacity of the police to enforce existing laws with current staff. Additional training would need to take place to ensure officers fully understand the pedestrian rights laws. Additional hours may also be required in order to conduct enforcement operations. Initial Costs: Cost of training officers about pedestrian rights laws. Annual Costs: Administrative, monitoring, and enforcement cost low to none, depending on availability of existing officers.
TL-1.5	Encourage additional neighborhood-serving commercial uses and mixed-use development within the City's existing commercial districts. Strive to provide access to daily goods and services within ¼-mile of residences.	EDAW	$800,000	$800,000	$266,667	$33,333	N	EDAW estimate of consultant fee for General Plan Update: $800,000

Objective TL-2: Make public transit more accessible and user-friendly

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
TL-2.1	Conduct public transit gap study that analyzes strategies for increasing transit use within the City and identifies funding sources for transit improvements.	Nelson Nygaard	$45,000	$55,000	$50,000	$6,250	N	It is assumed this study will require some data collection.
TL-2.2	Work with AC transit to provide bus stops with safe and convenient bicycle and pedestrian access and essential improvements such as shelters, route information, benches, and lighting.	See below	See below	See below	See below	See below	See below	See below
A	Bus stop improvements	City of Bishop 2008 Capital Improvement Plan; City of Albany	$150,000	$150,000	$150,000	$18,750	N	Assumed that City will provide bus shelters, benches and existing street lights will provide lighting. AC Transit will pay for maintenance. Estimated that 5 stops need enhancement + 5 new stops = 10 stops total. $15,000 per transit stop = $150,000
B	Extend Bus Line 18 to commercial retail on Eastshore Highway	EDAW	-	-	-	$1,316	N	Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)
TL-2.3	Provide passes and shuttles to transit to encourage use of alternative transportation by City employees.	City of Berkeley	-	-	$9,000 per year	$9,000	N	City is too small to qualify for the AC Transit EasyPass Program. Assume City will be able to partn with the City of Berkeley to obtain passes for employees. The City of Berkeley pays $91,837 to provide passes to the 1,374 eligible employees ($67/employee). City of Albany has 130 employees. ~$9,000 for passes per year + staff time to coordinate with Berkeley and setup program.

Objective TL-3: Promote pedestrian- and transit-oriented development

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes

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TL-3.1	Provide public education about benefits of well-designed, higher-density housing and relationship between land use and transportation.	EDAW	$300,000	$300,000	$300,000 (for 14 strategies)	$2,679	N	We are assuming many marketing/education-related strategies could be addressed concurrently. EDAW community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume 4 advertising campaigns would take place for the CAP = $300,000 for all 14 strategies
TL-3.2	Update planning documents to promote high-quality, mixed-use, pedestrian- and transit-oriented development in the San Pablo/Solano Avenue commercial districts.	EDAW	$30,000	$30,000	$30,000	$3,750	N	Consultant fee estimate: $30,000
TL-3.3	Evaluate GHG emissions associated with development proposals and work with applicants to reduce emissions during project review, and incentivize projects that generate low levels of GHG emissions.	EDAW	-	-	-	$1,316	N	Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)
A	Prescriptive Approach - strategy based on compliance with standard; GHG emissions are estimated based on typical building performance (GHG/sf) for specified design strategies	Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis	$145,000	$350,000	$247,500	$30,938	Y	Prescriptive approach: Commercial: LEED NC 2.2 EA Credit 1: Optimize Energy Performance Prescriptive Compliance Option, Residential - ENERGY STAR for Homes (Home Performance tod or Earth Advantage Energy Performance Certificate. Initial Costs: Assessment of required upgrades: $75,000 - $150,000. Although sample checklists from other jurisdictions are available, assessing and establishing what upgrades are needed in each sector to meet city-wide energy efficiency goals, while also assessing the cost-effectiveness of those measures, is likely to be a significant task. -Development of a database: $20,000-$100,000. A database would be needed to track what properties are in compliance with the mandate. Alternatively, existing databases could potentially be leveraged for cost savings. -Legislative Development: $50,000 - $100,000. City staff and legal council would need to develop the policy specifics and legislation. Much of this work could be done within existing staffing levels, meaning few to moderate new resources would be needed.
B	Performance Based Approach	Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis	$225,000	$500,000	$362,500	$45,313	Y	Performance based approach: energy modeling ordinance (possibly tied to LEED NC 2.2 EA Credit 1: Optimize Energy Performance + EA Credit 5: Measurement and Verification) or equivalent for LEED Homes. Possible synergy with expedited permitting/fast tracking policy strategies. Initial Costs: Assessment of existing rating systems: $75,000 - $200,000. Experience to date has indicated that existing rating systems must be vetted in the marketplace before making them mandatory. In addition to selecting a rating system, the City would need to assess and select appropriate performance requirements. -Development of database: $100,000 - $200,000. A database could be developed to house and provide ability for property owners or City program managers to access the ratings. Alternatively, existing databases (such as the Multiple Listing Service or EPA's Portfolio Manager) could potentia be leveraged for residential and commercial ratings, respectively. -Legislative Development: $50,000 - $100,000. City staff and legal council would need to develop the policy specifics and legislation. Much of this work could be done within existing staffing levels, meaning few to moderate new resources would be needed.
C	Develop GHG Reduction Development Impact Fee based on a clear nexus of new development's negative contribution to increases in GHG. Performance based development impact fee.	EDAW	$70,000	$100,000	$85,000	$8,000	N - Possible costs to local developers	Cost would be to develop the nexus study to determine the relationship between new development and its negative contribution to GHG. The study would require 5-year updates for an accounting of mitigation measures paid through the impact fee.

Objective TL-4: Reduce vehicle emissions and trips

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
TL-4.1	Work with ABAG and neighboring cities to improve the jobs-housing balance within the City and regional transit corridors.	-	-	-	-	$1,316	N	Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)
TL-4.2	Improve fuel efficiency of the City vehicle fleet by purchasing low- or zero-emission vehicles when vehicles are retired from service.	City of Albany	-	-	$728,000	$72,800	N	Estimated cost per hybrid vehicle: $26,000. City has 28 vehicles
TL-4.3	Incentivize electric and plug-in hybrid vehicles through development of automobile charging infrastructure and preferential street parking spaces.	See below	See below	See below	See below	See below	See below	See below
A	Charging station infrastructure	-	-	-	-	$1,316	N	If City partners with Better Place or Coulomb Technology, this infrastructure could have no additional cost to the City. Some cities (SF, Oakland, San Jose) are offering incentives to promote electric vehicles, such as expedited permitting and installation of electric vehicle charging outlets. Cost assumes private company will install infrastructure. Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)
B	Preferential street parking for electric and plug-in electric hybrid vehicles	-	-	-	-	-	N	Low cost. Loss of revenue associated with reduced parking fees
TL-4.4	Create and implement a voluntary transportation demand management (TDM) program to reduce weekday peak period single occupancy commute and school trips.	Nelson Nygaard	$25,000	$75,000	$50,000	$6,250	N	Comprehensive TDM study tailored to local conditions (including some data collection as needed): $75,000. Basic TDM study: $25,000
A	Facilitate ride-share programs.	-	-	-	-	$1,316	N	Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)
B	Public outreach	EDAW	$300,000	$300,000	$300,000 (for 14 strategies)	$2,679	N	Assume many marketing/education-related strategies could be addressed concurrently. EDAW community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume 4 advertising campaigns would take place for the CAP = $300,000 for all 14 strategies
TL-4.5	Evaluate and consider implementation of community parking management strategies.	EDAW	$45,000	$55,000	$50,000	$6,250	N	It is assumed this study will require some data collection.

Objective TL-5: Prepare for peak oil

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
TL-5.1	Conduct a study of the potential effects of peak oil on the community and develop a peak oil adaptation plan.	-	-	-	-	$1,316	N	Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)

Waste Reduction Strategy - *Minimize waste*

Objective WR1: Become a zero-waste community

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
WR-1.1	Establish a citywide zero waste target for 2030.	-	-	-	-	$1,316	N	Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)

Water Conservation Strategy - *Celebrate water as an essential community resource*

Objective WC-1: Conserve water in existing buildings/landscapes

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
WC-1.1	Encourage residential and commercial users to participate in EBMUD's free water audit program.	EDAW	$300,000	$300,000	$300,000 (for 14 strategies)	$2,679	N	Assume many marketing/education-related strategies could be addressed concurrently. EDAW community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume 4 advertising campaigns would take place for the CAP = $300,000 for all 14 strategies
WC-1.2	Encourage 50% reduction in outdoor potable water usage for existing residential and commercial properties.	-	-	$300,000	$300,000 (for 14 strategies)	$2,679	N	Assume many marketing/education-related strategies could be addressed concurrently. EDAW community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume 4 advertising campaigns would take place for the CAP = $300,000 for all 14 strategies

Objective WC-2: Conserve water in new construction/landscapes

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
WC-2.1	Require new construction and major remodels to achieve indoor water efficiency 20% above the California Building Standards Code.	-	-	-	-	$1,316	Possible increased capital costs that could be off set by long-term water bill savings and increased property value as an water efficient building.	Amend City of Albany Green Building Standards of Compliance to require residential remodels and renovations improve plumbing fixture and fixture-fitting water efficiency by 20% above the California Building Standards Code water efficiency standards. Initial Costs: Cost of Adopting an Ordinance + Training City Staff to administer program/process applications. Possible additional education and outreach related expenses. Annual Costs: Administrative, monitoring, and enforcement cost low to none, depending on availability of existing staff. Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)
WC-2.2	Require new landscape projects to reduce outdoor potable water use by 50%.			See Measure WC-2.1	See Measure WC-2.1	See Measure WC-2.1	See Measure WC-2.1	See Measure WC-2.1

Green Infrastructure Strategy - Conserve, create, and enhance natural assets that improve community quality of life.

