# Introduction

The City of Benicia is joining an increasing number of California communities in developing plans to address climate change at a local level. Although climate change is a global problem, city leaders in the U.S. and abroad are increasingly recognizing that it will directly affect their constituents and pose risks to public health, safety, and welfare. It is also at the local level that many strategies to both adapt to the changing climate and combat its progression are best enacted. In 2007, Benicia's City Council adopted a resolution to act on climate change and officially join ICLEI - Local Governments for Sustainability's Cities for Climate Protection Campaign. This plan sets forth a series of actions Benicia can take to reduce its contribution to global climate change by lowering its greenhouse gas emissions.

## PURPOSE, SCOPE, AND ORGANIZATION OF THE CLIMATE ACTION PLAN

### Purpose

The Climate Action Plan is based on the premise that local governments and the communities they represent are uniquely capable of addressing many of the major sources of the emissions within their jurisdictions that contribute to global warming. The purpose of the Climate Action Plan is to provide objectives and strategies that guide the development and implementation of actions that cut Benicia's greenhouse gas emissions (GHG) to meet its goal of reducing GHG emissions to 2005 levels by 2010 and reducing GHG emissions to 10 percent below 2000 levels by 2020.

### Scope

This Plan covers objectives and strategies for the reduction of greenhouse gas emissions from municipal and community-wide activities within the City. It addresses the major sources of emissions in Benicia and sets forth objectives and strategies in eight focus areas that the City and community can implement to achieve greenhouse gas reductions: education and public outreach, energy production, transportation and land use, buildings, industrial and commercial, water and wastewater, solid waste, and parks and open space. In addition, it provides an estimated range of GHG emission reductions associated with each objective and a relative set of percentages for each strategy, based on levels of adoption and implementation (see Layout Guide on page 17).

### Organization

The Climate Action Plan is organized into the following chapters:

**Introduction –** provides an overview of the ICLEI five step process that is being followed to reduce greenhouse gas emissions. This chapter summarizes the first two steps (Inventory and Targets), which were completed in September 2008, and describes the planning process for developing the Climate Action Plan (step three).

**Climate Change Science + Policy –** summarizes the changes that are taking place in the Earth's atmosphere as a result of human activity and describes the effects they will have locally. This chapter also describes legislation and policies being implemented at international, national, State, and local levels to combat climate change.

**Emission Reduction Measures –** organizes objectives and strategies to reduce locally generated emissions in each of the eight focus areas. An implementation phasing sequence and indicators to track progress are identified in the summary matrix (page 83) for each objective.

**Conclusion –** compares emission reduction measures to the adopted City and Community targets.

**Strategy Summary Table —** available as a standalone document on the Climate Action Plan website. It is administered by the Community Sustainability Commission and will be regularly updated with performance measures/indicators, phasing, etc for each strategy.

# CLIMATE ACTION PLANNING PROCESS

## Strategy

In 2007, the Benicia City Council took its first steps to combat climate change by adopting Resolution No. 07-126 authorizing membership in ICLEI and their Cities for Climate Protection Campaign. The City chose to follow ICLEI's Five Milestones Process for Climate Protection:

1. Conduct a baseline emissions inventory and forecast
2. Adopt an emissions reduction target for the forecast year
3. Develop a climate action plan
4. Implement plan policies and measures
5. Monitor and verify results

The City has achieved the first three steps of the Five Milestones process. The City has begun the final two steps commenced after City Council's adoption of the Climate Action Plan. The following section is a summary of the first two steps and a description of the planning process for the Climate Action Plan.

## Process

### Step 1: Baseline Emissions Inventory and Forecast

The purpose of an emissions inventory is to identify and categorize the major sources and quantities of greenhouse gas emissions produced by the city's residents, businesses and municipal operations. Benicia's Emissions Inventory was completed by City staff in September 2008, using the Clean Air Climate Protection (CACP) software provided by ICLEI; on September 16, 2008 the City Council accepted the inventory and established reduction targets by adopting Resolution No. 08-103.

