City of Emeryville
Climate Action Plan
November 2008

Environment Equity Economy

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Executive Summary

The debate is over. The overwhelming scientific consensus is that human-induced climate change is among the most pressing environmental and social problems facing this generation and those to come.

The time to act is now. Never in the past 1000 years has the planet warmed at a faster rate than during the 20th century, and the most recent decade has been the warmest ever on record. Allowing this trend to continue could result in decreased agricultural output, increased catastrophic weather events such as forest fires, drought and floods and displacement of entire populations due to rising sea levels.

The City of Emeryville must do its part. Although the United States accounts for a mere 4% of the world's population, it produces 20.4% of the world's greenhouse gases, according to Table No. 1 on page 5. The City of Emeryville released an estimated 178,832 tons of carbon dioxide equivalent (CO_2e) in 2004 and, if steps are not taken to achieve reductions, is projected to emit 33% more in 2020. However, in March of 2006 the City of Emeryville pledged to take action against this destructive trend by passing a resolution to join more than 230 U.S. local governments and 770 local governments worldwide in ICLEI's Cities for Climate Protection® (CCP) campaign. In so doing, Emeryville committed to ICLEI's 5-Milestone methodology for combating global warming. In December of 2006, the City approved the baseline inventory report from ICLEI and established a Climate Change Task Force to develop a Climate Action Goal and Plan. Then on May 1st, 2007, the City of Emeryville committed to reducing community-wide greenhouse gas emissions by 25% below 2004 levels by 2020.

Summary of Proposed Actions:

Community-Wide	Affected Sector
Increase Transit Oriented Development	New Development Projects
Adopt a Green Building and Bay-Friendly Ordinance	New Development Projects
Enhance Transportation Demand Management Conditions	New Development Projects
New Pedestrian, Cycling and Transit Programs & Incentives	All Sectors
Increase Transit Service and Ridership	All Sectors
Commercial and Residential Energy Conservation Ordinances	Existing Buildings and Homes
Develop and Incentivize Local Renewable Energy Production	All Sectors
Conserve Potable Water and Develop Rainwater Usage	All Sectors
Reduce 2004 Landfilled Waste Tonnage by 50% by 2020	All Sectors

Government Operations

GB/BFL for buildings and landscapes

Fleet changes – fuel and vehicle types

Reduce 2004 Landfilled Waste Tonnage by 50% by 2020

Environmentally Preferable Purchasing

Alternative Transportation Incentives/Initiatives

Background: The Alameda County Climate Protection Project

In June 2006 eleven local governments in Alameda County, CA committed to becoming members of ICLEI – Local Governments for Sustainability (ICLEI) and participating in the **Alameda County Climate Protection Project (ACCPP)**. The participating jurisdictions include:

Alameda	Berkeley	Newark	San Leandro
Alameda County	Emeryville	Oakland	Union City
Albany	Hayward	Piedmont	

The project was launched by ICLEI in partnership with the Alameda County Waste Management Authority & Recycling Board (StopWaste.Org) and the Alameda County Conference of Mayors. In committing to the project, the jurisdictions embarked on an ongoing, coordinated effort to reduce the emissions that cause global warming, improve air quality, reduce waste, cut energy use and save money. Toward that end, ICLEI and StopWaste.Org assisted each participating jurisdiction to conduct a baseline greenhouse gas emissions inventory, set a community-wide emissions reduction target, and develop a climate action plan that consists of polices and measures that, when implemented, will enable each jurisdiction to meet its target.

A model climate action plan was developed for use by the 11 participating local governments to create tailored climate action plans for their communities. Its purpose is to save participants' time and resources by providing a useful action plan format, background information on the science and impacts of global warming, and detailed suggestions on the types of policies that municipalities can implement to achieve the desired emissions reductions. In developing this resource, ICLEI relied on the expertise of StopWaste.Org staff as well as the experiences of the nationwide network of ICLEI member cities, each of which is working toward similar climate protection goals.

About Alameda County, California

Alameda County is a metropolitan region of the San Francisco Bay Area. The 2005 census estimates the County's population at 1.45 million, the 7th most populous county in the State of California. Like other metropolitan areas, inhabitants of the county and the cities therein contribute to the problem of global warming, while also holding immense potential to contribute to the solution. The energy consumed and the waste produced within the county's boundaries result in thousands of tons of heat-trapping greenhouse gas emissions. But, as is evidenced by the widespread municipal involvement in the Alameda County Climate Protection Project, the local government participants are firmly committed to building on existing efforts to reduce the emissions that cause global warming.

Regional governments and nations across the world can only manage what they measure. The first step in managing greenhouse gas emissions, therefore, is to establish an inventory of those emissions. Below is a chart of global greenhouse gas emissions, which includes the amount of short tons of carbon dioxide equivalent (tons CO_2e) that is generated worldwide, within the United States, the State of California, and in Alameda County. For context, California is the 16th largest emitter in the world - if it were considered a country of its own - second only to Texas in the US. Per capita emissions in California, however, are among the lowest in the US. Further, emissions in Alameda County are significantly less than the California average.

Table (1) World Greenhouse Gas Emissions Scenarios

Locations	GHG – Tons of CO_2e per year	Percent of World GHG Emissions	Percent of U.S.A Emissions	Percent of California Emissions
World (2000)	33,712,900,000	100.0%		
United States (2000)	6,871,700,000	20.4%	100%	
California (2004)	542,184,000	1.6%	7.9%	100.0%
ACCPP Region (2005) [1,2,3]	5,710,393		0.083%	1.105%
ACCPP Governments (2005)	80,532			0.015%

Source: (2000) World and United States emissions from World Resources Institute – Climate Analysis Indicators tool (http://cait.wri.org/). (2004) California emissions from California Energy Commission (http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF). Figures exclude land use related emissions.

Note: All units in this report are reported in short tons (tons). When source data is found in metric tonnes (MT or tonnes) to convert it into short tons (tons) a conversion factor of 1.102 short ton per metric ton is applied.

Per Capita Fast Facts

2000 Worldwide per capita GHG emissions	**5 tons CO_2e**
2004 US per capita GHG emissions	**23 tons CO_2e**
2004 California per capita GHG emissions	**17 tons CO_2e**

Additional source: 2004, U.S.A. GHG Emissions from EPA (http://www.epa.gov/climatechange/emissions/downloads06/06ES.pdf)

Fast Facts	*Alameda County*	*Emeryville*[5]
Population (2005):	**1.45 Million**	**8,650**
Number of Employees (2005)		**20,000**
Number of Autos (2000):	**4.5 Million**	**4000**
Annual Electricity Usage per Capita (2004):	**6,738 kWh**	
Annual Natural Gas Usage per Capita (2004):	**330 therms**	
Annual Water Usage per Capita (2004):	**46,000 gallons**	
Average Waste per person (2004):	**1.03 tons**	
Average Waste per Business[6] (2004) :	**35.0 tons**	**24.0 tons**
Average Waste Diversion Rate (2004):	**60%**	**64%**
Per capita GHG emissions[4]:	**5.86 tons CO_2e**	

Source: StopWaste.org and City of Emeryville

[1] Data includes the 10 cities in the ACCPP only (Alameda City, Albany, Berkeley, Emeryville, Hayward, Newark, Oakland, Piedmont, San Leandro and Union City).
[2] The Baseline year is 2005 for all cities, except for Albany and Emeryville which inventoried 2004 emissions.
[3] GHG emissions for ACCPP cities are based on ICLEI GHG Emissions Protocol for Local Governments, which includes end use energy, transportation and waste sector within city boundaries. World and U.S.A emissions are based on national GHG inventories which additionally include fugitive emissions, industrial process emissions, and other modes of transportation.
[4] Based on the emissions inventories conducted for the 11 participating local governments.
[5] Per Capita data for the City of Emeryville is not applicable in a predominantly commercial city.
[6] Average Business Waste calculated on estimated 600 businesses with 90% of 2004's 16,000 MSW tons

About the Sponsor: StopWaste.Org

This Alameda County Climate Protection Project was financially sponsored by StopWaste.Org in an effort to support its member agencies in building a region that is continually progressing toward environmentally and economically sound resource management. StopWaste.Org is a public agency formed in 1976 by a Joint Exercise of Powers Agreement among the County of Alameda, each of the fourteen cities within the county, and two sanitary districts. The agency serves as the Alameda County Waste Management Authority and the Alameda County Source Reduction and Recycling Board. In this dual role StopWaste.Org is responsible for the preparation and implementation of the County Integrated Waste Management Plan and Hazardous Waste Management Plan as well as the delivery of voter approved programs in the areas of waste reduction, recycled product procurement, market development and grants to non-profit organizations, to help the County achieve its 75% waste diversion goal.

Key program areas in which StopWaste.Org provides technical and financial assistance to its member agencies include:

→ Business recycling and waste prevention services through the StopWaste Partnership
→ Organics programs, including residential and commercial food waste collection and the promotion of Bay-Friendly Landscaping and gardening
→ Green building and construction and demolition debris recycling
→ Market development
→ Education and outreach, including schools recycling.