Objective GI-1: Expand and enhance urban forestry

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
GI-1.1	Enhance the community's urban forest and other landscapes to maximize carbon sequestration, reduce stormwater runoff, and augment neighborhood aesthetics.	See below	See below	See below	See below	See below	See below	See below
A	Tree planting	City of Albany	-	-	$200,000	$20,000	N	Urban Forest Department stated that the City would approach planting capacity in approx. 10 years with an additional 5,000 trees. Estimated that this would require an additional $20,000 per year to purchase/plant trees/expand urban forest program.
B	Undergrounding utilities	-	-	-	-	$1,316	N	Assume City will hire one green building/sustainability professional at ($80K + benefits/overhead = $200,000) who will be responsible for implementing all strategies related to the CAP. ($200,000 / 19 strategies / 8 years = $1,316 avg annual cost)

Food and Agriculture Strategy - Create a sustainable and climate-friendly food system.

Objective FA-1: Strengthen the regional food system

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
FA-1.1	Establish a permanent farmer's market site within the City and work to expand the market as a community resource.	-	-	-	-	$20,000	N	Assumes farmer market site study and consultation with local farmers markets organizations.
FA-1.2	Facilitate and promote Community-Supported Agriculture organizations and services.	EDAW	$300,000	$300,000	$300,000 (for 14 strategies)	$2,679	N	Assume many marketing/education-related strategies could be addressed concurrently. EDAW community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume 4 advertising campaigns would take place for the CAP = $300,000 for all 14 strategies
FA-1.3	Procure regionally produced food for City events and encourage vendors at City-sponsored events to procure food regionally.	EDAW	$300,000	$300,000	$300,000 (for 14 strategies)	$2,679	N	Assume many marketing/education-related strategies could be addressed concurrently. EDAW community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume 4 advertising campaigns would take place for the CAP = $300,000 for all 14 strategies

Objective FA-2: Promote awareness of sustainable food choices

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
FA-2.1	Encourage low-carbon meals through public education.	EDAW	$300,000	$300,000	$300,000 (for 14 strategies)	$2,679	N	Assume many marketing/education-related strategies could be addressed concurrently. EDAW community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume 4 advertising campaigns would take place for the CAP = $300,000 for all 14 strategies

Objective FA-3: Increase and enhance urban agriculture

Measure		Data Source	Low Cost	High Cost	Average Cost	Avg Annual Cost (assume 2012 start date for most activities)	Direct Costs to Local Residents and Businesses	Cost Notes
FA-3.1	Establish a local community garden program to increase local food security and provide local recreation amenities.	Urban Harvest	$2,600	$20,000	$11,300	$1,413	N	Assuming land is dedicated, new garden could be built for $1,000 - $4,000 + annual maintenance costs with volunteer labor. Potential additional cost higher depending on on-site facilities (assumed $20,000)

Legend for Origin of Policies:

ACGT	Albany Clean and Green Task Force
CAP SRV	CAP Online Survey
ASR	Albany Strollers and Rollers
BMP	Best Management Practices
AG	Attorney General
CAPCOA	2007 CAPCOA Report

Appendix D.

Outreach Materials

SUSTAINABILITY COMMITTEE
REGULAR MEETING
MINUTES

City of Albany Community Development Department
Large Conference Room
979 San Pablo Avenue, Albany
September 17, 2008 – 7:30 p.m.

1. CALL TO ORDER

The meeting was called to order at 7:35 p.m.

2. ROLL CALL

Members Present:

Thomas Cooper	Caryl O'Keefe
Miya Kitahara	Janet Smith-Heimer
Dan Lieberman	April Yang

Members Absent: Suzanne Schrift
Staff Present: Nicole Almaguer
Others Present: EDAW

3. APPROVAL OF MINUTES

3-1. Approve minutes from July 16 meeting (attached)

Minutes approved unanimously, motion by O'Keefe, seconded by Lieberman.

4. PUBLIC COMMENT

Francesco Papalia: expressed interest in pursuing wind turbine at the bulb.

5. ANNOUNCEMENTS/COMMUNICATIONS

None.

6. PRESENTATION

6-1. Climate Action Plan (CAP) Project Kick-off Meeting with EDAW, Inc. (Attachment 1)

EDAW, Inc. provided a presentation regarding the CAP. EDAW identified the City's current baseline greenhouse gas emissions, key areas of a CAP, and the public planning process that would be taken to develop the CAP.

The Clean and Green Task Force Recommendations were discussed, and the Committee suggested new measures to consider within the CAP.

EDAW will be developing a survey for the public within the next couple of weeks. The survey will be widely promoted to encourage participation. EDAW will return to the Committee in December with survey results and to discuss greenhouse gas reduction measures identified within the survey results.

Public Comment:

Nick Pilch, Strollers & Rollers: encourages the CAP be connected to the City's Bicycle Master Plan, and promotes completion of a Pedestrian Master Plan. Supports transportation safety education. Strollers & Rollers is interested in working with the Committee.

7. REPORTS

7-1. Long Range Planning/Sustainable Development Subcommittee – update

The subcommittee is researching the potential for wind energy at the Albany bulb. The subcommittee has also drafted a project review policy for review by the Committee.

7-2. Urban Landscape Subcommittee – update

O'Keefe reported that the subcommittee sent in a list of questions to the Public Works Manager regarding the City's maintenance practices. Maintenance practices all seem to be quite environmentally friendly.

7-3. Education Subcommittee – update

The subcommittee discussed the AHS connect program.

7-4. Green Albany Event & Green Corridor Update (Almaguer)

Almaguer reported that both items will be going to City Council for review within the month of October.

8. DISCUSSIONS AND POSSIBLE ACTION ON MATTERS RELATED TO THE FOLLOWING ITEMS:

8-1. Education Subcommittee Recommendation: Albany High School "Connect" Program – determine

Committee's interest in this program and compile a list of potential projects (Kitahara – Attachment 2)

Kitahara provided an introduction to this item. AHS Connect program is a newly created program by the high school to encourage students to get involved in the community. Kitahara asked if the Committee had any ideas for potential projects for students, and if the Committee was in favor of supporting the program.

The Committee identified a number of potential projects for students.

Cooper motioned the Committee become a community partner to the AHS Connect program, seconded by Smith-Heimer, unanimously approved.

8-2. Long Range Planning Subcommittee Recommendation: "Project Review Policy" (Smith-Heimer – Attachment 3)

Smith-Heimer provided an introduction to this item. It is intended to provide guidelines in terms of what the Committee's focus will be for reviewing projects. The Committee agreed to discuss this item in more detail at the October meeting. The subcommittee will try to meet with Jeff Bond, the City's Planning Manager, prior to the next meeting.

9. FUTURE AGENDA ITEMS

(Commission/Committee/Board Member announcement of requests for future agenda items. No public comment will be taken on announcement of future agenda items).

9-1. Next meeting October 15, 2008 – Fern Tiger Associates Waterfront Planning (Attachment 4)

ADJOURNMENT

The meeting was adjourned at 9:50 pm.

SUSTAINABILITY COMMITTEE
REGULAR MEETING
Minutes

City of Albany Community Development Department
Large Conference Room
979 San Pablo Avenue, Albany
December 17, 2008 – 7:30 p.m.

1. CALL TO ORDER

2. ROLL CALL

Thomas Cooper Dan Lieberman
Miya Kitahara
Caryl O'Keefe

Members Absent: Janet Smith-Heimer, Suzanne Schrift, April Yang
Staff Present: Nicole Almaguer
Others Present: Beth Pollard, City Administrator, EDAW, INC.

3. APPROVAL OF MINUTES

3-1. Approve minutes from November 19 meeting (attached)

Minutes approved unanimously, motion by O'Keefe, second by Kitahara.

4. PUBLIC COMMENT

None.

5. ANNOUNCEMENTS/COMMUNICATIONS

Cooper announced he and Lieberman will be meeting with Council Member Wile regarding an upcoming meeting she will be attending with Barbara Lee to discuss sustainability opportunities and projects for the city in preparation for federal funding.

6. PRESENTATION

6-1. Albany Climate Action Plan Update – EDAW, Inc.