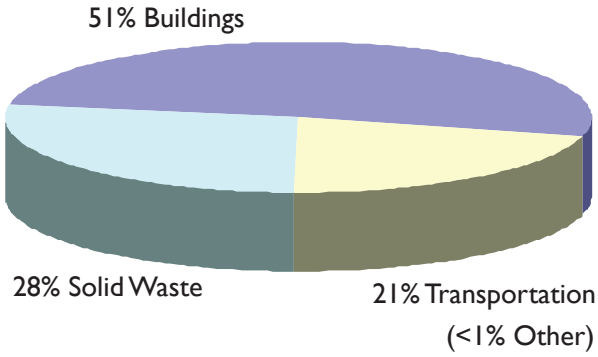
The City Government's Greenhouse Gas Emissions Inventory Report provides emissions data for the baseline year, 2000 (the earliest year for which sufficient data is available), and an interim year, 2005. The data provides a framework on which to base objectives and strategies that specifically address Benicia's sources of emissions. These measures are presented in Chapter 3. The inventory also serves as a reference against which to measure the progress towards reducing greenhouse gas emissions over time.

The Emissions Inventory Report contains two sets of data, which represent an inventory for City operations and a separate inventory for the Community's emissions as a whole. The Community emissions include City operations. Both inventories evaluate a range of focus areas. The inventory does not include emissions from port operations; air, water and rail travel; or, regional commuter traffic. Existing greenhouse gas modeling software available to local governments is not sophisticated enough to include regional commute patterns; however, policy decisions should consider potential implications on regional commute traffic. Future inventories should include data as it becomes accessible.

## City Government Inventory

The City operations inventory examined greenhouse gas emissions attributed to the City Government in the sectors of Buildings, Vehicle Fleet, Commute, Streetlights, Water/Sewage Systems, Waste, and Other Activities (paint shop, generators, etc.) (Figure 1.1). In 2000, the City's total emissions were 9,202 carbon dioxide equivalent metric tonnes ($CO_2$EMT). Buildings were responsible for the largest percentage of greenhouse gases at 51 percent followed by waste at 28 percent.

**2000 City Government Emissions**

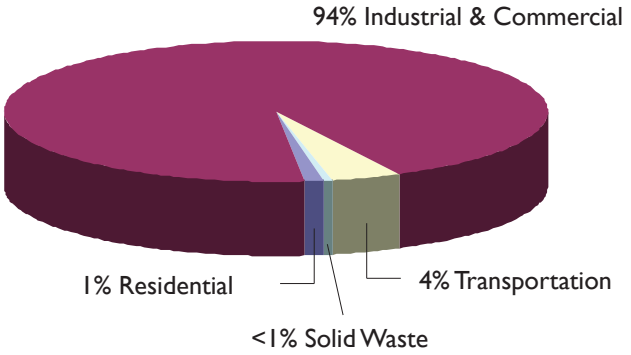



*Source: City of Benicia (2008)*

## Community Inventory

The Community emissions inventory was organized into Transportation, Waste, Residential, and Commercial/Industrial sectors and also includes City Government emissions. In 2000, the Community's total emissions were 4 million tonnes. By 2005, emissions increased 5.6 percent to 4.25 million tonnes. The largest emitter in both 2000 and 2005 was Commercial/Industrial/Other (businesses), which included the Valero refinery, at more than 94 percent (Figure 1.2).

