

# City of Anacortes



## Greenhouse Gas Inventory & Proposed Climate Action Plan *November, 2006*



*Serving Island, Skagit and Whatcom Counties*

Prepared by ICLEI – Local Governments for Sustainability for the  
Northwest Clean Air Agency and the City of Anacortes

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# Acknowledgements

In embarking on this project, Anacortes demonstrates its commitment to working to reduce energy consumption and associated greenhouse gas emissions. The creation of this document was supported by Mayor Maxwell and Russ Pittis, Facilities Manager, who served as the City Liaison for this project. Many thanks also go to the city employees, especially those in the Finance and Public Works Departments, for their willingness to answer countless questions. Their participation ensured the successful completion of this report.

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# **City of Anacortes Proposed Climate Action Plan**

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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 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 reductions in water supply, decreased agricultural output, increased catastrophic weather events such as forest fires, drought and floods, and coastal erosion due to sea-level changes. (Please see section I.A for more information about the science of climate change.)

**Anacortes must do its part.** Although the United States accounts for a mere 4% of the world's population, it produces 25% of the world's greenhouse gases. The Anacortes community released 172,536.7 tons of eCO<sub>2</sub> in 2000. It is projected to emit 66% more in 2020. Municipal emissions from the city government's operations totaled 12,291 tons of eCO<sub>2</sub> in 2000. It is projected that emissions in the municipal sector will increase 71% by 2020. However, in the spring of 2006, Anacortes signed a Memorandum of Understanding with ICLEI-Local Governments for Sustainability, pledging to take action against this destructive trend by completing Milestones One, Two, and Three of the Cities for Climate Protection<sup>®</sup> (CCP) Campaign. This program is composed of a Five Milestone Process to combat global warming:

- 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.

Based on the community and municipal inventories and forecasts, it is recommended that the community and municipality make a commitment to reduce emissions by 15% below 2000 levels by 2020. (In the case of Anacortes, Milestone 2 does not entail formally adopting this emissions reduction target for the city, but simply providing this suggested target, which is consistent with the data collected during the course of this project.)

### Anacortes' Climate Action Plan

This Climate Action Plan has been developed based on the results from the Anacortes baseline year (2000) and interim year (2005) inventories for the community and municipality. Using this emissions data, it was then possible to create a business-as-usual forecast and reduction target for 2020. Next, a list of existing energy efficiency measures was compiled and quantified. Finally, specific recommendations about emissions reductions were made for each sector of community and municipal operations. The success of this action plan relies on the implementation of these measures and the involvement of key government and community stakeholders.

### Next Steps

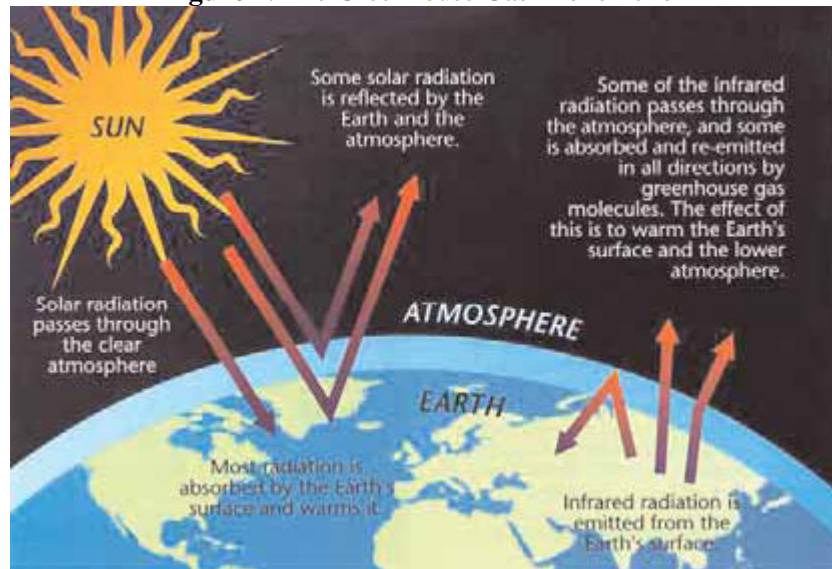
The Action Plan contains a number of recommendations regarding future city policy and efforts. One recommendation stands out above the others as the clear next step: *work with Puget Sound Energy to fund a resource conservation manager*. PSE has expressed interest in partnering with Anacortes in this effort, and is generally willing to provide a guarantee that the cost savings that such a position will create will more than pay for their salary. In addition they will pay 25% of the first year's salary. This hiring will have very little or no cost and provide a high likelihood of both identifying significant savings and paying dividends for the environment.

## I. Introduction

### A. 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 60°F. Carbon dioxide (CO<sub>2</sub>) is the most prolific of these gases. Other contributing gases include methane (CH<sub>4</sub>), nitrous oxide (NO<sub>2</sub>), ozone (O<sub>3</sub>) and halocarbons. Without the natural warming effect of these gases the Earth's surface temperature would be too cold to support life. (Figure 1)

**Figure 1: The Greenhouse Gas Phenomenon**



Source: US Environmental Protection Agency

However, recently elevated concentrations of these gases in the atmosphere have had a destabilizing 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. <sup>1</sup>According to NASA scientists, the 1990s were the warmest decade of the century, and the first decade of the 21<sup>st</sup> 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. <sup>2</sup>

#### Scientific Facts and Projections:

- The atmospheric concentration of carbon dioxide (CO<sub>2</sub>) during the last two decades has increased at the rate of 0.4% every year.
- Current CO<sub>2</sub> 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<sub>2</sub> emissions produced by human activity during the past 20 years are due to the burning of fossil fuels.

Source: The UN Intergovernmental Panel on Climate Change (IPCC) TAR: Summary for Policy Makers

<sup>1</sup> United Nations Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report. "Climate Change 2001: Synthesis Report. Summary for Policy Makers" <http://www.ipcc.ch/pub/un/syeng/spm.pdf>

<sup>2</sup> NASA Goddard Institute for Space Studies, [http://www.nasa.gov/vision/earth/environment/2005\\_warmest.html](http://www.nasa.gov/vision/earth/environment/2005_warmest.html)

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 that for each ton of carbon dioxide emitted from a power plant or a vehicle's tailpipe, the Earth will warm a certain amount. 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<sub>2</sub> 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<sub>2</sub>, scientists anticipate they will reach a saturation point, after which each ton of anthropogenic emissions of CO<sub>2</sub> will have a more substantial impact.<sup>3</sup> 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 will tend 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 race against global warming.

## *B. Effects & Impacts of Climate Change*

### **Global Impacts**

Changes in temperature and climate will have a dramatic impact on plants and animals that are adapted to conditions that will no longer prevail. Surface temperatures are on course to increase by between 2.5 and 10.5°F by the year 2100, with regions in the northern parts of North America and Asia heating by 40% above the mean increase.<sup>4</sup> In addition to causing average temperature increases, rising levels of greenhouse gases have a destabilizing effect on a number of different microclimates, conditions and systems.

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.

Globally, snow cover has decreased by 10% in the last forty years. Average sea level has risen between 1/3 and 2/3 of a foot over the course of the 20th century and is projected to rise by at least another 1/3 of a foot and up to almost 3 feet by the year 2100.<sup>5</sup> 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.

### **Local Impacts**

Climate change is a global problem influenced by an array of interrelated factors that have concrete consequences for the Pacific Northwest. A 2005 report by the University of Washington's Climate Impacts Group found that climate change will significantly challenge the region's natural and built systems.<sup>6</sup> (All subsequent mention of climate impacts in Northwest, aside from the studies directly cited, reference the Climate Impacts Group 2005 study.)