As is demonstrated in this document, many of StopWaste.Org's program areas dovetail nicely with municipal efforts to reduce greenhouse gas emissions. While the agency's charge to reduce the waste stream in Alameda County may seem external to traditional emissions reduction strategies, it is working closely with ICLEI in an ongoing way to illustrate the emissions benefits of waste reduction and recycling. Indeed, StopWaste.Org and ICLEI have compiled results in this report that show practices such as residential and commercial recycling and composting, buying recycled products, green building and Bay-Friendly Landscaping play an important role in a local government's emission mitigation strategy. In fact, climate change mitigation can be seen as an umbrella under which the agency's programs play a substantial role.

About ICLEI and the Cities for Climate Protection Campaign

ICLEI's mission is to improve the global environment through local action. The Cities for Climate Protection® (CCP) campaign is ICLEI's flagship campaign designed to educate and empower local governments worldwide to take action on climate change. ICLEI provides resources, tools, and technical assistance to help local governments measure and reduce greenhouse gas emissions in their communities and their internal municipal operations.

ICLEI's CCP campaign was launched in 1993 when municipal leaders, invited by ICLEI, met at the United Nations in New York and adopted a declaration that called for the establishment of a worldwide movement of local governments to reduce greenhouse gas emissions, improve air quality, and enhance urban sustainability. The CCP campaign achieves these results by linking climate change mitigation with actions that improve local air quality, reduce local government operating costs, and improve quality of life by addressing other local concerns. The CCP campaign seeks to achieve significant reductions in U.S. greenhouse gas emissions by assisting local governments in taking action to reduce emissions and realize multiple benefits for their communities.

ICLEI uses the performance-oriented framework and methodology of the CCP campaign's 5-Milestones to assist U.S. local governments in developing and implementing harmonized local approaches for reducing global warming and air pollution emissions, with the additional benefit of improving community livability. The milestone process consists of:

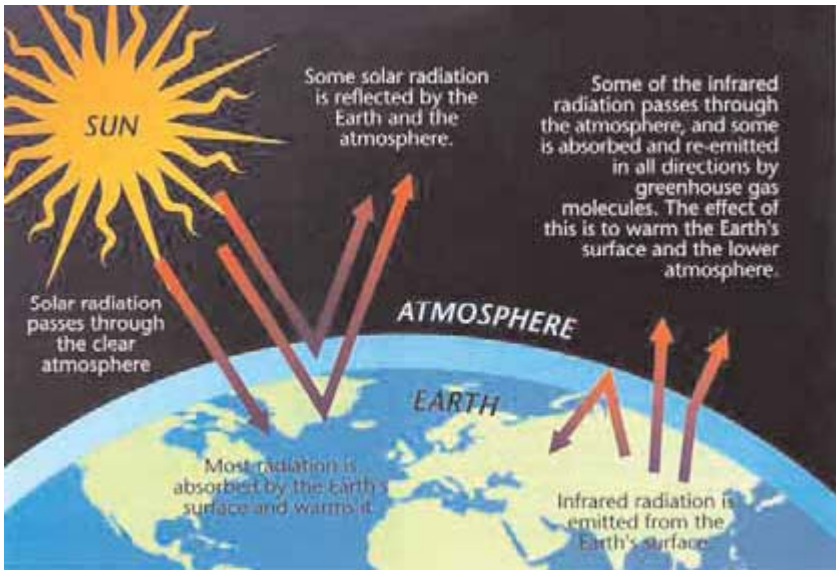
- Milestone 1: Conduct a baseline emissions inventory and forecast
- Milestone 2: Adopt an emissions reduction target
- Milestone 3: Develop a Climate Action Plan for reducing emissions
- Milestone 4: Implement policies and measures
- Milestone 5: Monitor and verify results

1. Introduction

1.1 Introduction to Climate Change Science

The Earth's atmosphere is naturally composed of a number of gases that act like the glass panes of a greenhouse, retaining heat to keep the temperature of the Earth stable and hospitable for life at an average temperature of 60ºF. Carbon dioxide (CO_2) is the most prolific of these gases. Other contributing gases include methane (CH_4), nitrous oxide (NO_2), ozone (0_3) and halocarbons. Without the natural warming effect of these gases the average surface temperature of the Earth would be around 14ºF.

Figure (1) The Greenhouse Gas Phenomenon



Source: US Environmental Protection Agency

However, recently elevated concentrations of these gases in the atmosphere have had a de-stabilizing effect on the global climate, fueling the phenomenon commonly referred to as global warming. The global average surface temperature increased during the 20th century by about 1°F. According to NASA scientists, the 1990s were the warmest decade of the century, and the first decade of the 21st century is well on track to be another record-breaker. The years 2002, 2003, 2004 and 2005, along with 1998, were the warmest five years since the 1890s, with 2005 being the warmest year in over a century.

Scientific Facts and Projections:

- The atmospheric concentration of carbon dioxide (CO_2) during the last two decades has increased at the rate of 0.4% every year.
- Current CO_2 concentrations are higher than they have been in the last 420,000 years, and according to some research, the last 20 million years.
- About three-quarters of the CO_2 emissions produced by human activity during the past 20 years are due to the burning of fossil fuels.

Source: The Intergovernmental Panel on Climate Change

The climate and the atmosphere do not react in a linear fashion to increased greenhouse gases. That is to say that you cannot simply predict the specific degree of warming that each ton of carbon dioxide emitted from a power plant or a vehicle's tailpipe will cause. The Earth's climate has a number of feedback loops and tipping points that scientists fear will accelerate global warming beyond the rate at which it is currently occurring. For example, as CO_2 emissions have increased in recent human history, the oceans have been absorbing a significant portion of these gases, but as the oceans become more permeated with CO_2, scientists anticipate they will reach a saturation point, after which each ton of anthropogenically emitted CO_2 will have a more substantial impact.[5] Another example of this compounding can be found in the polar ice caps. Ice is highly reflective and acts effectively like a giant mirror, reflecting the sun's rays back into space. As the planet warms and some of this ice melts away, a darker land or ocean surface is revealed. This darker surface tends to absorb more heat, accelerating the speed at which the planet warms with each ton of greenhouse gas emitted. As these examples illustrate, the stakes are high, and there is no time to lose in the fight against global warming.

1.2 Effects & Impacts of Climate Change

Global Impacts

In addition to causing an increase in average global surface temperature, rising levels of greenhouse gases have a destabilizing effect on a number of different micro-climates, conditions and systems. According to the Intergovernmental Panel on Climate Change, surface temperatures are on course to increase by between 2.5 and 10.5ºF by the year 2100, with regions in the northern parts of North America and Asia heating by 40% above the mean increase.[6] The increase in the temperature of the oceans is projected to accelerate the water cycle, thereby increasing the severity and rate of both storms and drought, which, along with decreased snow pack, could disrupt ecosystems, agricultural systems and water supplies.

Snow cover has decreased by 10% in the last forty years. Average sea levels have raised between 1/3 and 2/3 of a foot over the course of the 20th century and are projected to rise by at least another 1/3 of a foot and up to almost three feet by the year 2100. These coastal infringements on such a large scale could lead to not only significant environmental and ecosystem disturbances, but also major population displacement and economic upheaval.[7]

Local Impacts

While climate change is a global problem influenced by an array of interrelated factors, climate change is also a local problem with serious impacts foreseen for California, the Bay Area and Emeryville.

***Sea level rise*:** According to the Union of Concerned Scientists, the sea level in the State of California is expected to rise up to 12 inches of the next hundred years. The Pew Center on Climate Change has reported that this would result in the erosion of beaches, bay shores and river deltas, marshes and wetlands and increased salinity of estuaries, marshes, rivers and aquifers.[8]

[5] Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report: "Climate Change 2001: The Scientific Basis."
[6] Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report: "Climate Change 2001: The Scientific Basis."
[7] Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report: "Climate Change 2001: The Scientific Basis."
[8] Neumann, James E. for the Pew Center on Global Climate Change. "Sea Level Rise & Global Climate Change: A Review of Impacts to the US Coasts." February 2000.

This increased salinity has the potential to damage or destroy crops in low-lying farmlands. Infrastructure at or near sea level, such as harbors, bridges, roads and even the San Francisco International and Oakland International Airports are at risk of damage and destruction.

The San Francisco Bay Area Conservation Commission has modeled the impact of a sea level rise of 3 feet (approx 1 meter) on the San Francisco Bay Area. As shown in Figure (2), areas such as the Oakland Airport would be under water as well parts of Alameda, San Leandro, Hayward, Union City, Fremont and Newark, including sections of Interstate 880.