EDAW, INC provided a presentation regarding the climate action survey. To date 100 responses to the survey have been received. Input from both seniors and youth are still needed.
The survey will be further promoted within the community, and public workshops will be held at the Green Albany Day event in May.
Amy Smolens, representing Albany Strollers & Rollers expressed interest in pursuing the City's Pedestrian Plan and updating the Bicycle Master Plan. Strollers & Rollers would like to coordinate and work collaboratively on the Climate Action Plan.

7. REPORTS

7-1. Long Range Planning/Sustainable Development Subcommittee – update

Cooper provided an update, including reading an email provided by Smith-Heimer. The subcommittee continues to research the possibility of placing an anemometer on the bulb, and have been trying to inquire with PG&E. The item will also be brought up with Barbara Lee. Lieberman also noted that PG&E may receive the credits associated with the wind energy project, and it would be important that the City receive some sort of percent of the credit.
Almaguer asked what installation of an anemometer entailed. Lieberman replied that it is a 150-foot pole, which would be up for approximately one year.
Almaguer recommended this item be discussed with the Waterfront Committee to gauge interest.
Cooper agreed and noted that the subcommittee determined that more dialogue with the Waterfront Committee is necessary on this item as well as on development issues in general.
Cooper asked what the typical procedure is for corresponding with another Committee.
Almaguer suggested representatives from the Committee visit the Waterfront Committee to present and discuss the idea.
Cooper asked how the Committee could learn about what the Waterfront Committee is pursuing, and when it is related to sustainability.
O'Keefe suggested reviewing the minutes, watching the meetings on television, or contacting them directly to discuss overarching areas of interest.

Cooper reported the subcommittee also discussed the Fern Tiger presentation.

7-2. Urban Landscape Subcommittee – update

O'Keefe noted that she received a proposal regarding urban farming, and would like to allow for a presentation on this subject at a future meeting. They are also researching the amount of water conservation at Golden Gate Fields, and would like to recognize them for conservation.

7-3. Education Subcommittee – update

Kitahara reported they are working on Green Albany Day, and are developing criteria for how vendors and participants are allowed to host a table at the event. Additionally they are working on a survey that would be sent community wide.

7-4. Green Albany Day - update

This item was discusses as part of 7-3.

8. DISCUSSIONS AND POSSIBLE ACTION ON MATTERS RELATED TO THE FOLLOWING ITEMS:

8-1. Long Range Planning Subcommittee Recommendation: "Project Review Policy" (Smith-Heimer)

Smith-Heimer will present a revised draft policy at the next meeting.

8-2. Sustainable Food Policy – Review and provide comments (Kitahara)

Kitahara asked for additional comments from the Committee, and plans to make the policy a purchasing policy, taking out the land use portion within the policy. The resolution will include charging the Committee with conducting a land use study.

8-3. Reorganizing the Social and Economic Justice Commission and Sustainability Committee into one commission

City Administrator Beth Pollard provided background on this item, and noted that the reasoning behind this recommendation is to do some economizing of staff capacity, and that the Social and Economic Justice Commission (SEJC) has not been that active recently. Additionally, social and economic justice has a connection to sustainability. City Council would like input from the two bodies. The item will be taken back to City Council in January or February.

O'Keefe stated she sees advantages to combining the groups, and feels economics should be considered within sustainability. She attended some of the SEJC meetings, a quorum was not met at two recent meetings.

Kitahara expressed concern over the potential size of the new body, and feels that SEJC issues would require additional people.

Lieberman suggested SEJC act as an ad-hoc group that met as issues were identified. The Sustainability Committee is currently comprised of professionals in the environmental field, and increasing the scope of this group could have a negative impact on the Committee.

Cooper agreed the Committee should keep social and economic justice issues in mind when considering items. The Committee has a very full plate, and addition of SEJC items could create distraction and overwhelm the group. Cooper also expressed concern regarding the potential size of the body.

The Committee agreed to discuss this item further at the January meeting.

9. FUTURE AGENDA ITEMS

9-1. Next meeting January 21, 2008 – Green Building Ordinance & Implementation, Site Drainage Update (Planning Staff)

10. ADJOURNMENT

The meeting was adjourned at 10:00 p.m.

SUSTAINABILITY COMMITTEE
REGULAR MEETING
DRAFT MINUTES

City of Albany Community Development Department
Large Conference Room
979 San Pablo Avenue, Albany
March 18, 2009 – 7:30 p.m.

1. CALL TO ORDER

The meeting was called to order by Chair Cooper at 7:40 p.m.

2. ROLL CALL

Thomas Cooper	Caryl O'Keefe	Janet Smith-Heimer
Miya Kitahara	Suzanne Schrift	April Yang
Dan Lieberman		

Staff Present: Nicole Almaguer
Others Present: EDAW, Inc.

3. APPROVAL OF MINUTES

3-1. Approve minutes from February 18 meeting (attached)

Minutes approved unanimously, motion by O'Keefe, seconded by Schrift.

4. PUBLIC COMMENT

None.

5. ANNOUNCEMENTS/COMMUNICATIONS

Almaguer announced the city will be participating in the "Renewable Funding" program, allowing cities and counties to join a statewide clean energy financing program. The first workshop is scheduled for the end of April.
Schrift announced that the Richmond Plunge is a current example of how a pool can be built with sustainable practices.

6. PRESENTATION

6-1. Climate Action Plan Draft Greenhouse Gas Emissions Reduction Strategies (EDAW, Inc.)

EDAW, Inc. provided an overview of the current planning process and the draft greenhouse gas emissions reduction strategies. A number of strategies were presented including transportation/land use, buildings/energy, waste and water, green infrastructure, sea level rise, and economic development.
Smith-Heimer requested detail on EDAW's peer review of the ICLEI baseline inventory.
Cooper requested a focused meeting to review the draft measures, and requested EDAW provide cost estimations and time considerations for implementation of each measure.
EDAW will provide the updated information the week prior to the Committee's meeting in order to have time for review. A meeting will also be held with city staff to review the draft measures.
The Committee agreed two hours of the next regular meeting would be dedicated to review of the draft measures.

7. REPORTS

7-1. Long Range Planning/Sustainable Development Subcommittee – update

Smith-Heimer provided an update. The subcommittee spoke with Dan Kammen at UC Berkeley regarding the potential for wind energy at the waterfront. Kammen provided some suggestions that the subcommittee will research further. The subcommittee would like to research funding opportunities to conduct a feasibility study. The subcommittee also discussed developing an ordinance requiring solar hot water for pools. Lieberman will follow up with Planning Manager Bond regarding this item.
Smith-Heimer provided a draft process for the Committee's input to major projects and programs. The process allows for liasions to the Waterfront Committee, Park & Recreation Commission and the Planning and Zoning Commission to encourage interaction between the Committee and these groups on major projects and programs. This item will be put on the April agenda for approval by the Committee.

7-2. Urban Landscape Subcommittee – update

Schrift provided an update. The subcommittee is researching examples of stormwater design educational materials that could be provided at the planning counter. Schrift will also be discussing the item further with planning staff to identify how stormwater design can be further encouraged in development projects. The subcommittee also provided a summary of items within the urban farming proposal that they would like to pursue. This item will be on the May agenda for discussion/action.

7-3. Education Subcommittee – update

The Education Subcommittee update is included within item 8-1.

8. DISCUSSIONS AND POSSIBLE ACTION ON MATTERS RELATED TO THE FOLLOWING ITEMS:

8-1. Green Albany Day Event Planning

Kitahara provided an update. Over 160 surveys were received from the community, resulting in a number of volunteers to assist with the event. Workshop topics have been identified based on preferences selected on the surveys. Workshop providers are now being confirmed, and posters are being developed by a high school student for the event. Further discussion of Green Albany Day will continue at the April Committee meeting.

Amy Smolens, Strollers and Rollers reported Jelly Belly offered to sponsor the bike valet for the event. Jelly Belly will be included as a sponsor on printed material for the event.

8-2. Environmentally Preferable Purchasing Policy /Food Policy – Review draft (Kitahara)

Kitahara provided an overview of the updated purchasing policy and the resolution.

The item was approved unanimously, motion by Smith-Heimer, seconded by Cooper. The policy and resolution will be taken to City Council for approval.

9. FUTURE AGENDA ITEMS

9-1. Next meeting April 15, 2009 – EDAW – draft CAP measures

The April agenda will also include review of the Long-range planning subcommittee recommended process for input to major projects and programs, and Green Albany Day. The urban landscape subcommittee will prepare recommendations on projects related to the Green Albany urban farming proposal at the May meeting.

10. ADJOURNMENT

The meeting was adjourned at 10 p.m.

The Committee packet is available for public inspection at the Albany Library, Fire Department and City Hall. The agenda and supporting staff reports, if available, can be found on our web page at www.albanyca.org.

Please note that if you provide your name and address when speaking before the Committee it will become part of the official public record, which will be posted on the Internet. Agenda related writings or documents provided to a majority of the Sustainability Committee regarding any item on this agenda will be made available for public inspection in the Community Development Department, 979 San Pablo Avenue, Albany CA.