**Natural disasters:** The Climate Impacts Group has found that local climate trends will reflect continued increases in both average air and water temperatures. Additionally, sea level rise is likely to occur faster than global averages and earlier snowmelt may cause changes in river and

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<sup>3</sup> United Nations Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report. "Climate Change 2001: Synthesis Report. Summary for Policy Makers" <http://www.ipcc.ch/pub/un/syeng/spm.pdf>

<sup>4</sup> Ibid

<sup>5</sup> Ibid

<sup>6</sup> Casola, Kay, Snover et. al. "Climate Impacts on Washington's Hydropower, Water Supply, Forests, Fish, and Agriculture." 2005. Climate Impacts Group, University of Washington: <http://www.cses.washington.edu/db/pdf/kc05whitepaper459.pdf>

stream flows. Sea level rise and increased seasonal flooding could incur considerable costs as these phenomena pose risks to property, infrastructure and even human life.

**Impact on water:** Water quality and quantity are also at risk to be depleted 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 snow pack melts in the spring.

Not only does such snow melt increase the threat for spring flooding, but it will also decrease the storage of the natural water tower in the Cascades, meaning less water will be available for agricultural irrigation, hydro-electric generation and the general needs of a growing population. As we have seen in recent years, water resources for agricultural and residential use may become scarce, especially during the summer months.

**Impact on plants and animals:** The local native plants and animals are also at risk as temperatures rise. Scientists are reporting more species moving to higher elevations or more northerly latitudes. Increased temperatures also provide a foothold for invasive species of weeds, insects and other non-native threats.

Nearby shore habitat such as coastal wetlands and salt marshes are at risk of being inundated by rising sea levels. Increased flow and salinity of water resources would also seriously affect the food web and mating conditions for fish that are of both economic and recreational interest to residents. These trends compound the challenges already posed to dwindling populations of salmon, at all stages of their lifecycle.

Additionally, the natural cycle of flowering and pollination, as well as the temperature conditions necessary for a thriving locally adapted agriculture would be altered. Perennial crops in particular will be challenged.

**Public health impact:** Warming temperatures and increased precipitation can be encouraging to mosquito-breeding, thus engendering diseases for which mosquitoes are vectors, such as the West Nile virus, a disease of growing concern in our region.

Increased temperatures also pose a risk to human health because it increases ozone levels and air pollution toxicity, which are tied to increased rates of asthma and other pulmonary diseases. Furthermore, the anticipated increase in hotter days poses heat-stroke risks particular for the elderly, young, those already sick, and people who work outdoors.

**Regional Evidence:** The impacts of climate change are already here, and are expected to continue to escalate if the levels of heat trapping pollution continue to increase. Figure 2a shows precipitation trends; 2b shows trends in April 1 snow pack.

Figure 2a: Precipitation trends (1920-2000)

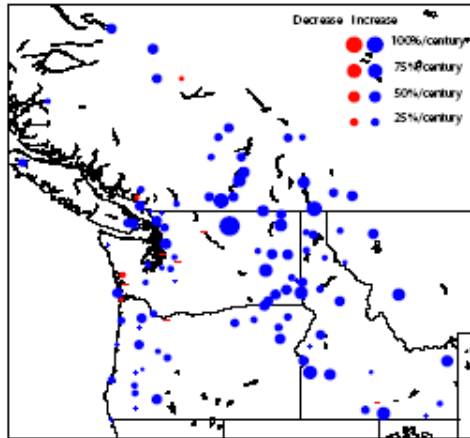
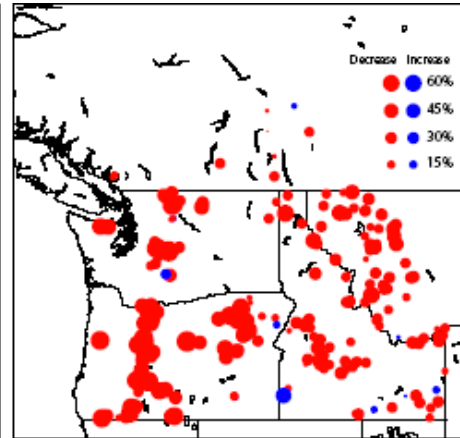


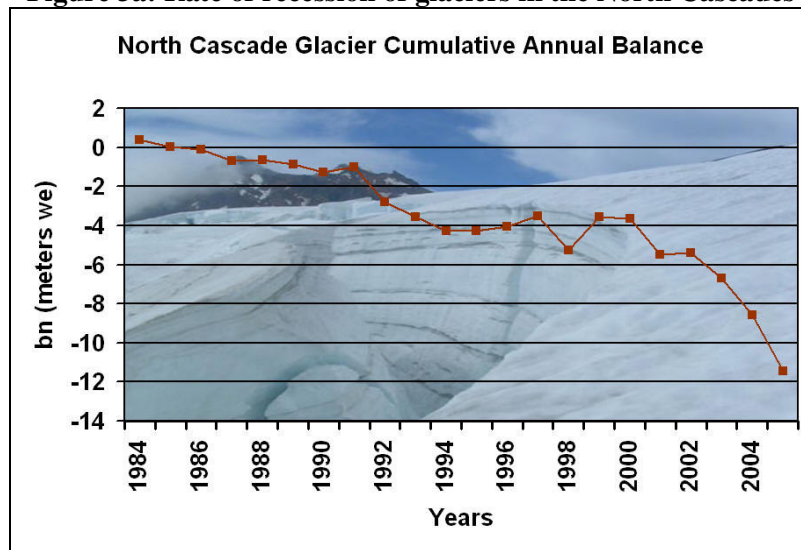
Figure 2b: Snow Apr 1 trend (1950-2000)



Source: Climate Impacts Group, University of Washington, 2006<sup>7</sup>

These figures above show widespread increases in average annual precipitation for the period 1920 to 2000 and decreases in April 1 snow water equivalent (an important indicator for forecasting summer water supplies) for the period 1950 to 2000. The size of the dot corresponds to the magnitude of the change. Figure 3a below indicates the rate that glaciers in the North Cascades are shrinking. The loss of glacier volume since 1984 represents 20 to 40 percent of entire glacier volume. Figure 3b on the next page illustrates how this change has been so dramatic and rapid it can be seen with the naked eye.

Figure 3a: Rate of recession of glaciers in the North Cascades



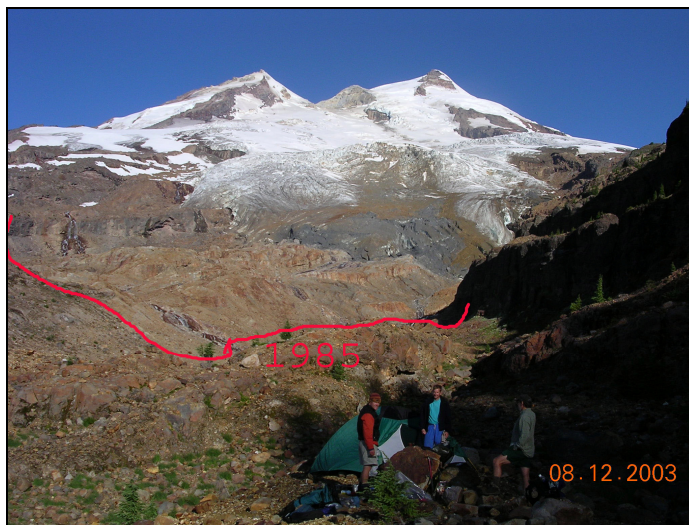
Source: North Cascades Glacier Climate Project<sup>8</sup>

Figure 3b: Eye-witness North Cascades Glacier Recession

<sup>7</sup> Climate Impacts Group. 2006. "Pacific Northwest 20th Century Climate Change." <http://www.cses.washington.edu/cig/pnwc/cc.shtml#figure1>

<sup>8</sup> North Cascades Glacier Climate Project. 2006. <http://www.nichols.edu/departments/Glacier/>



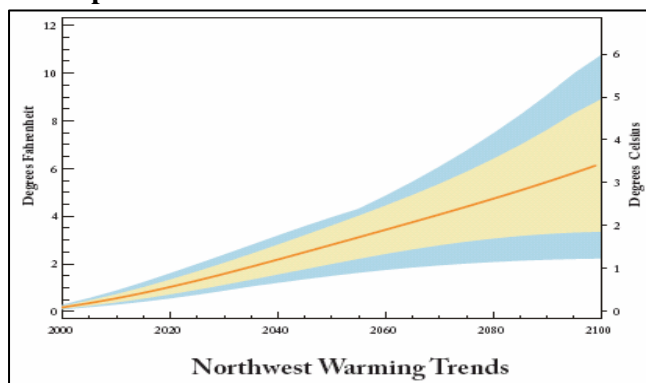


Source: North Cascades Glacier Climate Project<sup>9</sup>

Scientists have calculated a number of predicted increases in average temperature in the Northwest under ten different climate change study scenarios. Figure 4 below illustrates these predictions. Each scenario makes different assumptions about the levels of heat trapping pollution that humans will emit over the next one hundred years. The orange line indicates the average temperature from all of the scenarios. The yellow area indicates the temperature range that two-thirds of the scenarios fall within. The blue area indicates the full range of variability of all of the scenarios.