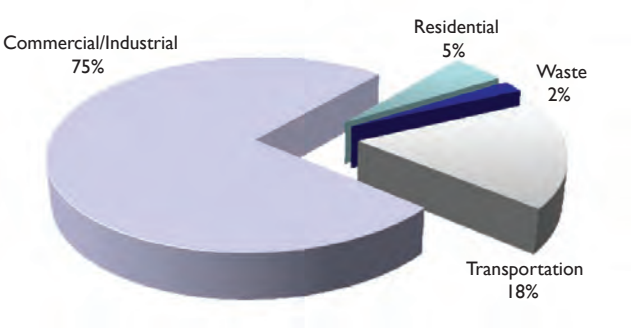
### 2000 Community Emissions




*Source: City of Benicia (2008)*

The chart below shows the Community's emissions, excluding the two largest emitters, Valero Refinery and the Port of Benicia. When these emitters have been disaggregated from the data, it is evident that Benicia's emissions are still largely dominated by the industrial sector with transportation taking another significant portion. These have been omitted for argument's sake in order to demonstrate that even without the City's two largest industrial stakeholders, the City's industrial base still has a profound impact on our emissions, identifying a large opportunity area for emission reductions, through means of sustainable economic development. This graph is also a good indication of the emission sources that the City has the ability to directly influence based on permitting and infrastructure authority.

### 2005 Community Emissions Excluding Valero and the Port of Benicia




*Source: City of Benicia (2008)*

Benicia's disproportionate percentage of commercial/industrial related emissions must be taken seriously, however, they should not be used to dwarf the importance of behavioral change of residents.

### Business as Usual Forecast

Under a forecasted business as usual scenario, the community wide emissions in 2010 will increase by 9 percent from 2005 to 4.6 million tonnes. By 2020 emissions are forecasted to increase by 21 percent to 5.1 million tonnes. For City Government operations, business as usual would result in 8,300 tonnes of emissions in 2010 and 9,400 tonnes in 2020.

### Step 2: Adopt Emissions Reduction Target for the Forecast Year

Emissions reduction targets are a vital component of greenhouse gas reduction efforts. According to the Cities for Climate Protection Campaign (2008), the reduction target is essential to both foster political will and to create a framework that guides planning and implementation.

A target provides a goal toward which the Community can strive to meet, and against which progress can be measured.

Benicia's inventory estimates and forecasts led to reduction goals for both the City and the Community emissions. On September 16, 2008, the Benicia City Council accepted the Greenhouse Gas Emissions Inventory Report and adopted the greenhouse gas reduction targets for City operations and the community as a whole, as follows:

#### City Government operations

- Reduce GHG emissions to 25 percent below 2000 levels by 2010
- Reduce GHG emissions to 33 percent below 2000 levels by 2020

#### Community-wide

- Reduce GHG emissions to maintain 2005 levels by 2010
- Reduce GHG emissions to 10 percent below 2000 levels by 2020

The targets are consistent with Assembly Bill 32 (AB 32)[1], and in some cases, the Kyoto Protocol.[2]

1) Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006, is a California law that established a timetable to move California closer to the greenhouse gas emissions goals established by the Kyoto Protocol.
2) The Kyoto Protocol is an international protocol that sets binding targets for its signatories to reduce greenhouse gas emissions in industrialized nations. The Kyoto Protocol was not ratified by the United States, but was used as a source of inspiration for AB 32.

**Step Three: Develop a Local Climate Action Plan**

The City partnered with the Cal Poly, San Luis Obispo City and Regional Planning department to carry out the third step of the Five Milestones process—development of a Climate Action Plan. The Plan was developed in three phases. Cal Poly was responsible for Phase One and Two and City staff for Phase Three.

- Phase 1: Background research, including an audit of existing policies and programs that support or potentially conflict with the City Government's emissions reduction goals; a review of existing climate change policy plans to assess strategies used by other jurisdictions to lower greenhouse gas emissions; and, public workshops to gather community input
- Phase 2: Preliminary Draft of Climate Action Plan – Identify specific emission reduction objectives and strategies, develop indicators to track progress, and provide policy recommendations for implementation.
- Phase 3: Final Draft of Climate Action Plan – Staff edited Cal Poly's preliminary draft and added emission reduction range percentages for each strategy.

## PUBLIC OUTREACH

Public outreach yields valuable information from individuals most knowledgeable about the community - its residents. Community engagement provided a forum for citizens to share ideas regarding ways that Benicia can adapt to climate change and reduce greenhouse gas emissions.