SUSTAINABILITY COMMITTEE
REGULAR MEETING
MINUTES

REVISED MEETING LOCATION:
VETERAN'S MEMORIAL BUILDING
1325 PORTLAND AVE – (MEMORIAL PARK)
April 15, 2009 – 7:00 p.m.

1. CALL TO ORDER

The meeting was called to order by Chair Cooper at 7:05 p.m.

2. ROLL CALL

Thomas Cooper	Caryl O'Keefe	Janet Smith-Heimer
Miya Kitahara	Suzanne Schrift	April Yang

Members Absent: Dan Lieberman
Staff Present: Nicole Almaguer
Others Present: EDAW, Inc.

3. APPROVAL OF MINUTES

3-1. Approve minutes from March 18 meeting (attached)

Minutes approved unanimously as amended. Motion by Kitahara, seconded by O'Keefe.

4. PUBLIC COMMENT

Preston Jordan announced that Buchanan Street is being considered for redesign, and a public meeting is scheduled. Jordan has been encouraging the concept of complete streets.

5. ANNOUNCEMENTS/COMMUNICATIONS

Preston Jordan announced that Transform's annual summit will be held on 5/16.
Ed Fields announced the UC educational series in process regarding SB 375.

6. DISCUSSIONS AND POSSIBLE ACTION ON MATTERS RELATED TO THE FOLLOWING ITEMS:

6-1. Process for Sustainability Committee Input to Major Projects and Programs – Review proposal from long range planning subcommittee

Smith-Heimer presented the proposal to create liaisons to Traffic & Safety, Planning & Zoning, and the Waterfront Committee. This will provide an opportunity for the Committee to introduce itself and to identify mutual goals between various groups. Designees from the Committee may not be able to attend each meeting, but will monitor agendas and minutes. If designees are unable to attend, other members from the Committee would be encouraged to attend if the agenda seemed relative.
O'Keefe suggested including additional city commissions, and encouraged regular attendance at the meetings.
O'Keefe regularly attends the Waterfront Committee meetings, and they recently had a discussion about the Albany Bulb as related to Measure WW funds. They discussed transfer of the Bulb to the Park District, and a member of the public stated that wind energy at the waterfront was being discussed by the Sustainability Committee. This is an example of how the agenda does not always reflect what will be discussed and why regular attendance should be attempted.
Jordan asked why the other city groups and the school board were not included.
Smith-Heimer replied that the Committee is aiming to start with key groups, expanding as schedules allow, and potentially involve the schools in the future.

Cooper noted the amendment to the policy to attempt inclusion of other city commissions as schedule allows.
Policy unanimously approved as amended.

6-2. Continued review of Climate Action Plan Draft Greenhouse Gas Emissions Reduction Strategies

EDAW provided a number of measures for discussion based on measures that quantitatively seem to be those that are the most feasible, provide the biggest ghg reductions, and are affordable.
Smith-Heimer requested additional data related to the peer review of the ICLEI inventory.
Smith-Heimer also requested that EDAW develop measures unique to Albany, and that Albany already has density.
Kitahara requested EDAW provide detail on how the estimated greenhouse gas emissions reductions were calculated.

Jordan provided comments from the Carbon Neutral Albany group, and requested additional information regarding cost detail.
EDAW will be revising the draft measures and supplying additional information as requested.

6-3. Green Albany Day Event Planning
The event is well planned and a number of organizations will have information booths at the event. Public outreach, posters, and media will be conducted to encourage attendance.
6-4. Select liaison for AUSD Pool Sustainability Committee
This item was not discussed.

7. FUTURE AGENDA ITEMS
(Commission/Committee/Board Member announcement of requests for future agenda items. No public comment will be taken on announcement of future agenda items).
7-1. Next meeting May 20, 2009

8. ADJOURNMENT
The meeting was adjourned at 10:45 p.m.

The Committee packet is available for public inspection at the Albany Library, Fire Department and City Hall. The agenda and supporting staff reports, if available, can be found on our web page at www.albanyca.org.
Please note that if you provide your name and address when speaking before the Committee it will become part of the official public record, which will be posted on the Internet. Agenda related writings or documents provided to a majority of the Sustainability Committee regarding any item on this agenda will be made available for public inspection in the Community Development Department, 979 San Pablo Avenue, Albany CA.

SUSTAINABILITY COMMITTEE
REGULAR MEETING
DRAFT MINUTES

City of Albany Community Development Department
Large Conference Room
979 San Pablo Avenue, Albany
June 17, 2009 – 7:30 p.m.

1. CALL TO ORDER

The meeting was called to order by Chair Cooper at 7:35 p.m.

2. ROLL CALL

Thomas Cooper	Caryl O'Keefe	Dan Lieberman
Miya Kitahara	Suzanne Schrift	April Yang

Members Absent: Janet Smith-Heimer
Staff Present: Nicole Almaguer, Ann Chaney

3. APPROVAL OF MINUTES

3-1. Approve minutes from April 15 meeting (attached)

Minutes approved as amended – motion by O'Keefe, seconded by Schrift.

4. PUBLIC COMMENT

Mari Gilmore – interested in connecting El Cerrito's Environmental Quality Committee with the Sustainability Committee.
Kitahara announced International day of climate action is scheduled for October 24. Visit 350.org for more information.
Chaney announced that the Voices to Visions waterfront visioning sessions have been extended, and encouraged Committee members to promote the visioning sessions.

5. ANNOUNCEMENTS/COMMUNICATIONS

5-1. Update regarding City participation in the Stopwaste.org "Green Packages" program, energy efficiency stimulus funding, and regional energy efficiency/solar financing opportunities – Attachment 1

Almaguer provided a summary of the various energy programs and financing opportunities the city is engaging in.
Cooper and Lieberman asked about the Green Packages program, and what the benefits were for Albany.
Almaguer noted the deliverables that will be provided by the program, and that the program will enable the county to be competitive for additional funding opportunities to further expand the concepts outlined in the program. Almaguer will provide updates as available.

5-2. Update regarding Climate Action Plan – Attachment 2

Almaguer provided a status update regarding the CAP. EDAW will provide an administrative draft in late June for review by the Committee. The Committee will review and comment on the draft administrative CAP at both the July and September meetings. Per EDAW's summary of Green Albany Day, the CAP public workshops were not well attended.
Cooper expressed concern regarding the limited public input at Green Albany Day, and asked about other opportunities to gain additional public input.
O'Keefe noted that the public workshops at Green Albany Day were publicized.
Almaguer suggested additional public input be sought at upcoming events such as the 4th of July or the Solano Stroll, with a preference for the 4th of July as it involves more local residents. Additionally, a citywide survey can be developed to gain additional input during the draft CAP stage.
The measures outlined in the CAP will all need to go through their own review process prior to being implemented, which will allow for public review of detailed project descriptions as projects/programs are developed.
The Committee agreed a survey would be worthwhile.

6. PRESENTATION

6-1. Albany Waterfront Park Status & Wind Energy Concept (Ann Chaney)

Chaney provided background information regarding the waterfront. The bulb is currently owned by the City. Transfer of the bulb to be included as part of the Eastshore State Park has been intended for several years. The City's Waterfront Committee is preparing a recommendation for City Council to encourage the State to take action and purchase the bulb property.

Chaney also gave a summary of the Measure WW funding available for park acquisition and recreation enhancements. There is $771,000 available as a local non-competitive grant to the City, $27 million for Eastshore State Park, and $12.3 million for Bay trail expansion. The City Council asked the Park & Recreation Commission to identify projects for the $771,000, and asked the Waterfront Committee to identify projects at the waterfront for grant funding. The item will go to the City Council in September.

Chaney raised questions regarding the wind energy concept including habitat concerns, threat to birds/other animals, impact on recreation, impacts on closed landfill soil, amount of energy that could be produced, and energy recipient.

Lieberman replied that the majority of these questions are all questions that would need to be answered as part of a feasibility study.

Liberman and Cooper expressed concern that if the bulb property is purchased by the State there may not be an opportunity to identify the feasibility of introducing wind energy.

Chaney suggested the Committee submit a letter to the City Council regarding the wind energy concept and attend the September meeting.

Liberman will draft a letter for Committee review at the July meeting.

7. REPORTS

7-1. Long Range Planning/Sustainable Development Subcommittee – update

a. Liaison meetings

Cooper provided an update – the Subcommittee attended Waterfront Committee, Planning & Zoning Commission, and Transportation & Safety Commission. Planning & Zoning were interested in the liaison opportunity and suggested a potential subcommittee meeting of P&Z/Sustainability Committee representatives.

Lieberman attended the Traffic & Safety Commission meeting and found that Albany Strollers & Rollers actively attends the meetings and provides good input. Lieberman will review agendas to see when items of interest may come up.

Cooper attended the Waterfront Committee meeting and brought up the example of the wind energy project as a potential project of mutual interest.