It is important to note that there is very little variability in short-term predictions of the average global temperature in the next twenty to thirty years. However, the long-term outcome will be governed by decisions made today. This phenomenon is due to the significant inertia in the climate system: the impact of gases already in the atmosphere will not become apparent until further into the future. Moreover, despite the proliferation of energy saving technologies, existing power plants and vehicles will continue to be used. The short and medium-term implications of climate change are unavoidable. But the long-term impacts that will be felt between 2040 and 2100 have a high range of variability.

**Figure 4: Temperature under increased emissions scenarios**



Source: University of Washington Climate Impacts Group. 2005. "Uncertain Future"

### *C. Action Being Taken on Climate Change*

<sup>9</sup> North Cascades Glacier Climate Project. <http://www.nichols.edu/departments/Glacier/>. 2006.

## National and State Action

Although significant action to prevent climate change has been lacking at the national level, there has been significant movement at the state and local levels.

**State Actions:** Many states have begun to consider the affects of climate disruption. A survey published in 2003 found that legislatures in 21 different states had passed legislation specifically directed at climate change.<sup>10</sup> The most common laws covered by the survey call for studies of the impacts of climate change, require inventories of the states' greenhouse gas emissions and creation of commissions to study the possible implications of greenhouse gas trading systems.

In addition to these individual state actions, there are two regional coalitions coordinating an interstate agreement to prevent climate change: the West Coast Governors' Global Warming Initiative and the Regional Greenhouse Gas Initiative (RGGI) of the Northeastern and Mid-Atlantic states.

The West Coast Governors' Global Warming Initiative was approved in 2004 by the Governors of California, Oregon and Washington. The Initiative attempts to synchronize a number of climate change measures each state was independently pursuing, including the bulk purchase of hybrid cars for state fleets and organizing the deployment of electrification technologies at truck stops throughout the I-5 corridor. The RGGI coalition has also set reduction targets for heat trapping pollution emitted from the generation of electricity and is trying to establish a market-based regional cap and trade emissions program they hope to put into effect by 2009.<sup>11</sup>

## Washington State

Over the past couple of years the Washington State Legislature has passed a number of bills that will have a significant impact on the reduction of greenhouse gas emissions.

**SHB 3141 (2004)** This bill initiates the process of regulating carbon emissions by requiring fossil fueled thermal power plants with a generating capacity of 25 MW or more to provide mitigation for 20 percent of the CO<sub>2</sub> emissions produced by that plant over a period of 30 years.<sup>12</sup>

**ESHB 1397 (2005)** Commonly called the "clean cars bill," this legislation adopts the California emissions standards for new cars, which are stricter than national standards. While the California standards, as they now stand, will have significant impact on the ambient air quality in our region, it will have only a minor impact on CO<sub>2</sub> emissions. Changes to the California standards, known as the "Pavley Amendment," are currently being reviewed by the California judiciary. If allowed, this rule would require significant improvements in average fuel efficiency and therefore would reduce CO<sub>2</sub> emissions significantly.

**SSB 6508 (2006)** This bill creates a renewable fuel standard requiring that biodiesel comprise a small percentage of all diesel sold in Washington and that all gasoline should be blended with a small percentage of ethanol. The percentage of the renewable fuels mandated for sale will be increased over time as the Department of Agriculture determines that the state's farmers have the capacity to meet the demand.

## 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 on both the international and local level for more than ten years, representing over 770 local governments around the world. ICLEI was

<sup>10</sup> U.S EPA. <http://yosemite.epa.gov/oar/globalwarming.nsf/content/ActionsStateLegislativeInitiatives.html>

<sup>11</sup> Regional Greenhouse Gas Inventory: <http://www.rggi.org/agreement.htm>

<sup>12</sup> House Bill Report: HB 3141, As Reported by House Committee On: Technology, Telecommunications & Energy. 2004. <http://www.leg.wa.gov/pub/billinfo/2003-04/Pdf/Bill%20Reports/House/3141.HBR.pdf>

launched in the United States in 1995 and has grown to over 200 cities and counties providing national leadership on climate protection and sustainable development. In June 2006, ICLEI and the Northwest Clean Air Agency partnered to launch the Northwest Climate Protection and Energy Conservation Project funding, among other things, this report.

Additionally, a national effort called the U.S. Mayors' Climate Protection Agreement (MCPA) was launched locally by Seattle Mayor Greg Nickels to promote climate protection and the goals of the Kyoto Protocol – an international agreement addressing global warming pollution and ratified by 164 countries. On February 16, 2005, Seattle Mayor Greg Nickels launched the MCPA. Today it includes over 300 signatures from mayors representing over 49 million Americans in 44 states and Washington, D.C... Signing the agreement makes a pledge that your city will reduce its greenhouse gas emissions by 7 percent below 1990 levels by the year 2012. For more information about the MCPA, visit: <http://www.seattle.gov/mayor/climate/>

#### *D. 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 International 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 Five 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

In the spring of 2006, Anacortes Mayor Dean Maxwell signed a Memorandum of Understanding with ICLEI, committing Anacortes to completing a greenhouse gas inventory and draft Climate Action Plan. As part of this process, an emissions reduction target was recommended along with a set of recommendations about how to achieve that target.

## **II. Emissions Inventory**

### *A. Reasoning, Methodology & Model*

ICLEI's Cities for Climate Protection 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 from 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.

#### *1. CACP 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 equivalent carbon dioxide units, or eCO<sub>2</sub>. Converting all emissions to equivalent carbon dioxide 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 eCO<sub>2</sub>.

The emissions coefficients and methodology employed by the software are consistent with national and international inventory standards established by the UN Intergovernmental Panel on Climate Change (1996 Revised IPCC Guidelines for the Preparation of National Inventories) and the U.S. Voluntary Greenhouse Gas Reporting Guidelines (EIA form 1605).

The CACP software has been and continues to be used by over 200 U.S. cities and counties to reduce their greenhouse gas emissions. However, it is worth noting that, although the software provides Anacortes 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. Inventory Sources and Creation Process*

The creation of an emissions inventory required the collection of information from a variety of sectors and sources. For the community, the main sources of data were Puget Sound Energy (electricity), Cascade Natural Gas (natural gas), the Engineering Department (total vehicle miles traveled), and the Solid Waste Division (waste). For the municipal inventory, the primary data sources were Puget Sound Energy (electricity), Cascade Natural Gas (natural gas), vehicle fuel records, and an employee survey. A variety of other sources were used to calculate waste and indicator inputs.

This data was entered into the software to create a community emissions inventory and a municipal emissions inventory. The community inventory represents all energy use within Anacortes, including residential, commercial and industrial sectors, and its contribution to greenhouse gas emissions. The municipal inventory is a subset of the community inventory, and includes energy use and emissions derived from internal government operations.