Figure (2) San Francisco Bay Area Land areas Affected by a 1-meter Sea Level Rise

Source: San Francisco Bay Area Conservation Commission

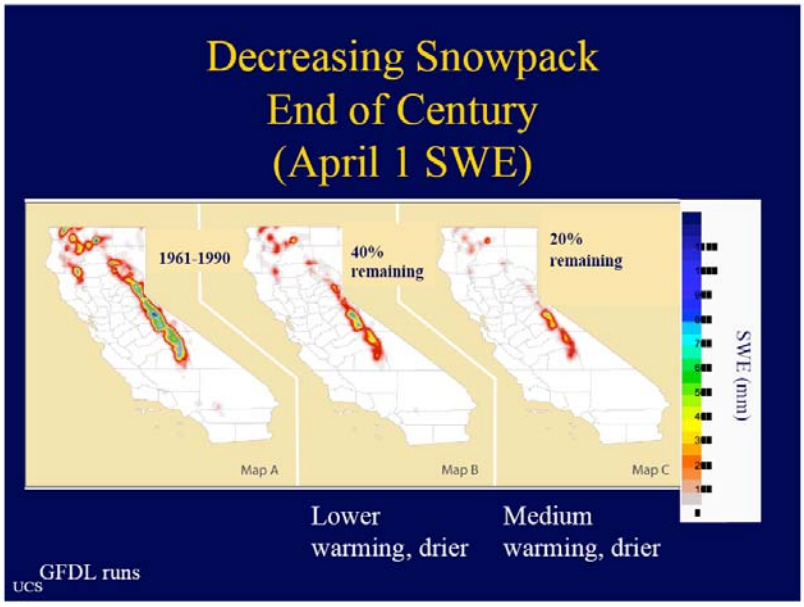
***Natural disasters*:** Climate models predict a 4ºF temperature increase in the next 20 to 40 years, with an increase in the number of long dry spells, as well as a 20-30% increase in precipitation in the spring and fall. More frequent and heavier precipitation cause flooding and mudslides, which would incur considerable costs in damages to property, infrastructure and even human life. Heavy rains during the winter of 2005 offer a glimpse of the potential costly and disruptive effects of such precipitation.

In addition, the increase of wildfires due to continued dry periods and high temperatures is another expected impact of continued climate change. In these conditions, fires burn hotter and spread faster. During 2003, there were 14 reported fires in California which were enhanced due to Santa Ana winds and very low levels of humidity. The estimated damage costs were over $2 Million.

Impacts on water: Water quality and quantity are also at risk as a result of changing temperatures. With warmer average temperatures, more winter precipitation will fall in the form of rain instead of snow, shortening the winter snowfall season and accelerating the rate at which the snowpack melts in the spring. Not only does such snow melt increase the threat for spring flooding, it will decrease the Sierras' capacity as a natural water tower, resulting in decreased water availability for agricultural irrigation, hydro-electric generation and the general needs of a growing population.

The decrease in snow-pack is particularly relevant in the State of California and the Bay Area, as the Sierra snow-pack provides approximately 80% of California's annual water supply, and it is the origin of the Tuolumne River, the primary source of water for the San Francisco regional water system. Figure (3) was provided by the Union of Concern Scientists for the California Climate Action Team Report (2006).

Figure (3) Decreasing Snowpack in California



Source: Union of Concern Scientists

***Impacts on plants and vegetation*:** Native plants and animals are also at risk as temperatures rise. Scientists are reporting more species moving to higher elevations or more northerly latitudes in response. Increased temperatures also provide a foothold for invasive species of weeds, insects and other threats to native species. The increased flow and salinity of water resources could also seriously affect the food web and mating conditions for fish that are of both of economic and recreational interest to residents. In addition, the natural cycle of plant's flowering and pollination, as well as the temperature conditions necessary for a thriving locally adapted agriculture could be affected, with perennial crops such as grapes taking years to recover.

In California, the impacts of climate change on agriculture are estimated to be $30 billion by the Farm Bureau, mostly due to changes in chill hours required per year for cash crops.

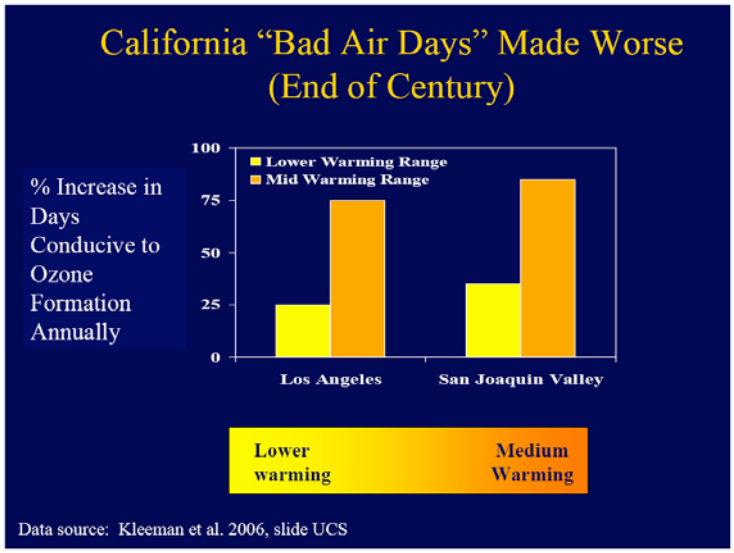
***Public health impact*:** Warming temperatures and increased precipitation can also encourage mosquito-breeding, thus engendering diseases that come with mosquitoes, such as the West Nile

Virus, a disease of growing concern in our region. Heat waves are also expected to have a major impact on public health and be a determinant factor of mortality. According to the IPCC (2004), the summer mortality rates will double by half by 2050 due to hot weather episodes.

Increased temperatures also pose a risk to human health when coupled with high concentrations of ground-level ozone and other air pollutants, which may lead to increased rates of asthma and other pulmonary diseases. Furthermore, anticipated increases in the number and severity of hot days place significant portions of the population, particularly the elderly, young, those already sick, and people who work outdoors, at risk for heat-stroke.

The incidence of bad air days in California's urban areas has increased, mostly in hot summer days. On long, hot, stagnant days, ground level ozone can build up to levels that violate federal and state health-based standards. In the summer of 2006, the Bay Area Air Quality Management District (BAAQMD) registered 11 Spare the Air days and exceeded the California 1-hour standard for ozone (set at 90 ppb) 18 times.

Figure (4) California Bad Air days



Source: Union of Concern Scientists

Given that climate change has local repercussions and effects on weather, water resources, ecosystems, public health, infrastructural stability and economic vitality, local governments have a vested interest in mitigating the amount of greenhouse gases being produced by their communities.

1.3 Action Being Taken on Climate Change

International Action

As evidence of climate change has mounted, groups at the international, federal, state and local level have responded with ways to confront the impending threat. The United Nations Framework Convention on Climate Change (UNFCC) leads international efforts to investigate and combat climate change. Recognizing the problem of potential global climate change, the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) established the Intergovernmental Panel on Climate Change (IPCC) in 1988 to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk associated with human-induced

climate change, its potential impacts and options for adaptation and mitigation, releasing it's most recent assessment in 2007.[9]

In 1997, 10,000 international delegates, observers and journalists gathered in Kyoto, Japan to participate in the drafting and adoption of the Kyoto Protocol, requiring industrialized nations to reduce their collective greenhouse gas emissions 5.2% below 1990 levels. As of January 2007, 162 countries have ratified the Protocol, with the United States and Australia most notably absent from the list. Additionally, since 1995 the annual Conference of the Parties (COP) has met to discuss action and implementation to combat climate change, with the most recent COP, COP-12, being held in Nairobi in 2006.

State and Federal Action

Though adequate attention and action related to combating climate change has been lacking at the federal level, California has taken significant steps at the state level. California has been leading the charge on combating climate change through legislation:

Senate Bill 1078 Sher, 2002 – Established a Renewable Portfolio Standard requiring electricity providers to increase purchases of renewable energy resources by 1% per year until they have attained a portfolio of 20% renewable resources.

Assembly Bill 1493 Pavley, 2002 – Requires the State Air Resources Board to develop and adopt regulations that achieve the maximum feasible reduction of greenhouse gases from vehicles primarily used for non-commercial transportation by January 2005.

Senate Bill 1771 Sher, 2000 – Requires the California Energy Commission (CEC) to prepare an inventory of the state's greenhouse gas emissions, to study data on global climate change, and to provide government agencies and businesses with information on the costs and methods for reducing greenhouse gases. It also established the California Climate Action Registry to serve as a certifying agency for companies and local governments to quantify and register their greenhouse gas emissions for possible future trading systems.

AB 32 Núñez & Pavley, 2006 – Institutes a mandatory limit on greenhouse gas emissions -- reducing emissions in California to 1990 levels by the year 2020, or 25% below forecasted levels. The bill also directs the California Air Resources Board (CARB) to establish a mandatory reporting system to track and monitor emission levels and requires CARB to develop various compliance options and enforcement mechanisms.

On June 1, 2005, Governor Schwarzenegger signed Executive Order #S-3-05 establishing a greenhouse gas reduction target of reducing emissions to 2000 levels by 2010, to 1990 levels by 2020 and 80 percent below 1990 levels by 2050. In April 2006, the California Climate Action Team released its Report to Governor Schwarzenegger and the State Legislature, outlining recommendations and strategies to achieve those reductions.

Local Action

A great deal of work is being done at the local level on climate change as well. ICLEI—Local Governments for Sustainability has been a leader both internationally and domestically for more than ten years, representing over 770 local governments around the world. ICLEI was launched in the United States in 1995 and has grown to more than 230 cities and counties providing national leadership on climate protection and sustainable development. In June 2006, ICLEI launched the California Local Government Climate Task Force as a formal mechanism to provide ongoing input and collaboration into the State of California's climate action process. ICLEI also works in conjunction with the U.S. Conference of Mayors to track progress and implementation of the U.S. Mayors Climate Protection Agreement, launched in 2005, which more than 376 mayors have

[9] Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report: "Climate Change 2007"

signed to date pledging to meet or beat the Kyoto Protocol emissions reduction target in their own communities. By the end of 2006, Alameda County mayors from Emeryville, San Leandro, Oakland, Pleasanton, Newark, Hayward, Freemont, Dublin, Berkeley, and Albany signed the U.S. Mayors Climate Protection Agreement.