The Cal Poly team conducted numerous community outreach events with local stakeholders. The consulting team facilitated two visioning workshops, one at Benicia High School to engage the teenage population, and a second at the Senior Center that targeted all community stakeholders. An interactive web site provided an additional opportunity for residents to participate in the Plan preparation process. The website enabled the community to participate in a survey, offer suggestions, and learn about climate protection planning in other communities. Targeted interviews were conducted with stakeholders to gather information about operations and current actions undertaken by various public and private entities. The Cal Poly Consulting Team presented their findings at a March 2009 Planning Commission meeting.

The visioning workshops established a foundation for community involvement and encouraged public participation in the creation of the Draft Climate Action Plan. Building and maintaining feedback mechanisms, such as the interactive website, provided a valuable vehicle for broadening the public outreach and ensuring that the community's views are reflected in the Climate Action Plan.

# WHAT DATA WENT INTO THE EMISSIONS INVENTORY?

## COMMUNITY EMISSIONS

** Includes City government emissions*

### Vehicle Miles Traveled (VMT)

**255,064 Thousand VMT**
**158,346 CO2EMT in 2005**

*This data is measured in Vehicle Miles Traveled (VMT). It includes estimates of all trips on public roadways within the City, including I-680, I-780, City streets, roads within the Benicia State Recreation Area, vehicle trips on Port of Benicia property and Allied Waste Services' mileage associated with garbage and recycling.*

### Electricity and Natural Gas

**234,747,060 kWh**
**162,571,423 terms**
**717,458 CO2EMT in 2005**

*Data for electricity (kWh) and natural gas (therms) use provided by PG&E. Contains all residential, commercial, and industrial PG&E use that was not from direct access accounts, such as Valero.*

### Solid Waste

**28,194 tons of solid waste**
**21,998 CO2EMT in 2005**

*This data includes all Benicia's residential and commercial/ industrial waste picked up and hauled by franchise holder Allied Waste Services, the City's refuse hauler in both years, as well as an estimate of the Benicia Unified School District's waste.*

### Large Stationary Emitters

**Over 800,000 CO2EMT in 2005**

*Benicia has two large industrial businesses, the Valero Refinery and the Port of Benicia. The 2005 data for Valero is a non-certified estimate; only data from 2006 forward have been certified by a third party.*

**What is not Included in the City Government Emissions Inventory?**

- *Employee and contractor travel on City business outside of City limits or in private vehicles*
- *Supply chains of purchased products*

## CITY GOVERNMENT EMISSIONS

** City government emissions are included in the total Community emissions*

### Municipal Vehicle Fleet

**69,440 gallons of gasoline**
**12,640 gallons of diesel**
**2,333 CO2EMT in 2005**

*Municipal vehicle fleet data includes all city vehicles including Benicia Breeze Buses. Since more detailed data was available, actual fuel consumption numbers were used rather than VMT estimates.*

### Employee Commute

**2,050 Thousand VMT**
**876 CO2EMT in 2005**

*A six-mile round trip commute was assumed for employees who live within Benicia. Commutes for both full-time employees, at an estimated five round trips per week, and part-time employees, at an estimated three round trips per week, were calculated for 47 weeks per year.*

### Electricity and Natural Gas

**10,889,738 kWh**
**251,616 terms**
**3,187 CO2EMT in 2005**

*Electricity (kWh) and natural gas (therms) use data were used to calculate the emissions from City buildings, streetlights, traffic signals, and water and wastewater systems.*

### Solid Waste

**3,556 tons of solid waste**
**2,483 CO2EMT in 2005**

*For waste, only wastewater sludge (sludge, a.k.a. biosolids, is residual material left over after processing) is included in Benicia's inventory, because municipal solid waste data was not available as a stand-alone account.*

**What is not Included in the Community Emissions Inventory?**

- *Rail transportation*
- *Marine transportation*
- *Air transportation overhead*
- *Underground activities, like pipelines through the City*
- *Port cargo handling and*
- *Valero's PG&E usage*
- *Activities near but not within the City limits (reserve fleet, Syar facility, etc)*
- *Activities by citizens beyond City limits, although the impact of driving the community's waste to landfills outside the City limits was included*

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