There are two main reasons for completing separate emissions inventories for community and municipal operations. First, once the government has committed to taking action on climate change, it 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 Anacortes government takes a visible leadership role in the effort to save energy, reduce operating costs and address climate change. This is important for inspiring local action in Anacortes, as well as for inspiring other nearby communities.

The community and municipal inventories are both based on the calendar year 2000. It was determined that an interim year inventory from 2005 would be useful for both the community and municipality for two reasons. First, an interim year inventory provides a more up-to-date report on emission levels and secondly, it provides an opportunity to gauge the impact of energy efficiency measures and programs put in place since the base year.

When calculating Anacortes' emissions inventory, all energy consumed within the city boundaries was included. This means that, even though the electricity used by Anacortes residents is produced elsewhere, this energy and emissions associated with it appears in Anacortes' 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.

It is important to note that the Shell Oil Refinery falls outside the city limits and was therefore excluded from the community inventory. The Port of Anacortes was also not included in the community inventory, as it is the jurisdiction of Skagit County; in the future, the Port could undertake its own emissions inventory with a particular eye to diesel emissions from boats.

In collecting this data, all reasonable attempts were made to include all sources of energy used. Cascade Natural Gas Corporation (CNGC) provided aggregate information regarding community-wide natural gas that delivered in each year. However, there may be some large natural gas customers that purchased their gas through a broker rather than directly from CNGC. Data regarding the existence or energy use of any such accounts was not available in time to be included in this analysis.

## *B. Inventory Results*

### Emissions Summary

**Table 1: Anacortes Emissions Summary – Year 2000**

	<b>Community Analysis</b>	<b>Municipal Operations Analysis</b>
Base Year: 2000		
eCO <sub>2</sub> Emissions (tons)	172,537	12,219

Source: CACP Model output

**Table 2: Anacortes Emissions Summary – Year 2005**

	<b>Community Analysis</b>	<b>Municipal Operations Analysis</b>
Interim Year: 2005		
eCO <sub>2</sub> Emissions (tons)	178,910	12,341

Source: CACP Model output

### 1. Community Emissions Inventory

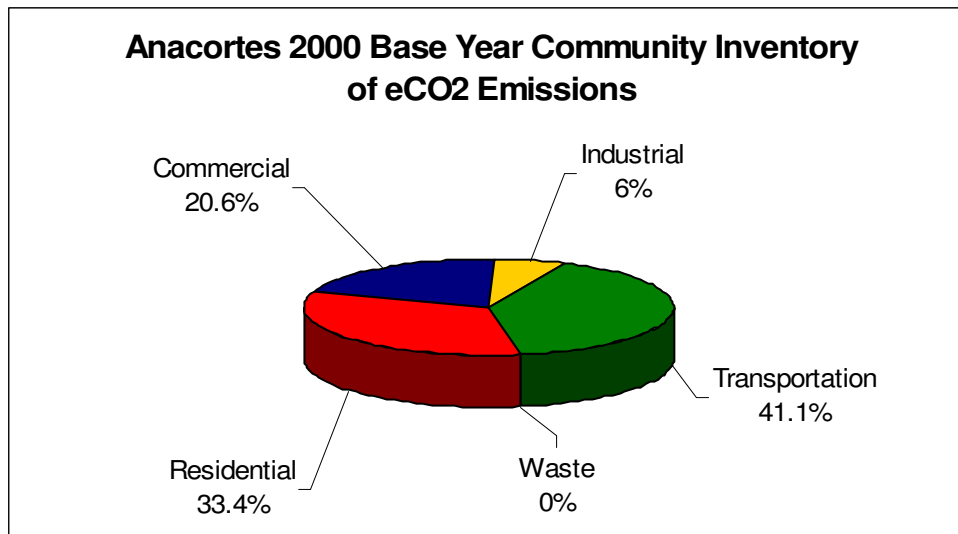
In the base year 2000, the community of Anacortes emitted approximately 172,537 tons of eCO<sub>2</sub>. In the interim year 2005, there was an overall growth in the tons of eCO<sub>2</sub> released to 178,910 tons. The two tables and figures below show the breakdown of community emissions by source type.

**Table 3: Anacortes Community Emissions Summary – Year 2000**

Potential Sources	Equiv CO <sub>2</sub> (tons)	Energy (million Btu)
Residential	57,612	647,522
Commercial	35,594	323,267
Industrial	10,370	82,947
Transportation	70,862	822,469
Waste	-1,901	--
<b>TOTAL</b>	<b>172,537</b>	<b>1,876,206</b>

Source: CACP Model output

**Figure 7: Anacortes Community Greenhouse Gas Emissions – Year 2000**



Source: CACP Model output

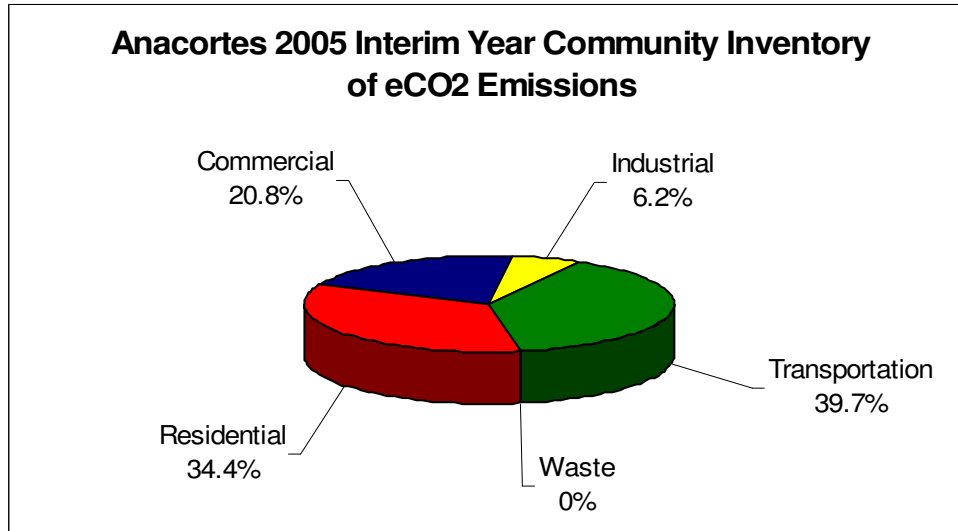
*Note: For the purposes of charting the community emissions, waste was entered as 0%. This explains why the percentage break-down in Figure 7 may not correspond exactly with the tonnage figure in Table 2.*

**Table 4: Anacortes Community Emissions Summary – Year 2005**

Potential Sources	Equiv CO <sub>2</sub> (tons)	Energy (million Btu)
Residential	61,622	688,421
Commercial	37,273	330,711
Industrial	11,042	88,515
Transportation	71,029	827,939
Waste	-2,055	--
<b>TOTAL</b>	<b>178,910</b>	<b>1,935,586</b>

Source: CACP Model output

**Figure 8: Anacortes Community Greenhouse Gas Emissions – Year 2005**



Source: CACP Model output

*Note: For the purposes of charting the community emissions, waste was entered as 0%. This explains why the percentage break-down in Figure 8 may not correspond exactly with the tonnage figure in Table 3.*

Energy/Stationary Source Emissions

Emissions from the residential, commercial, and industrial sectors in Anacortes are primarily composed of stationary sources. Stationary sources refer to emissions generated from fixed places or objects, such as buildings and homes, from which pollutants are released. The major source of emissions for all three sectors is electricity. Natural gas usage is the second largest. Energy use grew in the residential, commercial, and industrial sectors between 2000 and 2005. The largest growth occurred in the residential sector.

Note; Propane usage for the residential and commercial sectors in 2000 was calculated with data from the U.S. Office of Fiscal Management and the Energy Information Administration. These same figures were also used for 2005, assuming that no significant changes in propane usage had occurred. Industrial propane was not calculated, as it was assumed to be a relatively minor source of emissions in the community and data was not available.