The Subcommittee is also interested in having a representative of the Committee attend the School Board meetings. Yang offered to attend the School Board meetings. Cooper noted he would provide assistance to Yang.

7-2. Urban Landscape Subcommittee – update

Schrift provided an update – and suggested postponing the Green Albany proposal as the author was unable to attend the meeting. O'Keefe agreed it would be important to have the author attend the meeting and provide a brief presentation regarding her ideas. The Committee agreed to postpone the meeting until September.

7-3. Education Subcommittee – update

Kitahara stated the Subcommittee has not met since Green Albany Day.

8. DISCUSSIONS AND POSSIBLE ACTION ON MATTERS RELATED TO THE FOLLOWING ITEMS:

8-1. Green Albany Day – review 2009 event and determine if Committee supports an event in 2010

Kitahara provided a report and distributed a summary provided by the staff working on Green Albany day.

O'Keefe stated she would like to find a way to reach out to others that do not typically attend green events.

Schrift agreed.

Cooper stated that some of the outreach plans were not conducted, and that the poster print was small.

Lieberman asked if it was possible to combine it with another city event.

Kitahara stated that the Ecofest in Fairfax is an example of a combined event.

The Committee agreed to pursue combining the event with the Art & Music Festival.

Almaguer will discuss the item with the staff liaison for the Arts Committee to identify their interest in combining the events.

8-2. Urban Landscape Subcommittee – Green Albany Proposal – Attachment 3 (Schrift)

The Committee agreed to postpone this item until September.

8-3. Attendance at an upcoming City of El Cerrito Environmental Quality Committee meeting

Kitahara and Lieberman will attend an upcoming meeting.

Almaguer noted there was also an interest in potentially having a joint meeting in the future.

8-4. Public events – determine if Committee would like to have a booth at the 4th of July Festival and/or Solano Stroll event

4th of July: Almaguer noted that the event runs from 11-4pm, and that the table will include poster boards to obtain input on the climate action plan. Almaguer will email a sign up list to the Committee.

Solano Stroll: O'Keefe recommended the Committee not have a table as it is a busy event, with many not local residents. The Committee agreed not to have a table at the Stroll.

9. FUTURE AGENDA ITEMS

(Commission/Committee/Board Member announcement of requests for future agenda items. No public comment will be taken on announcement of future agenda items).

9-1. Next meeting July 15, 2009 – Comments on Draft Administrative CAP (EDAW, Inc.)
Presentation by P&Z Commission Members – Green Building Standards

10. ADJOURNMENT

The meeting was adjourned at 9:40p.m.

Climate Change: How can Albany be part of the solution?

City of Albany

Climate Action Plan

What does climate action mean for Albany?

Challenges

- Albany will need to:
  - Reduce greenhouse gas (GHG) emissions to stabilize climate change
  - Adapt to the unavoidable effects of climate change
  - Reduce fossil fuel use, change transportation choices, retrofit buildings



Opportunities

- GHG reduction strategies provide many co-benefits:
  - Improve air quality
  - Lower energy bills
  - Reduce fossil fuel reliance
  - Decrease traffic congestion
  - Improve pedestrian network
  - Improve public health



Why it matters locally – climate disruption

- If GHG emissions are not reduced globally, the effects of climate change on Albany are likely to be:
  - Worse air quality and an increase in the number of smoggy days
  - A 30% to 90% decrease in water supply
  - Increased number of heat waves
  - Up to 2.5 times more critical dry years
  - Increased wildfires
  - Spreading of climate-sensitive diseases
  - Loss of habitat for sensitive species
  - Up to 30% higher energy use
  - Sea level rise inundation of shoreline areas

Increase in number of smoggy days

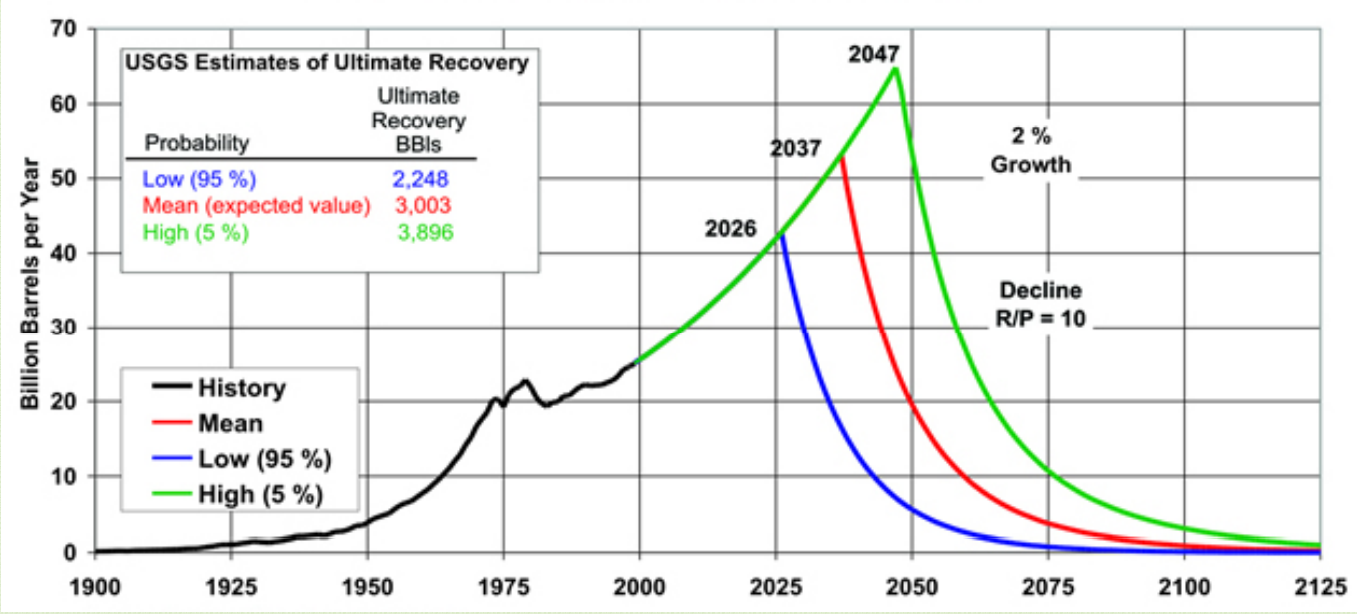
Decrease in water supply

Increase in Wildfires

Why it matters locally – energy security

- Implementing the Climate Action Plan will reduce GHG emissions
- It can also reduce Albany's reliance on fossil fuels and exposure to unpredictable energy prices/supplies

Annual Oil Production Scenarios with 2% Growth



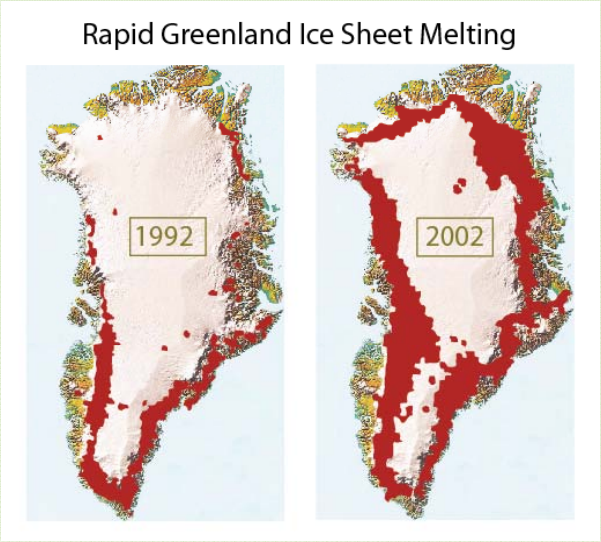
Source: US Department of Energy – Energy Information Administration 2000 – Based on US Geological Survey (USGS) Data