Climate Protection Efforts by the City of Emeryville

The City of Emeryville has taken several actions on Climate Change in recent years:

On September 7 1999, Council Member Harper asked and received the blessing of the Emeryville City Council to sign onto the "Mayor and Local Official Statement on Global Warming" through the organization "Cities for Climate Protection."

On June 5, 2005, in San Francisco at the United Nations World Environment Day proceedings, the City of Emeryville signed on as a charter member of the United Nations World Environmental Accords - the smallest city in the world to do so. The Accords ask the participating jurisdictions to take one of the 21 action steps each year; the Cities will be evaluated on their voluntary actions in 2012 by the United Nations at a follow-up conference. One of the key action steps of the Accords is to set a goal of reducing green house gas emissions by 25% by 2030 and developing a system to track Greenhouse Gas (GHG) emissions.

Emeryville has already taken many steps toward increasing energy efficiency, reducing air pollution, and reducing solid waste. Examples include:

- Brownfield Redevelopment - Extensive programs since 1996 resulting in urban in-fill projects and reducing the need for urban sprawl. As of 2008 this redevelopment created: 2,290 new residential units for 3,500 residents of which 719 were affordable; and 3.6 million square feet of new commercial space and 800,000 square feet of new retail space creating 8,400 new jobs
- Establishment of the EPA-award-winning Emery-Go-Round: in 2007 shuttled 1.2 million riders between the MacArthur BART station and the City and growing 8% per year.
- Requiring new City Buildings and Landscapes to be LEED Silver Certified and Bay-Friendly Verified
- Reducing building permit fees for single family home solar installations.
- Installing Solar PV panels on the Civic Center roof.
- Requiring vegetated stormwater treatment in all new developments, cleaning the bay, reducing the heat island effect in the City, reducing energy use for cooling and increasing CO2 uptake by plants.
- Increasing Street tree planting standards for new developments ensuring the long-term health of more trees in the City.
- Implementing environmental purchasing decisions such as switching to recycled content copy paper in many City buildings. This practice benefits the community by incentivizing business practices that conserve resources, reduce emissions, and reduce waste.
- Working with the Emeryville Chamber of Commerce to get 21 businesses in Emeryville to "Go Green" and become certified green businesses over since 2003.
- Working with "SmartLights" of the East Bay Energy Watch program to reduce energy use in the lighting of commercial properties in the City.
- Adopting StopWaste.Org's Multi-Family Green Building Guidelines which serve to reduce greenhouse gas emissions by keeping construction and demolition debris out of landfills and increasing energy efficiency in buildings.
- Converting traffic signal lights to more energy efficient LED lamps.
- Requiring new developments to rate their projects using the green building scoring

systems from StopWaste.Org and the United States Green Building Council (USGBC)

- Implementing residential food scrap recycling. Currently approximately 20% percent of households in the single family neighborhoods participate, thereby diverting 9 of tons of food scraps in 2006 from the landfill to a composting facility.
- Requiring landscapes in new developments and city projects to use locally produced compost and mulch partially made of feedstocks from municipal sources.
- Equipping the City Corporation Yard with motion occupancy sensors and energy efficient lighting. These steps save the City money, and reduce the emissions that cause global warming. The Senior Center also received rebate funds for the replacement of the old boiler. Other City facilities are also being considered for lighting retrofits.
- Installing Emeryville's first bike boulevard, adding more bike lanes and building the first phases of the Emeryville Greenway, an urban Rail-to-Trail project, encouraging more people to travel by bike and on foot reducing vehicle emissions.
- Educating the residents of Emeryville at each years Earth Day event in Temescal Creek Park about environmental issues that face the City and the planet.
- Adopting the "Eco Food-ware" ordinance requiring disposable food packaging to be recyclable or compostable for all food prepared in the City and reduce plastic litter washing out to the Bay and ocean.
- Working with the East Bay Green Corridor Partnership to increase the availability of green-collar jobs and green job training
- Starting in 2007, the City has contracted with California Youth Energy Services each summer to give local high school students energy conservation job skills and retrofit existing Emeryville homes with energy conserving devices.
- Joint Bio-Energy Institute - Partnering with UC Berkeley, the Lawrence Berkeley Laboratory and the City of Berkeley, Amyris and others creating 360 green jobs in Emeryville.

2. Emissions Inventory

2.1 Reasoning, Methodology & Model

The City of Emeryville's inventory was conducted by ICLEI in partnership with staff from the municipality. The purpose of the baseline emissions inventory is to determine the levels of greenhouse gas emissions that Emeryville emitted in its base year, 2004.

ICLEI's Cities for Climate Protection inventory methodology allows local governments to systematically estimate and track greenhouse gas emissions from energy and waste related activities at the community-wide scale and those resulting directly form municipal operations. The municipal operations inventory is a subset of the community-scale inventory.

Once completed, these inventories provide the basis for creating an emissions forecast and reduction target, and enable the quantification of emissions reductions associated with implemented and proposed measures.

2.1.1 ICLEI's Emissions Analysis Software

To facilitate local government efforts to identify and reduce greenhouse gas emissions, ICLEI developed the Clean Air and Climate Protection (CACP) software package with Torrie Smith Associates. This software estimates emissions derived from energy consumption and waste generation within a community. The CACP software determines emissions using specific factors (or coefficients) according to the type of fuel used. Emissions are aggregated and reported in terms of carbon dioxide equivalent units, or CO_2e. Converting all emissions to carbon dioxide equivalent units allows for the consideration of different greenhouse gases in comparable terms. For example, methane is twenty-one times more powerful than carbon dioxide in its capacity to trap heat, so the model converts one ton of methane emissions to 21 tons of CO_2e.

The emissions coefficients and methodology employed by the software are consistent with national and international inventory standards established by the Intergovernmental Panel on Climate Change (1996 Revised IPCC Guidelines for the Preparation of National GHG Emissions Inventories), the U.S. Voluntary Greenhouse Gas Reporting Guidelines (EIA form1605), and, for emissions generated from solid waste, the U.S. EPA's Waste Reduction Model (WARM).

The CACP software has been and continues to be used by over 250U.S. local governments to reduce their greenhouse gas emissions. However, it is worth noting that, although the software provides City of Emeryville with a sophisticated and useful tool, calculating emissions from energy use with precision is difficult. The model depends upon numerous assumptions, and it is limited by the quantity and quality of available data. With this in mind, it is useful to think of any specific number generated by the model as an approximation rather than an exact value.

2.1.2 Inventory Sources and Data Collection Process

An inventory of greenhouse gas emissions requires the collection of information from a variety of sectors and sources. For community electricity and natural gas data, ICLEI consulted Pacific Gas & Electric Company (PG&E) and Alameda Power & Telecom[10]. The Metropolitan Transportation Commission (MTC), Bay Area Air Quality Management District (BAAQMD), and Bay Area Rapid Transit (BART) served as sources of transportation data. Solid waste data was gathered from StopWaste.Org, Waste Management, Inc., Alameda County Industries, Republic Services, Inc. and the U.S. Environmental Protection Agency (U.S. EPA). City of Emeryville staff person, Peter Schultze-Allen, was instrumental in providing data on municipal operations.

[10] Exclusively for the City of Alameda

These data were entered into the software to create a community emissions inventory and a municipal emissions inventory. The community inventory represents all the energy used and waste produced within Emeryville and its contribution to greenhouse gas emissions. The municipal inventory is a subset of the community inventory, and includes emissions derived from internal government operations.

There are two main reasons for completing separate emissions inventories for community and municipal operations. First, the government is committed to action on climate change, and has a higher degree of control to achieve reductions in its own municipal emissions than those created by the community at large. Second, by proactively reducing emissions generated by its own activities, the City of Emeryville government takes a visible leadership role in the effort to address climate change. This is important for inspiring local action in Emeryville, as well as for inspiring other communities.

Emeryville's inventory is based on the year 2004. When calculating Emeryville's emissions inventory, all energy consumed in Emeryville was included. This means that, even though the electricity used by Emeryville residents is produced elsewhere, this energy and emissions associated with it appears in Emeryville's inventory. The decision to calculate emissions in this manner reflects the general philosophy that a community should take full ownership of the impacts associated with its energy consumption, regardless of whether the generation occurs within the geographical limits of the community.