### Transportation Emissions

Emissions from transportation were calculated based on estimates of vehicle miles traveled on different road types. This sector is responsible for the greatest proportion of emissions by one sector for the community analysis in both the base year and the interim year. Although the 2005 interim inventory shows that, as a percentage of total emissions, transportation emissions have dropped from 41.1% to 39.7%, the actual number of vehicle miles traveled has continued to increase.

### Solid Waste Emissions

For both 2000 and 2005, the solid waste sector produced negative emissions figures, meaning it actually served as an emissions *sink* and not an emissions *source*. The greenhouse gas emissions generated from waste are dependent on the type of waste being disposed of and the configuration of the landfill where waste is disposed. Two processes generally occur in a typical landfill. First, the waste does not completely decompose; causing some of the carbon that would have been released as CO<sub>2</sub> to actually be sequestered in the landfill. Second, because of the lack of oxygen in the landfill, the decomposing matter is released as methane, a greenhouse gas 21 times more potent than CO<sub>2</sub>. If methane is not captured or burned, landfills are net sources of greenhouse gas emissions. And in these cases, waste disposal can be a significant part of a community's climate pollution profile. However, the methane released can be captured to produce energy or it can be burned, which converts it back to the less potent CO<sub>2</sub>.

Anacortes' waste was sent to the Roosevelt Landfill, a sanitary landfill with a methane recovery factor of 80%. This means that what does decompose in the landfill is released as methane gas, 80% of which is captured (or "recovered") at the landfill. In Anacortes's case, the net result is that a little bit more carbon equivalent is buried and trapped in the landfill than is added to the atmosphere. This effect explains why eCO<sub>2</sub> emissions from our waste sector are reported as negative.

This does not mean that creating additional garbage is part of the solution, but that in Anacortes, waste reduction should not be a top priority for climate protection. It is also important to note that while waste reduction from recycling is not a priority for climate protection in this analysis, recycling saves a substantial amount of energy upstream by reducing the need for virgin inputs. While the benefits of recycling are not accounted for within the confines of this inventory, in the larger picture, it does have a net benefit for the climate.



## 2. Municipal Operations Emissions Inventory

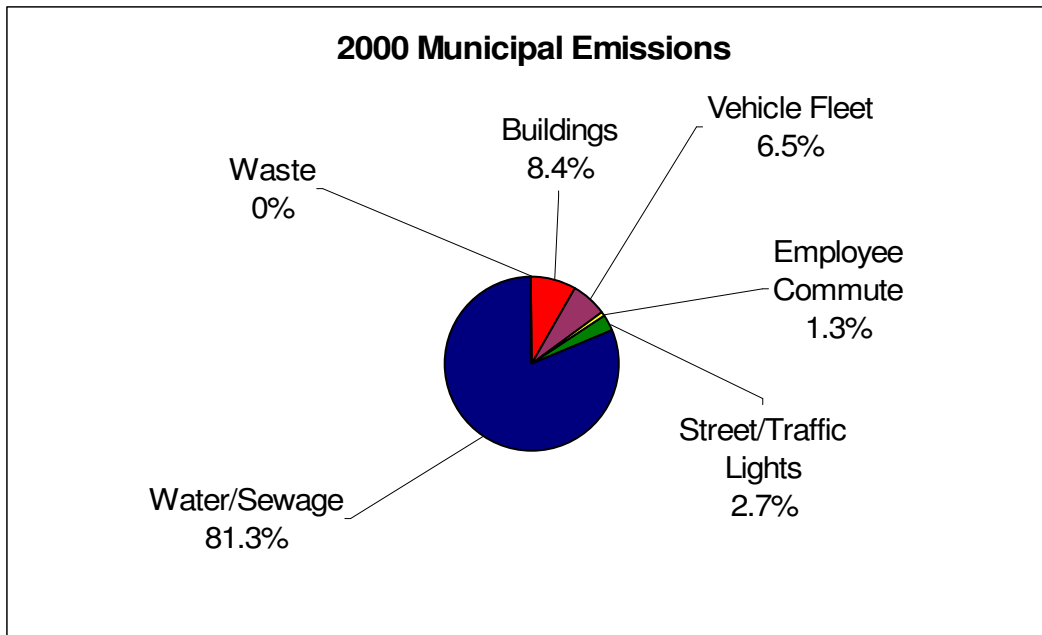
In the base year of 2000, Anacortes' municipal operations generated 12,219 tons of eCO<sub>2</sub>. This figure increased by approximately 1% to 12,341 tons of eCO<sub>2</sub> in 2005. In both 2000 and 2005, the largest source of eCO<sub>2</sub> emissions within municipal operations was the water/sewage sector. The Tables and Figures below show the breakdown of municipal operations emissions by source type.

**Table 5: Anacortes Municipal Emissions Summary – Year 2000**

Potential Sources	Equip CO <sub>2</sub> (tons)	Energy (million Btu)	Cost (\$)
Buildings	1,030	9,736	138,579
Vehicle Fleet	789	9,169	106,163
Employee Commute	165	1,913	No figures available
Streetlights	336	2,235	137,444
Water/Sewage	9,932	67,464	1,994,579
Waste	-32	--	34,656
<b>TOTAL</b>	<b>12,219</b>	<b>90,517</b>	<b>2,441,421</b>

Source: CACP Model output

**Figure 9: Anacortes Municipal Greenhouse Gas Emissions – Year 2000**



Source: CACP Model output

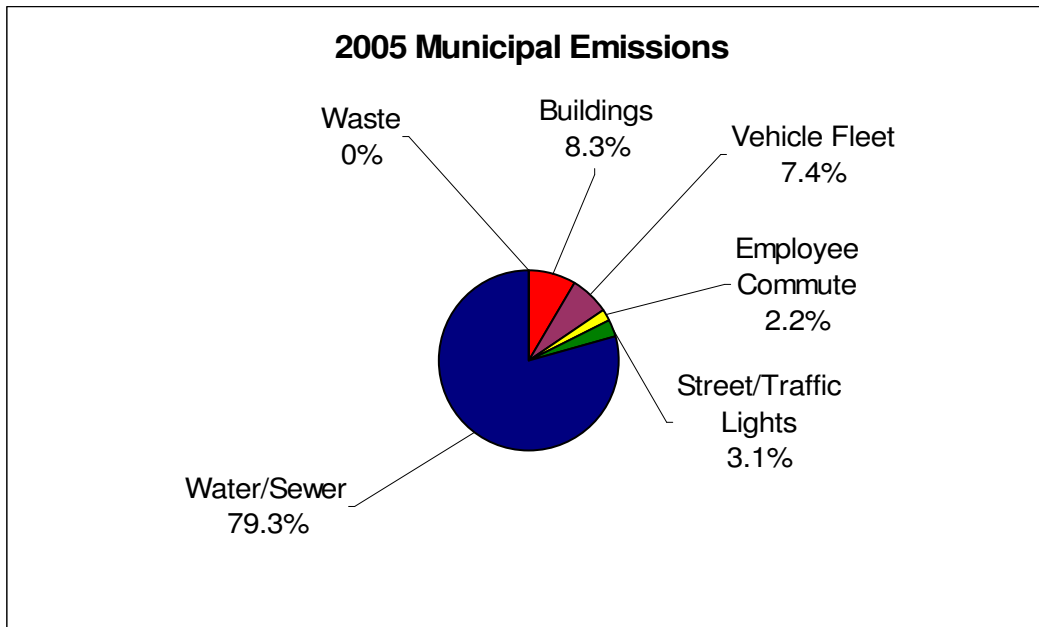
*Note: For the purposes of charting the municipal emissions, waste was entered as 0%. This explains why the percentage break-down in Figure 9 may not correspond exactly with the tonnage figure in Table 3.*