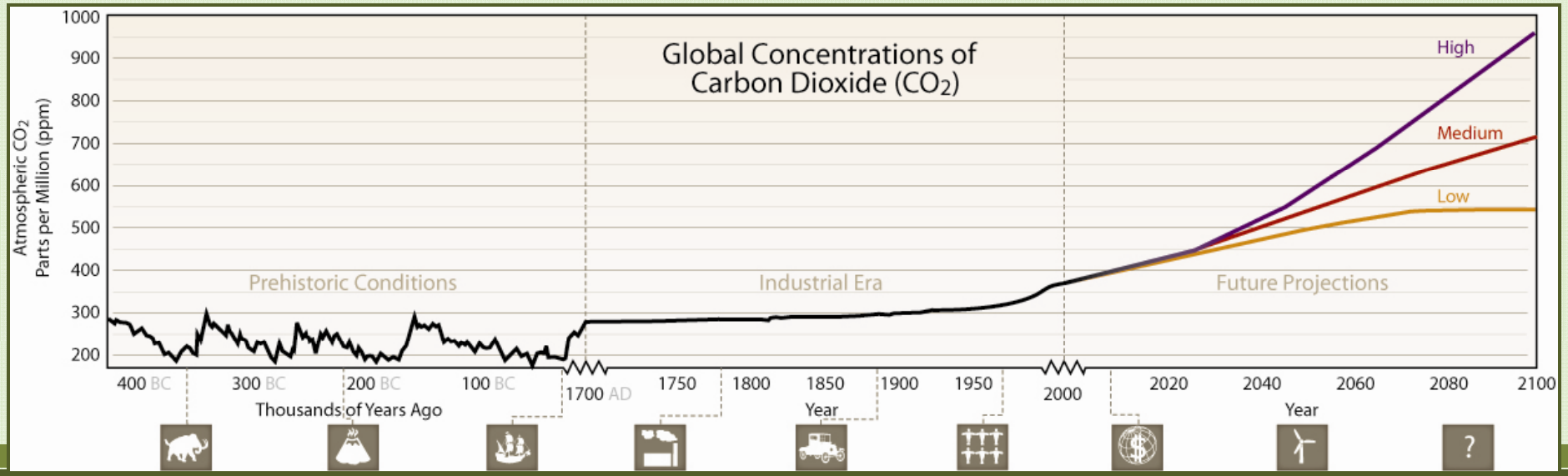
Why it matters globally

Indicators – Destabilization of Climate

- Rising temperatures
- Melting snow caps
- Sea level rise
- Extreme weather events
- Acidification of oceans (loss of coral reefs)

Global GHG emissions need to be reduced to avoid economic, ecological and political instability





California's plan to combat GHG emissions

Timeline of State Legislation

Assembly Bill 32 - ***August 2006***

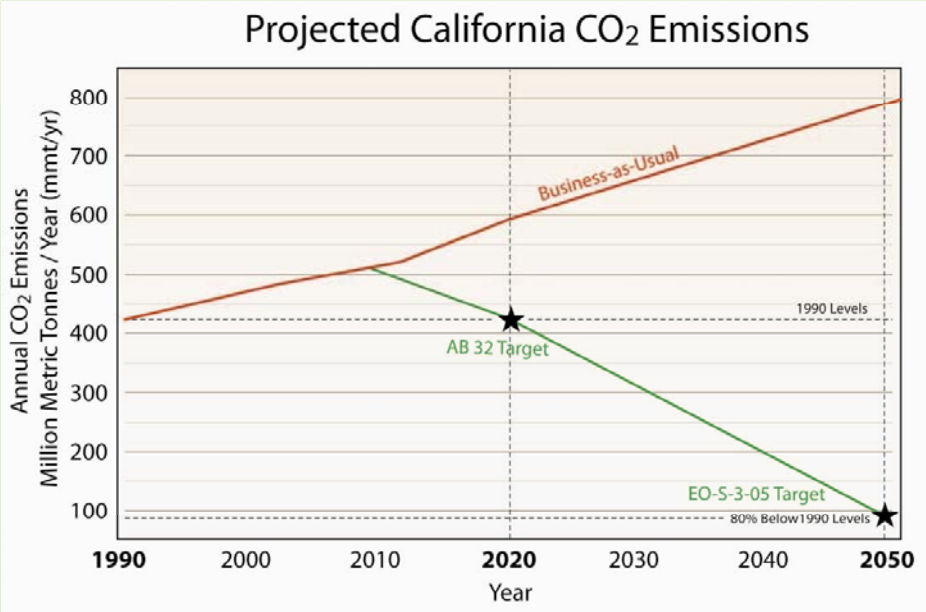
Decrease GHG emissions to 1990 levels by 2020

Executive Order- 03- 05 - ***June 2007***

Decrease GHG emissions to 80% below 1990 levels by 2050

Senate Bill 375 - ***September 2008***

Requires metropolitan planning organizations to include sustainable communities strategies in regional transportation plans for the purpose of reducing GHG emissions



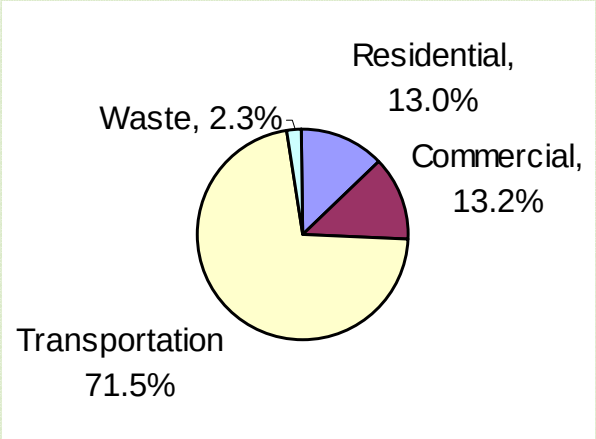
Albany's Climate Action Plan

- Purpose
  - Describe innovative steps for City departments and agencies to reduce GHG emissions
  - Identify steps that will reduce emissions within the community (businesses & residents)
  - Propose strategies and actions designed to achieve target GHG reduction goal
  - Create a framework for monitoring progress towards goals

Preparing the Climate Action Plan

- Key Steps
  - Propose a GHG reduction goal to be achieved by target year
  - Inventory GHG emissions from private and public activities to create base case scenario
  - Establish effective GHG reduction measures for major sources of emissions

2004 Albany GHG Emissions by Sector



Source: ICLEI, 2004

Considerations when selecting GHG reduction measures

- What types of emissions can the City actually control, and which are better addressed at the State level?
- What is the emission reduction potential of the measure?
- What is the total cost and related effectiveness?
- Choose the low-hanging fruit (first go after quick wins and then address longer timescale measures)
- Build on Albany Clean & Green Task Force Recommended Action Plan
- Make sure progress indicators and regular reporting procedures are established when emissions reduction targets are created

GHG reduction best practices

- Land Use
  - Focus development in transit corridors
  - Mixed residential and commercial uses
  - Walkable full-service neighborhoods
- Transportation
  - Pedestrian/bicycle infrastructure
  - Expanded public transit systems
  - Removal of minimum parking standards
- Green Building
  - Zero-energy buildings
  - LEED certification for all new buildings
  - Construction waste recycling centers

GHG reduction best practices

- Energy Efficiency
  - District heating and cooling
  - Retrofit and remodel requirements
  - Urban heat island reduction
- Renewable Energy
  - Municipal low-interest loans to homeowners
  - Green power purchase
  - Solar hot water heaters
- Water Conservation
  - Water sensitive urban design techniques
  - ‘Purple pipe’ water recycling
  - Water-efficient technologies

GHG reduction best practices

- Recycling and Waste
  - Zero-waste communities
  - Food waste and organics collection
  - Alternative fuel waste collection vehicles
- Public Outreach
  - Commercial and residential energy audits
  - ‘20% challenge’ citizen certificate program
  - Green business certification program

What can I do right now?

	Voluntary reduction steps	Emission reduction potential (tonnes/yr)
	*Walk or Bike to Work and Shopping*	11
	*Ride Public Transit to Work*	9
	*Shut off Lights and Appliances When Not in Use*	.3 to .5
	*Install Solar Photovoltaic Panels + Water Heater*	1.5 to 6.5
	*Purchase 100% Renewable Electricity*	4
	*Install a High Efficiency Furnace + Insulation*	.5 to 4.0
	*Buy Efficient Hybrid Cars (40+ MPG)*	1.3 to 8

How Can I Get Involved?

- Albany Sustainability Committee
  - Meets monthly
  - Oversight for Climate Action Plan
  - Meetings open to the public
- Take our online survey
  - www.albanyca.org
- Calculate your carbon footprint
  - www.coolcalifornia.org
- Contact City staff
  - nalmaguer@albanyca.org

Questions and Answers

Climate Action Survey

The City of Albany is currently preparing a Climate Action Plan aimed at reducing the city's GHG emissions. In preparing the plan, the City would like input from its residents, employees and businesses, in order to understand the level of support for different types of reduction strategies. Thank you for participating in the following survey.

Background:
Greenhouse gas (GHG) emissions are changing the earth's climate and pose a serious threat to our economic well-being, public health, and the environment. In 2007, the California Legislature passed an Assembly Bill requiring the State to reduce GHG emissions to 1990 levels by the year 2020. To achieve this goal in Albany, a 25 % reduction in emissions is required.

Intro Question:

- Which of the following describes you:
    - Resident of Albany
    - Owner of a business in Albany
    - Employee of a business that operates in Albany
    - Other [*Text Input Box*]

Transportation
Background: Transportation generates 71% of the GHG emissions in Albany. Private automobile trips create a substantial part of these emissions.