2.2 Alameda County Inventory Results

The results for the Alameda County GHG emissions inventory are shown in the following table (2) and figure (5):

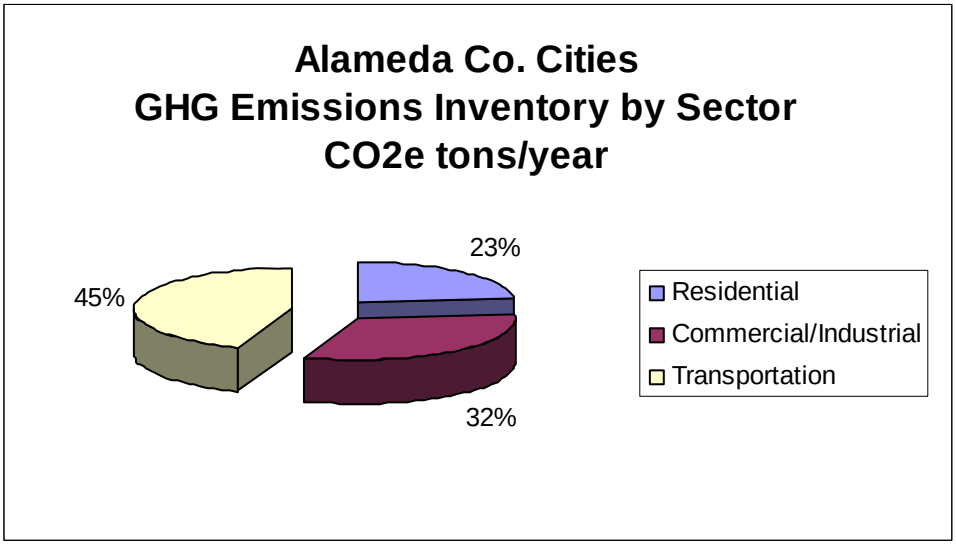
Table (2) GHG Emissions Inventory Results in Alameda County

GHG Emissions Community Inventory Alameda County, CA[1]	**Total CO_2e short tons/year**
	Baseline year[2]
Residential	1,316,481
Commercial/Industrial	1,853,776
Transportation	2,540,136
TOTAL	5,710,393
Households	356,707
Population	974,905
PERCAPITA GHG Emissions (Per capita CO_2e tons/year)	5.86

[1] The above data includes 10 cities (Alameda City, Albany, Berkeley, Emeryville, Hayward, Newark, Oakland, Piedmont, San Leandro and Union City).

[2] The Baseline year is 2005 for all cities, except for Albany and Emeryville which inventoried 2004 emissions. For the presentation of results, data for all cities is included.

Figure (5) GHG Emissions Inventory Results in Alameda County



Source: CACP output

Table (2) and Figure (5) above shows the County's total greenhouse gas emissions from all major sources for the year 2005. The year 2005 was the baseline for all cities except for Albany and Emeryville who used 2004. The County of Alameda is emitting approximately 5,710,393 tons of CO_2e from the residential, commercial/industrial, and transportation sectors. Burning fossil fuels in vehicles and for energy use in buildings and facilities is a major contributor to the County's greenhouse gas emissions. Fuel consumption in the transportation sector is the single largest source of emissions, contributing 45% of total emissions. The residential and commercial/industrial sectors represent emissions that result from electricity and natural gas used in both private and public sector buildings and facilities.

2.3 Emeryville Inventory Results

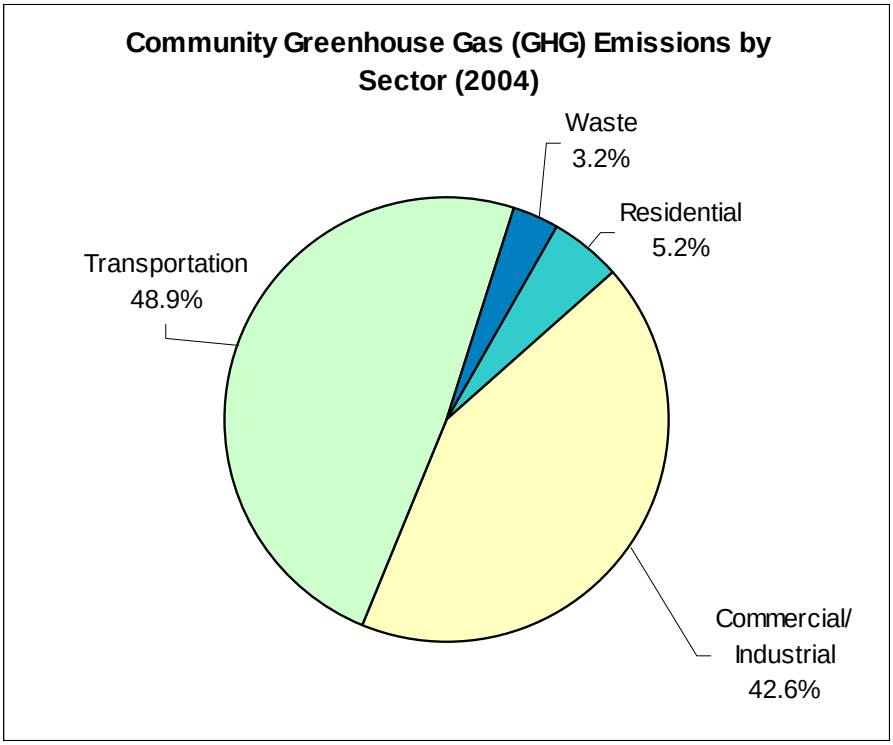
The results below represent the City of Emeryville's completion of the first milestone of ICLEI's CCP campaign. The inventory was first done in 2006 and then updated with Highway emissions in August of 2008. The inventory described below includes those highway emissions.

2.3.1 Community Emissions Inventory Summary – 2004

Table (3) Community Emissions Summary

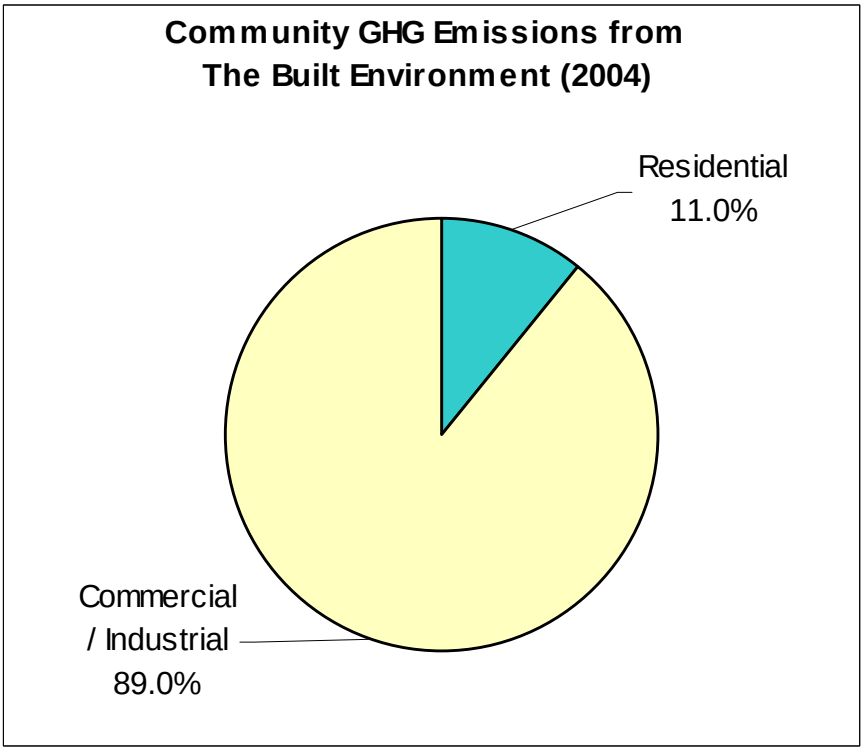
2004 Community Emissions by Sector	Residential	Commercial/ Industrial	Transportation	Waste	TOTAL
CO_2e (metric tons)	9,380	76,204	87,447	5,801	178,832
Percentage of Total CO_2e	5.2%	42.6%	48.9%	3.2%	100.0%
Energy Use (MMBtu)	160,562	1,267,105	262,451	0	1,690,118