**Table 6: Anacortes Municipal Emissions Summary – Year 2005**

Potential Sources	Equiv CO <sub>2</sub> (tons)	Energy (million Btu)	Cost (\$)
Buildings	1,020	9,475	155,062
Vehicle Fleet	910	10,587	196,923
Employee Commute	271	3,177	No figures available
Streetlights	381	2,451	156,937
Water/Sewage	9,783	64,137	1,085,464
Waste	-24	--	35,416
<b>TOTAL</b>	<b>12,341</b>	<b>89,826</b>	<b>1,629,802</b>

Source: CACP Model output

**Figure 10: Anacortes Municipal Greenhouse Gas Emissions – Year 2005**



Source: CACP Model output

*Note: For the purposes of charting the municipal emissions, waste was entered as 0%. This explains why the percentage break-down in Figure 10 may not correspond exactly with the tonnage figure in Table 4.*

Local government emissions typically fall between 2 to 5 percent of overall community emissions. In 2000 and 2005, municipal emissions in Anacortes (as a percentage of the community’s total emissions) were a bit higher, at about 7 percent. (Anacortes owns and operates a large regional water treatment facility, most municipalities do not and this raises the municipal emissions level for Anacortes based on the additional electricity used at this facility.) In addition to contributing to achieving community wide emissions reduction goals, municipal action has symbolic value and demonstrates leadership that extends beyond the magnitude of emissions actually reduced. Additionally, the City of Anacortes has jurisdiction over decisions related to land use, service delivery, infrastructure investment, and building codes, and has substantial opportunity to engage in public education and outreach efforts. By harnessing this capacity, the city government can impact emissions reductions within the community.



### Energy/Stationary Source Emissions

Across sectors, stationary sources include “Buildings,” “Streetlights,” and “Water/Sewage.” The EPA considers stationary sources a place or object from which pollutants are released and that does not move around. Stationary sources can include power plants, gas stations, incinerators, or houses. Although natural gas and stationary diesel are used at some facilities, electricity usages at the above-mentioned facilities are responsible for more than 85% of emissions in both the base and interim years. In particular, the water/sewage sector is a major source of eCO<sub>2</sub> emissions. This includes both the Water Treatment Plant and the Waste Water Treatment Plant, and includes the building operations in addition to each facility’s pumps.

It is important to note, however, that while overall municipal emissions increased between 2000 and 2005, the building and water/sewage sectors decreased as a percentage of overall emissions. These reductions were accompanied by a significant cost difference between 2000 (\$2,411,421) and 2005 (\$1,629,802). It is assumed that the eCO<sub>2</sub> and cost differences are due to energy efficiency measures at these municipal facilities (see “Existing Municipal Measures”).

### Transportation Emissions

This category includes emissions from the vehicle fleet and employee commute sectors in city government operations. Emissions from both of these sectors increased between the base year and the interim year. Between 2000 and 2005, there was an overall trend in vehicle fleet management to retire compact and mid-size vehicles and increase the number of SUVs, pick-ups, and light trucks. This may have contributed to increased emissions.

### Solid Waste Emissions

Solid waste generated was estimated based on the number of FTE employees and national waste generation averages. In other communities where waste is either incinerated or disposed of in a landfill where methane is not captured, waste is often a significant contributor to greenhouse gas emissions. Because waste from Anacortes goes to Roosevelt Landfill, which recovers and flares the methane generated, sequestration is the dominant factor resulting in a net negative emission from waste.

### III. Forecast for Greenhouse Gas Emissions

Based on the community and municipal operations emissions inventories developed for Anacortes for the base year (2000), the next step was to forecast future emissions. The emissions forecast represents a business-as-usual prediction of how much greenhouse gas emissions are likely to grow and from which sectors this growth is likely to occur.

#### *Community*

The forecast year is based on ICLEI’s recommendation that forecasts are built 15-20 years out from the base year, which, in this case, was 2000. The emissions forecast for the community was based on two sources. The first was projected population growth for Anacortes. The Office of Fiscal Management’s projections for Skagit County and the 2000 U.S. Census Anacortes population data were used to determine the city’s average annual population growth between the years 2000 and 2020 (see “Forecasting Methodology” in Appendix). This was calculated to be 1.93%. Energy use trends by fuel type and sector were also included in the forecast model. These figures are from the US Energy Information Administration and address larger trends, such as bigger homes and more energy efficient vehicles. Together, these sources were used to construct the community forecast.

#### *Municipal*

The municipal forecast was created using the same forecast year as the community. While there are a variety of ways in which one could forecast municipal emissions, it was decided that population growth would be the best method. The reasoning is that as population grows so too does the demand for government services. In particular, the largest sources of municipal emissions, water and sewer operations, are tied to city population. Once again the Office of Fiscal Management’s projections for Skagit County and the 2000 U.S. Census’s Anacortes population data was used to calculate the total increase in population growth between the base year (2000) and the forecast year (2020). All reports in the CACP software were multiplied by this figure (1.45) to project emissions in 2020.

**Table 7: Anacortes Emissions Summary – Baseline and Target Year**

	<b>Community Analysis</b>	<b>Municipal Operations Analysis</b>
<b>Base Year</b>	<b>2000</b>	<b>2000</b>
eCO <sub>2</sub> Emissions (tons)	172,537	12,219
<b>Target Year</b>	<b>2020</b>	<b>2020</b>
Business-as-usual projection of eCO <sub>2</sub> emissions (tons)	259,534	17,158

Source: CACP Model output

Conducting an emissions forecast is also essential for setting the reduction target, since the recommended amount of greenhouse gas emissions Anacortes should pledges to reduce should take into account projected emissions and known trends.

## IV. Greenhouse Gas Emissions Reduction Target

A reduction target provides a tangible goal for Anacortes' emissions reduction efforts. Our emissions reduction target represents a percentage by which the community aims to decrease emissions, below the recommended 2000 baseline, by a target year.

Many factors were considered when selecting a suggested reduction target for Anacortes that is both aggressive and achievable given local circumstances.

The Kyoto Protocol target of 7% below 1990 levels was the target the United States agreed to in principal at the 1997 United Nations Council of Parties meeting, but has yet to ratify in Congress. Several European nations set similar goals and have begun action towards meeting them. The United Nations' Intergovernmental Panel on Climate Change, the world's premier scientific body examining the issue, suggests that we would need to achieve as much as a 60-80% reduction below 1990 levels in order to reverse global warming and stabilize the climate.

Local factors considered in selecting the percentage of target reduction included estimation of the effects of implemented and planned programs and policies, an approximate assessment of future opportunities to reduce emissions, and, in particular, targets adopted by peer communities. A review of current CCP participants' reduction targets reveals a broad range with the average being between 10-20%. Considering the range of available measures in Anacortes, the relatively small size of the community, and commitments of other communities in the area, fifteen percent was selected as the target. If reductions are higher than expected, a new target of 20% will be adopted.