- How do you typically commute to work? (select one that represents your normal travel mode)
    - Private car (alone)
    - Carpool
    - BART
    - Ferry
    - Amtrak
    - Bus
    - Bicycle
    - Walk
    - Work from home
    - Other [*Text Input Box*]

- How often do you ride public transit (other than to commute)? (select one)
    - Every day
    - Multiple times per week
    - Once a week
    - Every month
    - Only a few times a year
    - Never

- Which of the following would make you consider riding transit more often? (select all that apply)
    - More convenient transit stops closer to home, work, shopping, and recreation
    - More expensive gas
    - More expensive tolls
    - Cleaner and safer transit
    - A free shuttle from public transit stations to work
    - If using transit was faster than driving
    - Other [*Text Input Box*]

- Which of the following would make you consider riding a bicycle more often (select all that apply)
    - Traffic calming measures
    - More cycle storage facilities at stations
    - More secure parking in retail areas
    - More bike lanes
    - Safer bike lanes
    - Bike avenues where only bikes and local auto traffic is allowed

Buildings:
Background: Energy use in residential and commercial buildings accounts for approximately 26% of Albany's GHG emissions. Most greenhouse gas reduction strategies for buildings involve energy efficiency improvements.

- Which of the following would you be willing to do in your home to reduce your energy usage? (select all that apply)
    - Change light bulbs to more energy efficient alternatives ($5 per bulb)
    - Replace refrigerator with more energy efficient model ($900)
    - Insulate home ($4,000)
    - Install solar hot water heater ($5,000)
    - Install Photovoltaic Solar Panels on the roof ($18,000)
    - Others [*Text Input Box*]
    - Please list all improvements you have already made [*Text Input Box*]

- Should the City require that buildings be retrofitted to a higher level of energy efficiency at the time of resale, or major additions and remodels?
    - Yes
    - No
    - Other Comments [*Text Input Box*]

- Should the City provide low interest loans to property owners who want to retrofit their homes or businesses to be more energy-efficient?
    - Yes
    - No
    - Other Comments [*Text Input Box*]

- Would you participate in a no-cost home or business energy audit that could demonstrate easy ways to reduce your energy consumption?
    - Yes
    - No
    - Other Comments [*Text Input Box*]

Neighborhood:
Background: Numerous studies show that, on average, people who live in pedestrian-oriented mixed-use neighborhoods make fewer vehicle trips than those who live in typical single-family neighborhoods.

- Which of the following stores and services do you regularly walk to rather than drive?
    - Grocery store
    - Restaurant
    - Bar
    - Bakery
    - Post office
    - Hair dressers
    - Gym
    - Hardware store
    - Day care
    - Elementary school
    - None of the above
    - Other [*Text Input Box*]

Effective pedestrian/bicycle networks are also critical to reduce vehicle trips and related emissions.

- From your home or office, how long would it take to safely walk to purchase daily goods and services (grocery store, café, post office, bakery, gym, restaurants)?
    - 5 minutes
    - 10 minutes
    - 15 minutes
    - Greater than 15 minutes
    - Not possible

- Do safe routes exist for children to walk or bike to school in your neighborhood?
    - Yes
    - They are okay, but not great. (How would you improve this?) [*Text Input Box*]
    - No (How would you improve this?)

Renewable Energy:
Background: Renewable energy (such as wind, solar, hydroelectric, and geothermal energy) has the potential to greatly reduce emissions. Many utilities are investing in renewable energy to reduce emissions and to offer customers greener energy options.

- The average Bay Area household spends $150 a month on home energy bills. Would you be willing to spend an additional $6 a month on your energy bill to offset all GHG emissions associated with the energy used in your home?
    - Yes
    - No
    - Other Comments [*Text Input Box*]

- Should the City install renewable energy facilities (such as photovoltaic panels or wind turbines) on City buildings and properties?
    - Yes
    - No
    - Other Comments [*Text Input Box*]

Water:
Providing, transporting and purifying water in California consumes large amounts of energy and creates substantial GHG emissions.

- Which of the following water saving strategies should the City and the Utility District implement?
    - Provide credits on water bills if a household uses less than an established number of gallons per month
    - Provide no-cost voluntary home and business water audits to identify ways to reduce both consumption and water bills
    - Charge high water users progressively higher rates
    - Require new construction and major remodels/additions to use the lowest water consuming appliances available
    - Other Comments [*Text Input Box*]

Support for Emission Reductions:
To what extent would you support City-led efforts to meet mandated greenhouse gas emissions targets?

- I would not support the efforts at all.
- I would support voluntary incentive-based measures, but that is all.
- I would support the City in creating mandatory requirements in order to meet the targets.
- I would support mandatory requirements and increased taxes in order to meet the targets.

Adaptation:

Climate change experts predict that the sea level in the San Francisco Bay could rise considerably by the year 2100. Such increases in sea level could threaten property, infrastructure, habitat, and recreational areas within the City.

- How should the City respond to this threat?
    - Not much we can do about it
    - Build levees to protect property
    - Ensure that land uses in shoreline areas of the City are compatible with rising sea levels (such as park and recreation uses).

Participant Information:
Please provide a little information about yourself. Please note that all answers are anonymous and optional.

- What is your age?
    - 18 or under
    - 18-34
    - 35-65
    - 65 or over

- Do you own or rent property in the City?
    - Property Owner
    - Renter/Tenant

- What is your household's annual income?
    - 0 to 20,000
    - $20,000 to $40,000
    - $40,000 to $70,000
    - $70,000 to $100,000
    - $100,000 to $250,000
    - $250,000+

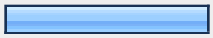
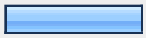
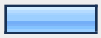
Thank you for completing our survey. If you would like more information regarding the City's Climate Action Plan, please contact Nicole Almaguer, Environmental Specialist, at (510) 528-5754.

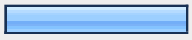
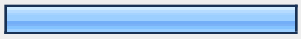
Data Sources:

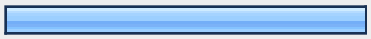
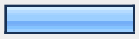
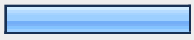
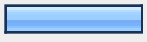
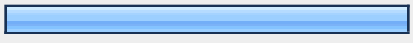
- ***American Council for an Energy Efficient Economy*** *– solar water heater price (http://www.aceee.org/consumerguide/waterheating.htm)*
- ***City of Albany and ICLEI –*** *2006 greenhouse gas inventory*
- ***Costhelper.com*** *– home insulation costs (http://www.costhelper.com/cost/home-garden/insulation.html)*
- ***Nevada Power*** *– Price of solar PV panels and installation – (http://www.nevadapower.com/renewablesenvironment/renewablegenerations/faqs.cfm)*
- ***Pacific Gas and Electric*** *– CFL bulb data and monthly household energy costs – (http://www.pge-cfl.com/) and (http://www.pge.com/microsite/calculator/calc1.jsp)*
- ***State of Hawaii*** *– Department of Business, Economic Development and Tourism – home insulation data – (http://hawaii.gov/dbedt/info/energy/publications/roofinsulation.pdf)*
- ***US EPA – Energy Star Program*** *– efficient refrigerator data – (http://www.energystar.gov/index.cfm?fuseaction=refrig.display_products_html)*

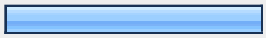
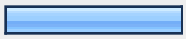
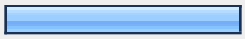
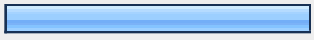
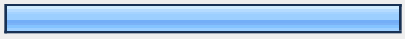
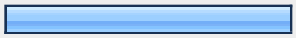
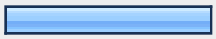
Albany Climate Action Plan Survey

1. Which of the following describes you: (select all that apply)			
		Response Percent	**Response Count**
Resident of Albany		**82.0%**	**132**
Owner of a business in Albany		8.1%	13
Employee of a business that operates in Albany		10.6%	17
Other (please specify)		14.9%	24
		answered question	**161**
		skipped question	**1**

2. How do you typically commute to work? (select one that represents your normal travel mode)			
		Response Percent	**Response Count**
Private car (alone)		**30.8%**	**45**
Carpool		3.4%	5
BART		9.6%	14
Ferry		0.0%	0
Amtrak		0.0%	0
Bus		7.5%	11
Bicycle		10.3%	15
Walk		4.1%	6
Work from home		20.5%	30
Other (please specify)		13.7%	20
		answered question	**146**
		skipped question	**16**

3. How often do you ride public transit (other than to commute)? (select one)			
		Response Percent	Response Count
Every day		3.4%	5
Multiple times per week		6.2%	9
Once a week		9.0%	13
Every month		27.6%	40
Only a few times a year		**44.8%**	**65**
Never		9.0%	13
	answered question		**145**
	skipped question		**17**

4. Which of the following would make you consider riding transit more often? (select all that apply)			
		Response Percent	Response Count
More convenient transit stops closer to home, work, shopping, and recreation		55.4%	77
More expensive gas		19.4%	27
More expensive tolls		7.2%	10
Cleaner and safer transit		28.1%	39
A free shuttle from public transit stations to work		20.9%	29
If using transit was faster than driving		**61.9%**	**86**
Other (please specify)		27.3%	38
	answered question		**139**
	skipped question		**23**

5. Which of the following would make you consider riding a bicycle more often? (select all that apply)			
		Response Percent	Response Count
Traffic calming measures		39.1%	52
More cycle storage facilities at stations		27.1%	36
More secure parking in retail areas		36.1%	48
More bike lanes		46.6%	62
Safer bike lanes		**60.9%**	**81**
Bike avenues where only bikes and local auto traffic is allowed		43.6%	58
Other (please specify)		31.6%	42
	answered question		**133**
	skipped question		**29**