Figure (6) Community Emissions by Sector



2.3.2 Community Emissions Inventory Detail – 2004

Figure (7) Community Emissions – Built Environment

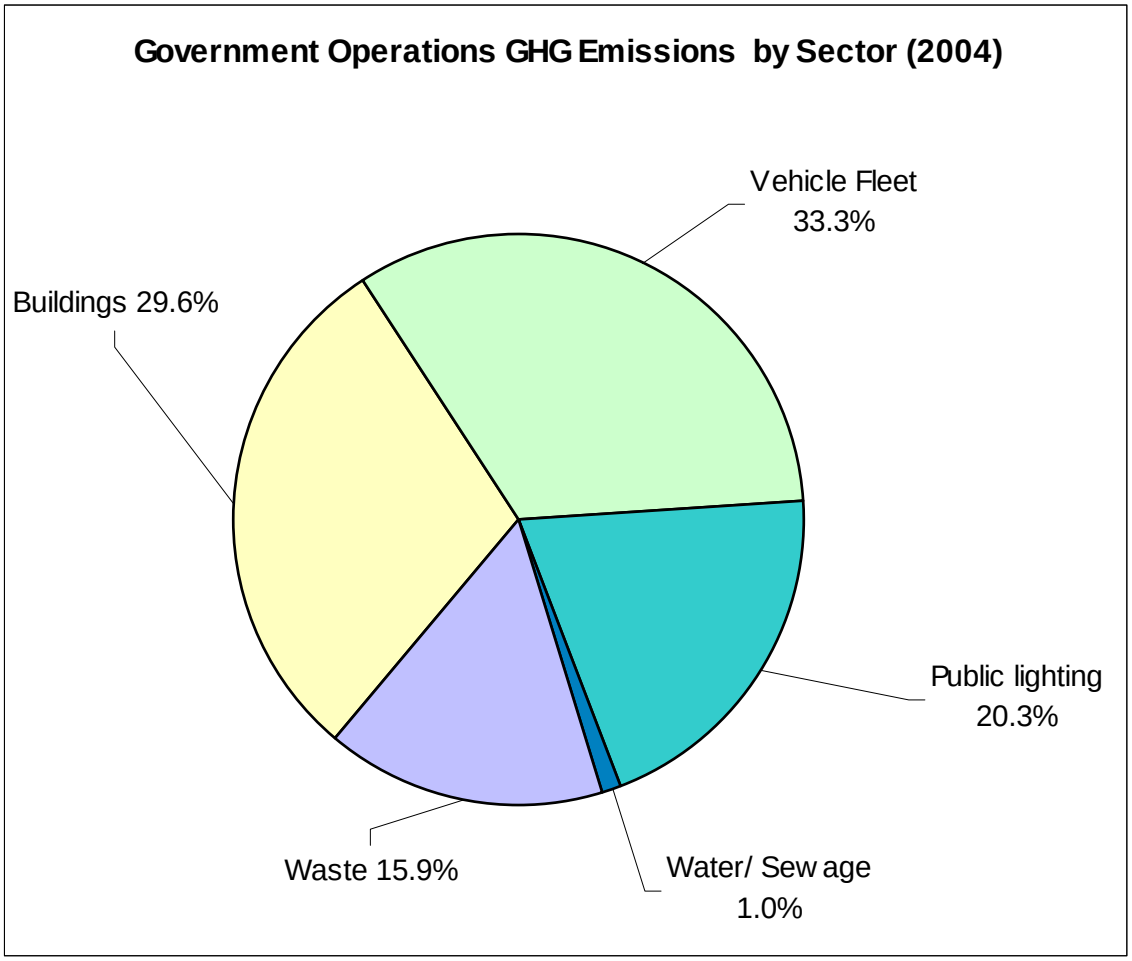


2.3.3 Government Emissions Inventory Summary 2004

Table (4) Government Emissions

Government Emissions 2004	Buildings	Vehicle Fleet	Public Lighting	Water/ Sewage	Waste	TOTAL
CO2e (metric tons)	395	444	271	13	212	1,335
% of Total CO2e	29.6%	33.3%	20.3%	1.0%	15.9%	100.0%
MMBtu	6,633	5,713	4,137	195	-	16,678
Cost ($)	$169,608.00	$118,974.00	$136,974.00	$7,801.00	-	433,357

Figure (8) Government Emissions by Sector



3. Forecast for Greenhouse Gas Emissions – 2020

Table 5 shows the projected new development in the City of Emeryville (taken from the City's draft General Plan - Land Use section.) The row headings are described below:

A. Approved Projects. This includes the various projects that have been approved or are under construction as of November 2007. This development includes 907 housing units and 1.3 million square feet of non-residential space.

B. Gross New Development. This value results from application of average assumed intensities to change areas. Approximately 2,930 housing units and 3.0 million square feet of non-residential space will be added.

C. Existing Development Lost Due to Redevelopment. This value reflects existing underutilized properties that will be replaced by new uses.

D. Net New Development. This reflects the total of the three above categories, and represents the expected development during the life of the General Plan.

E. Existing Development. This reflects existing development, as of November 2007.

F. City at 2030. Totaling net new development and existing development results in the General Plan development potential at 2030. This will result in an increase of approximately 3,800 housing units, a 70 percent increase in the existing population of 9,727 to 16,500, and 2.5 million square feet of total non-residential space, an increase of 21% over 2007 levels.

Table (5) General Plan Development Potential at 2030, by Land Use (draft)

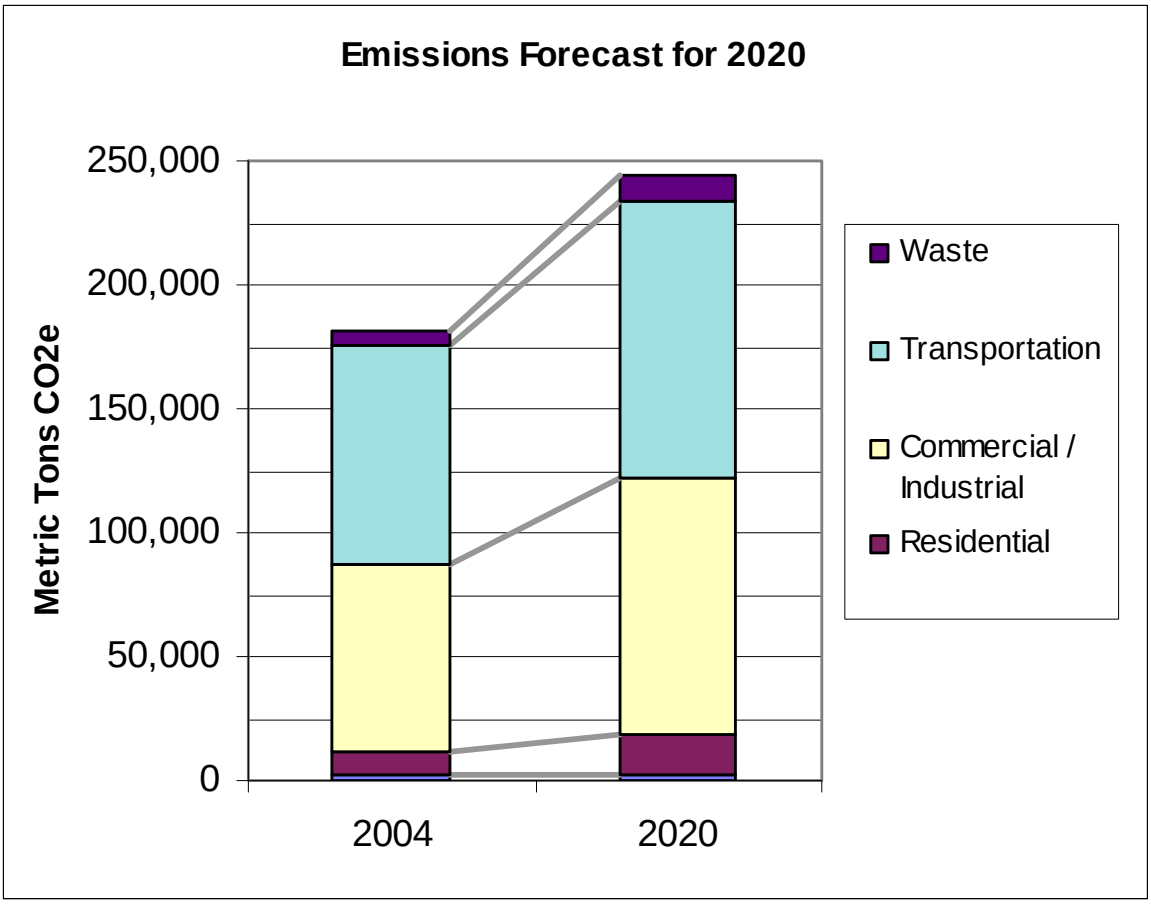
	Residential (units)	Retail (SF)	Hotel (SF)	Office[1] (SF)	Industrial (SF)
A. Approved Development	907	34,461	0	1,313,000	0
B. Gross New Development	2,930	1,075,400	324,600	1,569,700	76,200
C. Existing Lost Due to Redevelopment	70	468,598	14,375	509,740	855,377
D. Net New Development (A+B-C)	3,767	641,263	310,225	2,372,960	-779,177
E. Existing Development	5,988	2,441,660	464,500	4,852,118	4,132,675
F. City at 2030 (D+E)	9,755	3,082,923	774,725	7,225,078	3,353,499

[1]Office includes R&D development.

From 2004 to 2020, under a business-as-usual scenario, the City of Emeryville's emissions will grow by approximately 32.6% from 178,832 to 237,101 metric tons CO2e[11]. To illustrate the potential emissions growth based on projected trends in energy use, driving habits, job growth, and population growth from the baseline year going forward, ICLEI conducted an emissions forecast for the year 2020. Figure 9 and Table 6 show the results of the forecast. A variety of different reports and projections were used to create the emissions forecast.

[11] Transportation growth rates calculated for this forecast assume a base year of 2005, and would be slightly different from 2004.

Figure (9) Community Emissions Forecast



Residential Forecast Methodology

For the residential sector, ICLEI calculated the compounded annual population growth rate[12] between 2005 and 2020, using population projections from Emeryville's draft General Plan. This growth rate (3.444%) was used to estimate average annual compound growth in energy demand. From the Emeryville General Plan, ICLEI estimated that the City's population will be 13,300 in 2020[13].

Commercial / Industrial Forecast Methodology

Analysis contained within "California Energy Demand 2008-2018: Staff Revised Forecast[14]," a report by the California Energy Commission (CEC), shows that commercial floor space and the number of jobs have closely tracked the growth in energy use in the commercial sector. Using job growth projections from the draft Emeryville General Plan, ICLEI calculated that the compounded annual growth in energy use in the commercial sector between 2005 and 2020 will be 1.99%.[15]

[12] Compounded annual growth rate= ((2020 population/2005 population)^(1/15))-1

[13] The General Plan provides population predictions for 2030. To estimate 2020 population, ICLEI used 2000 Census data and assumed an equal growth rate every five years between 2000 and 2030.