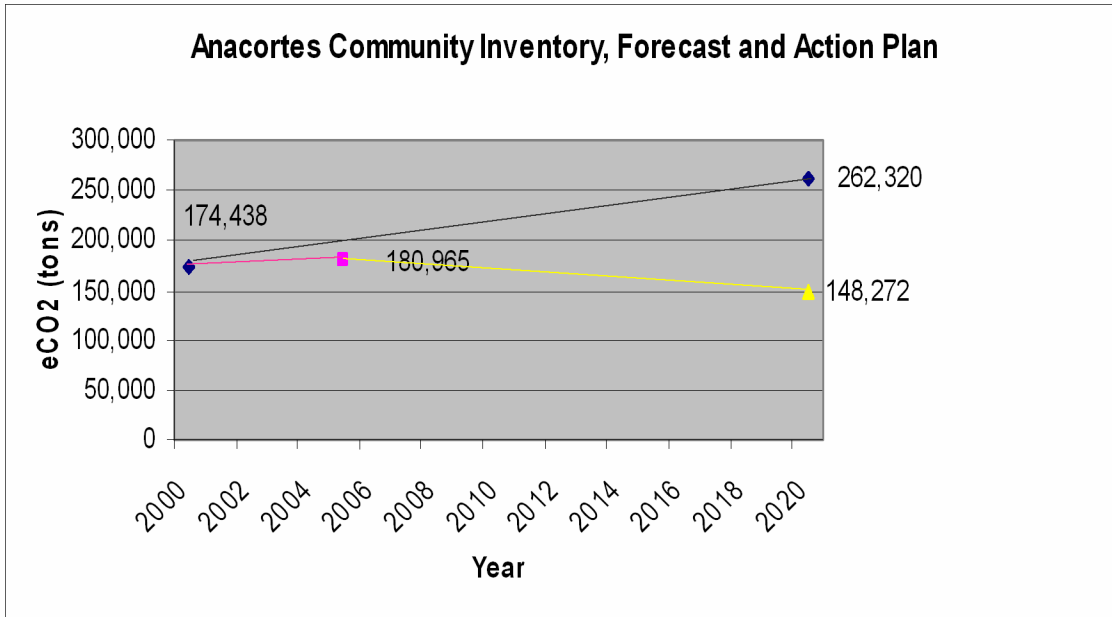
**It is recommended that Anacortes City Council adopt a reduction target of 15% by the year 2020 for both the community and municipal operations.**

**Table 8: Anacortes Emissions Summary – Baseline, Target Year and Reduction Target**

	<b>Community Analysis</b>	<b>Municipal Operations Analysis</b>
<b>Base Year</b>	<b>2000</b>	<b>2000</b>
eCO <sub>2</sub> Emissions (tons)	172,536	12,219
<b>Target Year</b>	<b>2020</b>	<b>2020</b>
Business-as-usual projection of eCO <sub>2</sub> emissions (tons)	259,534	17,158
<b>Reduction Target below 2000 levels</b>		
Percent eCO <sub>2</sub> reduction	15%	15%
eCO <sub>2</sub> Emissions (tons)	112,801	6,771

Source: CACP Model output

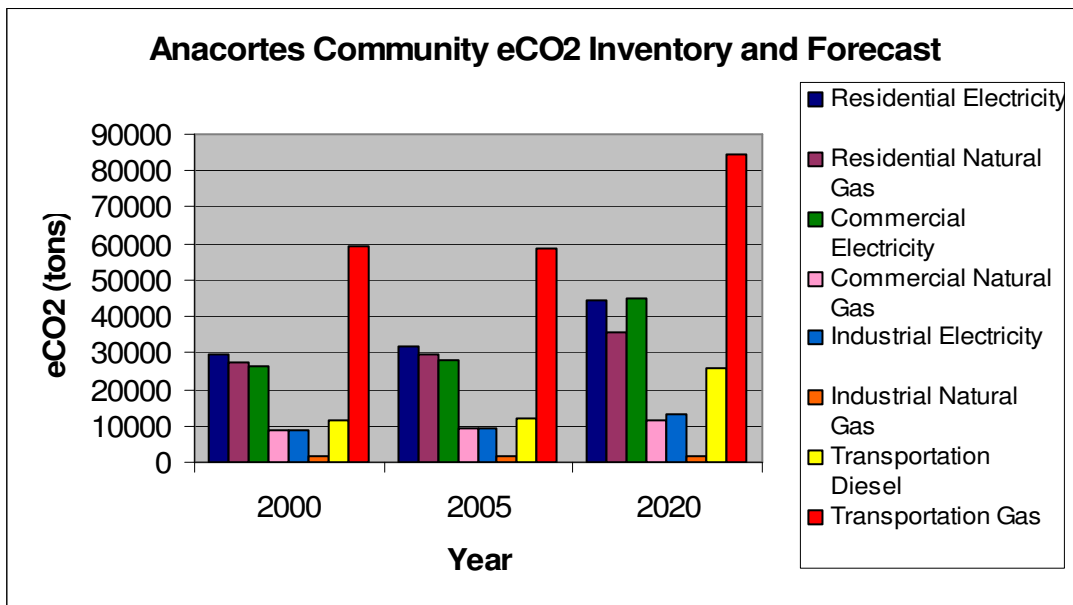
**Figure 11: Overall Community Emissions Trends**



Source: CACP Model output

This graph shows the 2000 base year inventory results (first blue diamond) and the 2020 forecast model (blue line). The pink line indicates the results of the 2005 interim year inventory, which falls below the business-as-usual trend line. While emissions levels in 2005 have grown since 2000, they have not grown as rapidly as expected based on the forecast model. This is believed to be a result of two main factors: the efforts made by both the government and the private sector to reduce emissions and the fact that 2005 was a warmer than typical winter in the region, requiring less heating. The yellow line represents the reduction target goal of 15% below 2000 levels by 2020.

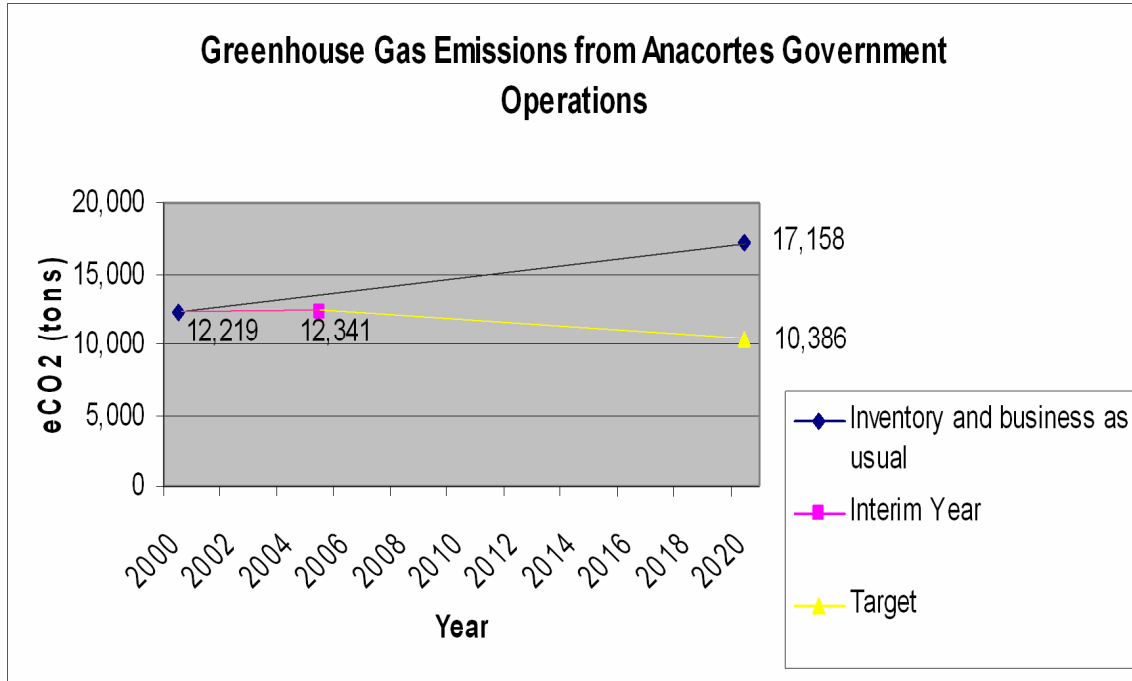
**Figure 12: Community Emissions Trends by Sector**



Source: CACP Model output

Using the base year, interim year, and forecast year inventories, the above chart illustrates growth trends in the various community sectors.