6. Which of the following would you be willing to do (or have already done) in your home to reduce your energy usage? (select all that apply)

	Response Percent	Response Count
Change light bulbs to more energy efficient alternatives ($5 per bulb)	**93.2%**	**136**
Replace refrigerator with more energy efficient model ($900)	56.8%	83
Insulate home ($4,000)	47.3%	69
Install solar hot water heater ($5,000)	30.1%	44
Install photovoltaic solar panels on the roof ($18,000)	26.7%	39
Other (please specify)	31.5%	46
	answered question	**146**
	skipped question	**16**

7. Should the City require that buildings be retrofitted to a higher level of energy efficiency at the time of resale, or major additions and remodels? (select one)

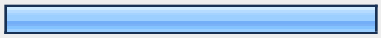
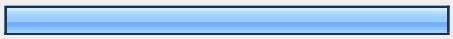
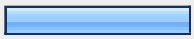
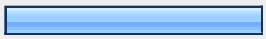
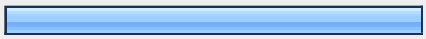
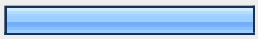
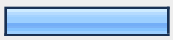
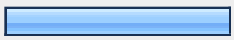
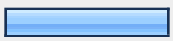
	Response Percent	Response Count
Yes	**63.5%**	**87**
No	36.5%	50
	Comments	36
	answered question	**137**
	skipped question	**25**

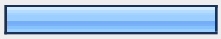
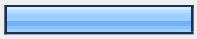
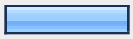
8. Should the City provide low interest loans to property owners who want to retrofit their homes or businesses to be more energy-efficient? (select one)

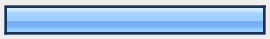
	Response Percent	Response Count
Yes	**84.7%**	**116**
No	15.3%	21
Comments		20
answered question		**137**
skipped question		**25**

9. Would you participate in a no-cost home or business energy audit that could demonstrate easy ways to reduce your energy consumption? (select one)

	Response Percent	Response Count
Yes	**81.6%**	**111**
No	18.4%	25
Comments		20
answered question		**136**
skipped question		**26**

10. Which of the following stores and services do you regularly walk to rather than drive? (select all that apply)			
		Response Percent	Response Count
Grocery store		57.0%	81
Restaurant		**68.3%**	**97**
Bar		28.2%	40
Bakery		39.4%	56
Post office		64.1%	91
Hair dressers		38.0%	54
Gym		24.6%	35
Hardware store		12.7%	18
Day care		8.5%	12
Elementary school		34.5%	49
None of the above		12.7%	18
Other (please specify)		24.6%	35
	answered question		**142**
	skipped question		**20**

11. From your home or office, how long would it take to safely walk to purchase daily goods and services (grocery store, café, post office, bakery, gym, restaurants)? (select one)			
		Response Percent	**Response Count**
5 minutes		16.4%	23
10 minutes		**32.1%**	**45**
15 minutes		28.6%	40
Greater than 15 minutes		18.6%	26
Not possible		4.3%	6
		Comments	24
		answered question	**140**
		skipped question	**22**

12. Do safe routes exist for children to walk or bike to school in your neighborhood? (select one)			
		Response Percent	**Response Count**
Yes		39.7%	54
They are okay, but not great. (How would you improve this?)		**50.0%**	**68**
No (How would you improve this?)		10.3%	14
		Comments	78
		answered question	**136**
		skipped question	**26**

13. The average Bay Area household spends $150 a month on home energy bills. Would you be willing to spend an additional $6 a month on your energy bill to offset all GHG emissions associated with the energy used in your home? (select one)

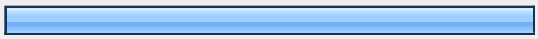
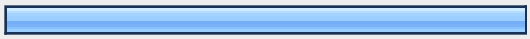
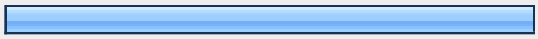
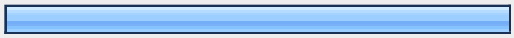
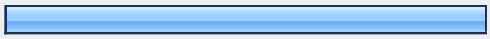
	Response Percent	Response Count
Yes	**75.0%**	**102**
No	25.0%	34
Comments		39
answered question		**136**
skipped question		**26**

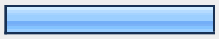
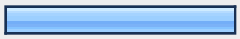
14. Should the City install renewable energy facilities (such as photovoltaic panels or wind turbines) on City buildings and properties? (select one)

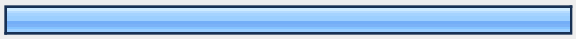
	Response Percent	Response Count
Yes	**90.6%**	**126**
No	9.4%	13
Comments		38
answered question		**139**
skipped question		**23**

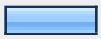
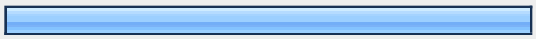
15. Which of the following water saving strategies should the City and the Utility District implement? (select all that apply)

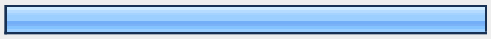
	Response Percent	Response Count
Provide credits on water bills if a household uses less than an established number of gallons per month	**79.3%**	**107**
Provide no-cost voluntary home and business water audits to identify ways to reduce both consumption and water bills	**79.3%**	**107**
Charge high water users progressively higher rates	66.7%	90
Require new construction and major remodels/additions to use the lowest water consuming appliances available	74.1%	100
Comments		24
answered question		**135**
skipped question		**27**

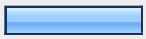
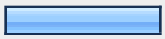
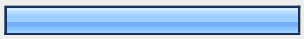
16. Which of the following waste reduction strategies should the City implement? (select all that apply)			
		Response Percent	**Response Count**
Establish a City goal to become a ‘ Zero Waste’ community.		73.3%	99
Adopt a City goal that no compostable organics (food scraps, yard trimmings, etc) go to landfills or incinerators by 2015.		**81.5%**	**110**
Provide incentives to encourage on-site composting at homes, schools, and businesses with sufficient space.		80.0%	108
Require construction waste minimization and recycling standards for all new construction, major addition and remodel projects.		**81.5%**	**110**
Explore the creation of a resource recovery district within the City to facilitate recycling, composting, and reuse of materials.		77.8%	105
Work with other cities and agencies to create ‘Extended Producer Responsibility’ legislation that would require companies to take back designated products at the end of the product life cycle.		74.1%	100
		Comments	24
		answered question	**135**
		skipped question	**27**

17. To what extent would you support City-led efforts to meet mandated greenhouse gas emissions targets? (select one)			
		Response Percent	Response Count
I would not support the efforts at all.		2.9%	4
I would support voluntary incentive-based measures, but that is all.		30.2%	42
I would support the City in creating mandatory requirements in order to meet the targets.		31.7%	44
I would support mandatory requirements and increased taxes in order to meet the targets.		**35.3%**	**49**
	answered question		**139**
	skipped question		**23**

18. How should the City respond to this threat? (select one)			
		Response Percent	Response Count
Not much we can do about it		8.7%	11
Build levees to protect property		4.0%	5
Ensure that land uses in shoreline areas of the City are compatible with rising sea levels (such as park and recreation uses).		**87.3%**	**110**
		Comments	26
	answered question		**126**
	skipped question		**36**

19. What is your age? (select one)			
		Response Percent	Response Count
18 or under		2.9%	4
18-34		13.8%	19
35-65		**81.2%**	**112**
65 or over		2.2%	3
	answered question		**138**
	skipped question		**24**

20. Do you own or rent property in the City? (select one)			
		Response Percent	Response Count
Property Owner		**73.8%**	**93**
Renter/Tenant		26.2%	33
	answered question		**126**
	skipped question		**36**

21. What is your household's annual income? (select one)			
		Response Percent	Response Count
0 to $20,000		2.4%	3
$20,000 to $40,000		3.9%	5
$40,000 to $70,000		20.5%	26
$70,000 to $100,000		23.6%	30
$100,000 to $250,000		**44.9%**	**57**
$250,000+		4.7%	6
	answered question		**127**
	skipped question		**35**

Appendix E.

References and Personal Communications

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Irvine Ranch Water District. 2006. Commercial ET-Based Irrigation Controller Water Savings Study. Available at: <http://www.irwd.com/Conservation/water_conservation_research.php >. Accessed July 15, 2009.

Personal Communications

Strunin, Jonathan. Program Officer. ICLEI Local Governments for Sustainability U.S.A. Oakland, CA. September 4, 2008—email sent to George Lu of EDAW containing the final Albany GHG inventory.

Tholen, Greg. Senior Environmental Planner. Bay Area Air Quality Management District, San Francisco, CA. December 15, 2008—e-mail to Heather Phillips of EDAW regarding relative proportion of Commercial/Industrial sector natural gas emissions from BAAQMD's GHG Emissions Inventory.

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