[14] http://www.energy.ca.gov/2007publications/CEC-200-2007-015/CEC-200-2007-015-SF2.PDF

[15] The Emeryville General Plan states that 10,000 new jobs will be added by 2030. ICLEI estimated the 2007 number of jobs by assuming a constant growth between 2005 and 2010 from ABAG jobs forecast data and added 10,000 to

Transportation Forecast Methodology

For the transportation sector, projected growth in energy demand was obtained from the CEC 2008 energy demand forecast referenced above. The recently passed federal Corporate Average Fuel Economy standards and the state of California's pending tailpipe emission standards could significantly reduce the demand for transportation fuel in Emeryville. An analysis of potential fuel savings from these measures at a scale that would be useful for the purpose of this report has not been conducted, nor would such an analysis produce a true business-as-usual estimation. Regardless of future changes in the composition of vehicles on the road as a result of state or federal rulemaking, emissions from the transportation sector will continue to be largely determined by growth in vehicle-miles-traveled (VMT). In their report, "Transportation Energy Forecasts for the 2007 Integrated Energy Policy Report," the CEC projects that on-road VMT will increase at an annual rate of 1.51% per year through 2020[16]. This is the number that was used to estimate emission growth in the transportation sector for the Emeryville forecast.

Waste Forecast Methodology

As with the residential sector, the primary determinate for growth in emissions in the waste sector is population. Therefore, the compounded annual population growth rate for 2005 to 2020, which is 3.444%[17] (as calculated from the draft Emeryville General Plan), was used to estimate future emissions in the waste sector.

Table 6 – *Community Emissions Growth Projections by Sector*

Community Emissions Growth Forecast by Sector	2004	2020	Annual Growth Rate	Percent Change from 2004 to 2020
Residential	9,380	15,587	3.444%	66.2%
Commercial / Industrial	76,204	102,407	1.990%	34.4%
Transportation (incl. 2005 State Hwy data)	87,447	109,467	1.509%	25.2%
Waste	5,801	9,640	3.444%	66.2%
TOTAL	**178,832**	**237,101**	--	**32.6%**

As Table 6 shows, emissions from the residential and waste sectors will experience a 66.2% increase. Emeryville can dramatically reduce these emissions by ensuring energy and water efficiency standards are met in new residential developments and promoting recycling and composting across the City.

The Municipal operations of the City are not expected to grow in any significant manner, so the business as usual emissions are projected to remain roughly the same. This is reflected in Table 7.

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estimate 2030 jobs (30,668). This was then prorated in the same manner as population projections to estimate 2020 jobs (27,065).

[16] Report available at: http://www.energy.ca.gov/2007publications/CEC-600-2007-009/CEC-600-2007-009-SF.PDF. Compounded Annual growth rate for 2005-2020 is calculated from Table 4 on page 12. In light of recent fuel cost increases, the calculation assumes high fuel cost scenario.

[17] Ibid

4. Greenhouse Gas Emissions Reduction Target

A reduction target provides a tangible goal for Emeryville's emissions reduction efforts. Our emissions reduction target represents a percentage by which the community aims to decrease emissions, below the 2004 baseline, by 2020.

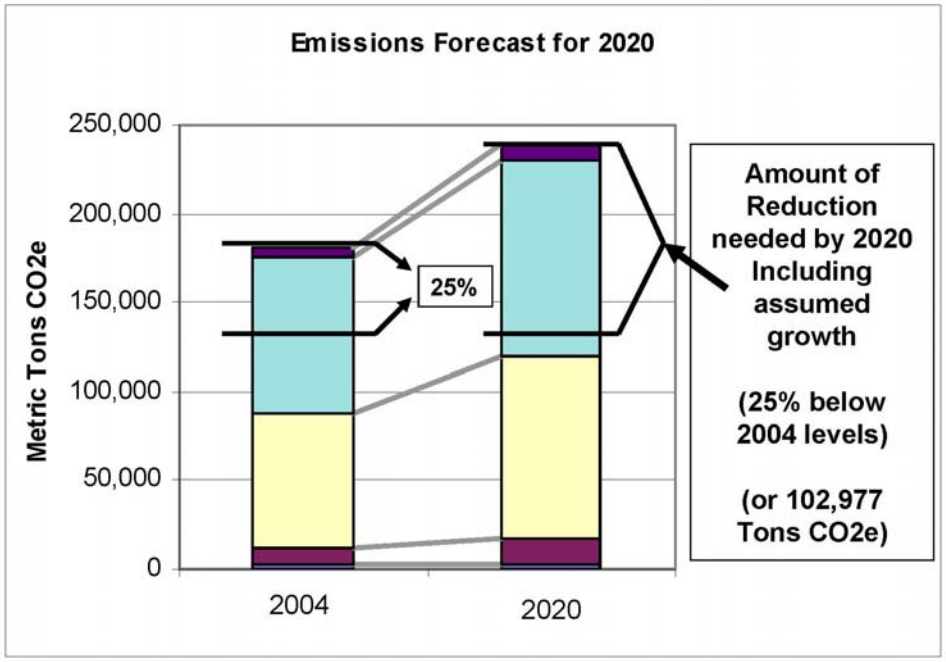
Many factors were considered when selecting Emeryville's reduction target. We strove to choose a target that is both aggressive and achievable given local circumstances. Emeryville's residential and commercial redevelopment is occurring at a rapid level, which provides the City with both challenges and opportunities for climate change actions.

Table (7) Emeryville Emissions Summary

	Community-wide	Government Operations
Base year	2004	2004
Quantity of CO_2e emissions in base year (tons)	178,832	1,335
Target year	2020	2020
Business-as-usual projection of CO_2e emissions in 2020 (tons)	237,101	1,335
Percent CO_2e reduction targeted by target year relative to base year (%)	25%	25%
Quantity of CO_2e reduction targeted relative to base year (tons)	102,977	284

Source: CACP Model Output

Figure (10) Emission Reduction Target Summary



5. Summary of Existing Emissions Reduction Measures

Table (8) Emeryville's Emissions Summary

	Community Analysis	Government Operations Analysis
Base year	2004	2004
Quantity of CO_2e emissions in base year (tons)	178,832	1,335
Target year	2020	2020
Business-as-usual projection of CO_2e emissions in 2020 (tons)	237,101	1,335
Percent CO_2e reduction targeted by target year relative to base year (%)	25%	25%
Quantity of CO_2e reduction targeted relative to base year (tons)	102,977	333
Quantity of CO_2e reduction achieved to date (tons)	0[1]	50[2]
Percent of CO_2e reduction target achieved to date (%)	0%[1]	7%[2]
Quantity of CO_2e reduction pending to reach target (tons)	102,977	284

Source: CACP Model Output

[1] Until the next emissions inventory is performed, it is not possible to accurately estimate the community emission reductions to date.

[2] The Municipal emission reductions to date were estimated from the new programs that have occurred since the end of 2004: solar pv system on City Hall, the police bike patrol program, the lighting retrofit at the Corp Yard, the boiler replacement at the Senior Center, compost and recycling improvements at City facilities and new fleet vehicles with better emissions.

6. Proposed Emissions Reduction Measures & Policies

Based on careful consideration of the emissions reductions needed to achieve our stated targets, the distribution of emissions revealed in our emissions inventory, existing priorities and resources, and the potential costs and benefits of various potential emissions reduction projects, Emeryville has identified a set of emissions reduction measures that should be set into motion as soon as possible. An implementation table prioritizing the measures with costs and scheduling for each measure is attached as Exhibit A. The actions are divided into the following sectors/measure types: transportation, energy efficiency, renewable energy, and solid waste management[18]. Within each of these categories, the measures are further divided into the measures that affect community-wide emissions and measures that affect the emissions that result from municipal operations.

Summary of Proposed Actions:

Community-Wide	Affected Sector
Increase Transit Oriented Development	New Development Projects
Adopt a Green Building and Bay-Friendly Ordinance	New Development Projects
Enhance Transportation Demand Management Conditions	New Development Projects
New Pedestrian, Cycling and Transit Programs & Incentives	All Sectors
Increase Transit Service and Ridership	All Sectors
Commercial and Residential Energy Conservation Ordinances	Existing Buildings and Homes
Develop and Incentivize Local Renewable Energy Production	All Sectors
Conserve Potable Water and Develop Rainwater Usage	All Sectors
Reduce 2004 Landfilled Waste Tonnage by 50% by 2020	All Sectors

Government Operations

GB/BFL for buildings and landscapes

Fleet changes – fuel and vehicle types

Reduce 2004 Landfilled Waste Tonnage by 50% by 2020

Environmentally Preferable Purchasing

Alternative Transportation Incentives/Initiatives

The emissions that result from municipal facilities and operations account for less than 1% percent of Emeryville community-wide emissions. That being said, measures taken to reduce municipal emissions show that the city's elected officials and staff are committed to action on climate change and to inspiring action in both our community and neighboring communities. Emeryville is proud of the emissions reduction efforts implemented to date and is committed to building on those efforts by increasing fleet fuel efficiency, reducing solid waste, and increasing energy efficiency and conservation in municipal buildings.

[18] Waste Management is used in the broader sense to include, waste reduction, recycling, composting and final disposal activities.

6.1 Community-wide Energy and Transportation/Land-Use Measures

Table (9) Proposed Community-wide Energy & Transportation/Land-use Measures
(Source – CAPPA software from ICLEI and WARM model from EPA)

Measure ID#	Measure	CO2e (metric tons)	% towards goal
C58	Transit Oriented Development	17,640	18.00%
C16	Require Green Building for New Construction	10,511	10.73%
C29	Energy Efficiency Education Targeted at Residents	7,514	7.67%
C32	Water Conservation Ordinance	5,341	5.45%
C30	Promote Green Building Through Loans & Incentives	5,256	5.36%
C44	Education on Low-carbon Transportation Options	3,985	4.07%
C23	Require Energy Efficiency Retrofit at Time of Sale	3,757	3.83%
C17	Strict Commercial Energy Code	3,504	3.58%
C22	Energy Efficiency Retrofits of Existing Facilities	3,504	3.58%
C47	Bus Rapid Transit for Emery-Go-Round and AC Transit	3,466	3.54%
C28	Energy Efficiency Education Targeted at Business	3,325	3.39%
C38	Reflective Roofing	2,346	2.39%
C52	Expand Carshare	2,317	2.36%
C18	Strict Residential Energy Code	2,254	2.30%
C19	Offer Loans for Residential Energy Efficiency Improvements	2,254	2.30%
C10	High Efficiency Water Heaters	2,185	2.23%
C21	Energy Efficient Affordable Housing	1,503	1.53%
C36	Low-Maintenance Landscaping	1,480	1.51%
C57	Provide Free High School Bus Passes	1,002	1.07%
C36	Lighting Occupancy Sensors	958	0.98%
C20	Low-income Home Weatherization	881	0.90%
C27	Efficient Lighting Retrofits - T12 lamps to T-8 lamps	821	0.84%
C11	Increase Chiller Efficiency	817	0.83%
C31	Green Business Programs	665	0.68%
C39	Install Solar Photovoltaic (PV) Energy	656	0.67%
C51	Increase BART & AMTRAK Ridership	639	0.65%
C5	Energy Efficient Refrigerators	556	0.57%
C46	Increase Emery-Go-Round Ridership	556	0.57%
C48	Parking Cashout	450	0.46%
C40	Install Solar Hot Water through incentives	390	0.40%
C34	Water Saving Shower Heads	377	0.39%
C1	Energy Efficient Computers	365	0.37%
C2	Energy Efficient Computer Monitors	340	0.35%
C13	HVAC Fan Upgrades	331	0.34%
C14	HVAC Maintenance Tune-ups	317	0.32%
C50	Increase AC Transit Ridership	278	0.28%
C56	Provide Bicycles for Daily Trips	262	0.27%
C8	Energy-Efficient Dish Washers	252	0.26%
C45	Bicycling Paths and Facilities	243	0.25%

C12	Increase Boiler Efficiency	222	0.23%
C6	Energy Efficient Vending Machines	199	0.20%
C37	Green Roofs	196	0.20%
C53	Promote Carpooling and Vanpooling	187	0.19%
C15	Switch Electric Heat to Natural Gas	185	0.19%
C9	Efficient Clothes Washers	172	0.18%
C54	Promote Telecommuting	172	0.18%
C60	Parking and Lane Incentives for Hybrid Vehicles	164	0.17%
C59	Use Hybrid Vehicles - (all sectors)	164	0.17%
C4	Energy Efficient Copiers	150	0.15%
C63	Increase Urban Forest	126	0.13%
C49	Walking Friendly Environments	122	0.12%
C42	Electric Vehicle Charging Stations on Parking Structures	119	0.12%
C61	Use Smaller Fleet Vehicles	92	0.09%
C43	Integrate Bicycles and Transit	81	0.08%
C3	Energy Efficient Printers	74	0.08%
C25	Energy Efficient Exit Signs	54	0.06%
C62	Plant Trees to Shade Buildings	41	0.04%
C33	Water Saving Faucets	38	0.04%
C24	Compact Fluorescent Light Bulb (CFL) Distribution	35	0.04%
C35	High Efficiency Toilets	25	0.03%
C7	Energy Efficient Water Coolers	24	0.02%
C41	Use Wind Energy	20	0.02%
	Sub Total from CAPPA Software	95,961	97.99%
	Waste Measures – See Section 6.3 below (WARM model)	16,766	
	TOTAL TONS REDUCED	112,727	

6.2 Government Energy and Transportation Measures

Table (10): Proposed Government Energy and Transportation Measures
(Source – CAPPA software from ICLEI and WARM model from EPA)

Measure ID #	Measure	CO2e (metric tons)	% of goal
G21	Use Solar Photovoltaic (PV) Energy	65.61	23.12%
G12	Require Green Building for New Construction	26.28	9.26%
G13	Energy Efficiency Retrofits of Existing Facilities	21.90	7.72%
G28	Increase BART & AMTRAK Transit Ridership by employees	16.80	5.92%
G32	Hybrid Vehicles - City Fleet	16.45	5.80%
G22	Use Solar Heat for Public Swimming Pool	15.74	5.55%
G36	Establish/Expand Recycling Programs	13.15	4.63%
G17	Lighting Occupancy Sensors	11.49	4.05%
G35	Fuel Efficient Vehicles for Parking Enforcement	10.55	3.72%
G18	Low-Maintenance Landscaping	9.87	3.48%

G27	Increase Emery-Go-Round Ridership by employees	7.31	2.58%
G25	Police on Bicycles	7.08	2.50%
G16	LED Traffic Signals	4.73	1.67%
G20	Reflective Roofing	4.69	1.65%
G26	Parking Cashout	4.50	1.58%
G8	Increase Chiller Efficiency	4.09	1.44%
G38	Plant Trees to Shade Buildings	4.07	1.44%
G19	Green Roofs	3.92	1.38%
G33	Use Smaller Fleet Vehicles	3.69	1.30%
G7	High Efficiency Water Heaters	3.64	1.28%
G29	Carsharing program for fleet vehicles	3.45	1.22%
G11	HVAC Maintenance Tune-ups	3.17	1.12%
G4	Energy Efficient Copiers	3.00	1.06%
G37	Reuse or Recycling of Construction Materials	2.98	1.05%
G23	Install Solar Hot Water	1.92	0.68%
G1	Energy Efficient Computers	1.83	0.64%
G2	Energy Efficient Computer Monitors	1.70	0.60%
G10	HVAC Fan Upgrades	1.65	0.58%
G3	Energy Efficient Printers	1.48	0.52%
G9	Increase Boiler Efficiency	1.11	0.39%
G14	Energy Efficient Exit Signs	1.09	0.38%
G15	LED Street Lights	1.05	0.37%
G5	Energy Efficient Refrigerators	0.93	0.33%
G30	Promote Telecommuting	0.86	0.30%
G34	Retire Old or Underused Fleet Vehicles	0.75	0.26%
G24	Bicycling Paths and Facilities	0.46	0.16%
G31	Provide Bicycles for Daily Trips	0.45	0.16%
G6	Energy Efficient Water Coolers	0.41	0.14%
	Sub Total from CAPPA Software	285	
	Waste Measures – see Section 6.4 below (WARM model)	50	
	TOTAL TONS REDUCED	335	

6.3 Community-wide Solid Waste Reduction Measures

Table (11): Proposed Community-wide Solid Waste Reduction Measures

Reduce Landfilled Waste in half by 2020 over 2004 levels by:
Increasing participation in commercial recycling/reuse programs for paper, cardboard, metal, glass and plastics – rigid and film.
Participating in StopWaste.Org's audit and technical assistance program
Encouraging businesses to participate in the County Green Business program
Increasing participation in residential recycling programs
Educating residents and businesses about the benefits of Bay-Friendly Landscaping and Gardening
Increasing participation in commercial and residential food waste collection program (for composting).
Revising franchise language as franchises are renegotiated to include language that maximizes diversion (see StopWaste.Org for best practices)
Considering incentives for waste reduction such as new rate structures for refuse and discards collection that credit diversion and allow for reduced rate composting/recycling services for businesses and residents.

6.4 Government Solid Waste Reduction Measures

Table (12): Proposed Government Solid Waste Reduction Measures

Reduce Landfilled Waste in half by 2020 over 2004 levels by:
Implementing a duplex copying/printing policy in municipal office buildings
Reducing Landscape Waste in City landscapes by implementing StopWaste.Org's *Bay-Friendly Landscaping* Program. Include practices such as: Increase on-site composting and mulching of municipal plant debris, using compost as a soil amendment, mulch for weed suppression, including the use of drip irrigation systems, a diverse plant pallet to resist pests, and reducing turf and sheared hedges.
Increasing recycling and composting in municipal facilities
Adopting policies that support reduced waste (and which support other environmental priorities) including the following: Environmental purchasing policy 75% Diversion Goal Construction &Demolition materials recycling ordinance Civic Bay-Friendly/Green Building Ordinance Residential green building resolution Consider mandatory residential & commercial recycling/composting ordinance
Revising franchise language as franchises are renegotiated to include language that maximizes diversion (see StopWaste.Org for best practices)