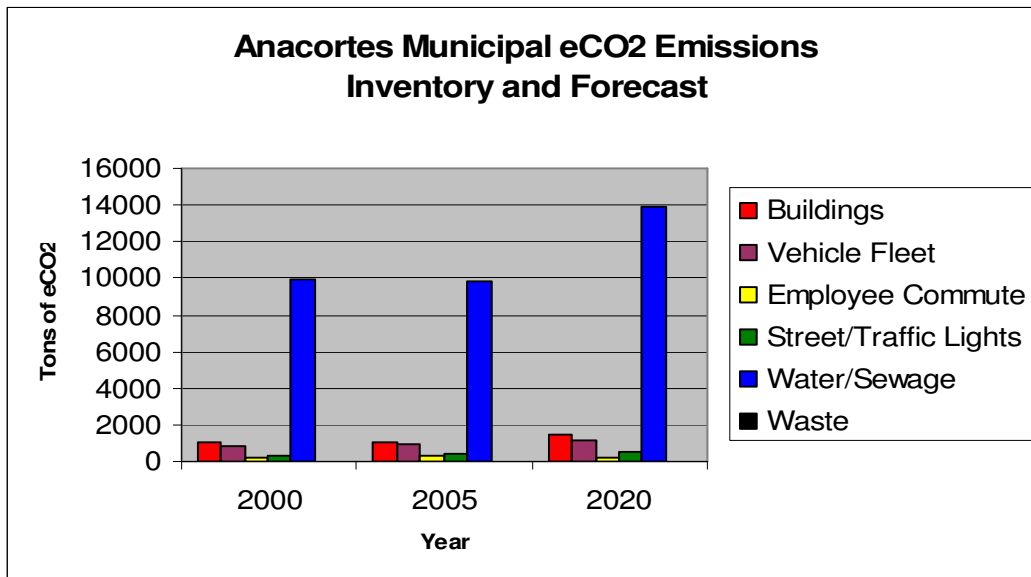
**Figure 13: Overall Government Emissions Trends**



Source: CACP Model output

The same analysis was used for the municipal forecast and target. In this case there was also growth in emissions between 2000 and 2005, but not at the rate expected in the forecast. In addition to a warm winter and existing measures, several municipal buildings were replaced or substantially remodeled during this time period, which may account for much of this difference between expectations and outcome. Figure 14 below illustrates growth in the various municipal sectors, based on the base year, interim year, and forecast year inventories.

**Figure 14: Government Emissions Trends by Sector**



Source: CACP Model output



## V. Existing Measures

At both the community-scale and within municipal operations, Anacortes has already undertaken a number of programs, policies and projects that help to reduce the greenhouse gas emissions that cause global warming.

### A. Existing Community-Scale Measures

Anacortes has already undertaken a number of community-scale measures that have resulted in reduced greenhouse gas emissions relative to the base year of 2000. These measures are an excellent first step towards significant reductions of greenhouse gas emissions in the community. According to estimates produced using the CACP software, these measures already account for 2,276 tons eCO<sub>2</sub> reduction, or about 2% percent towards Anacortes' ultimate reduction goal of 112,801 tons by 2020. The measures have been broken down by sector and are outlined below.

**Table 9: Existing Community Greenhouse Gas Emissions Reduction Measures**

<b>Policy</b>	<b>Year Implemented</b>	<b>Annual Tons of eCO<sub>2</sub> Reduction</b>	<b>Project Lead/Contact and Department</b>
<i>Residential</i>			
<i>Green Power Purchase</i>	2005	331	Heather Mulligan, PSE
<i>Waste</i>			
<i>Residential Recycling<sup>13</sup></i>	2003	1,945	City of Anacortes
<b>Total reduction</b>		<b>2,276</b>	

Source: CACP Model output

### B. Existing Municipal Operations Measures

Anacortes has also already undertaken a number of municipal operations measures resulting in reduced greenhouse gas emissions relative to the base year of 2000. These measures are an excellent first step towards significant reductions of greenhouse gas emissions from municipal operations. According to estimates produced using the CACP software, these measures already account for 162 tons eCO<sub>2</sub> reduction, or about 2% percent towards Anacortes' ultimate municipal operations reduction goal of 6,771 tons by 2020. They have been broken down by sector and are outlined below.

<sup>13</sup> Under EPA guidelines, recycling is considered to reduce emissions from upstream energy use and forest sequestration. Recycling materials is assumed to eliminate the need to use a comparable amount of virgin materials and therefore to eliminate the climate change consequences of the use of those virgin materials. This explains how recycling can further reduce emissions from a waste sector which already has emissions that are less than zero.

**Table 10: Existing Municipal Greenhouse Gas Emissions Reduction Measures**

<b>Policy</b>	<b>Year Initiated</b>	<b>Annual Tons eCO<sub>2</sub> Reduction</b>	<b>Annual Cost Savings</b>	<b>Project Lead/Contact and Department</b>
<b><i>Buildings</i></b>				
<i>City Hall Boiler</i>	2003	19	\$3,133	Russ Pittis, Facilities Manager
<i>City Hall Lighting Retrofit</i>	2000-2005	1	\$105	Russ Pittis, Facilities Manager
<b><i>Vehicle Fleet</i></b>				
<i>Toyota Prius Hybrid</i>	2003	2	\$540	Larry LaRue, Vehicle Fleet Supervisor
<b><i>Water/Sewage</i></b>				
<i>Water Treatment Plant Lighting Retrofit</i>	2002	24	\$2,526	Willy LaRue, Plant Manager
<i>Waste Water Air Compressor</i>	2004	27	\$3,802	Bob Hendrix, Plant Manager
<b><i>Waste</i></b>				
<i>Government Recycling</i>	2001	89	--	Russ Pittis, Facilities Manager
<b><i>Total reduction</i></b>		<b>162</b>	<b>\$10,106</b>	

Source: CACP Model output

Quantifying the emissions reductions achieved from existing measures already in place in Anacortes provides a sense of how much the city has already achieved in terms of approaching the recommended target and how much further measures must go to reach that target. In order for Anacortes to achieve its reduction target of 15%, the community will have to reduce an additional 117,134 tons of eCO<sub>2</sub> emissions.

**Table 11: Anacortes Emissions Summary – Reduction Achieved and Necessary**

	<b>Community Analysis</b>	<b>Municipal Operations Analysis</b>
<b>Base Year</b>	<b>2000</b>	<b>2000</b>
eCO <sub>2</sub> Emissions (tons)	172,537	12,219
<b>Target Year</b>	<b>2020</b>	<b>2020</b>
eCO <sub>2</sub> Emissions (tons)	259,534	17,158
<b>Reduction Target</b>		
Percent eCO <sub>2</sub> reduction	15%	15%
eCO <sub>2</sub> Emissions (tons)	112,801	6,771
<b>Existing Reductions to Date</b>		
eCO <sub>2</sub> Emissions (tons)	2,276	162
<b>Reductions Necessary to</b>		

<b>Reach Target</b>	
<b>eCO<sub>2</sub> Emissions (tons)</b>	<b>110,525</b> <b>6,609</b>

Source: CACP Model output

## **VI. Proposed Emissions Reduction Measures**

The following eCO<sub>2</sub> reduction measures are based on careful consideration of the distribution of emissions produced across various sectors, resources available and potential costs and co-benefits of each measure. Where possible, CACP Software was used to estimate the greenhouse gas reductions in tons and in cost savings. These measures will not only result in reduced greenhouse gas emissions; they will also improve the air quality, health, and livability of the community and will contribute to the realization of a number of community values and goals. The measures have been broken down by sector and are described below.

*Note: The eCO<sub>2</sub> reductions and savings explained below as Community and Municipal Measures are based on estimates using 2005 numbers and their effects could likely continue to grow over time. All eCO<sub>2</sub> reductions and savings are annual.*

### *A. Community Measures*

#### ***Residential***

1. *Community Green Power Challenge:* Puget Sound Energy (PSE), which serves the community's electricity needs, offers a Green Power Program. This program allows customers to express a preference for electricity generated from renewable energy sources. PSE currently offers renewable energy from wind, solar, and biomass projects in the Pacific Northwest. Currently, green energy costs \$0.02/Kwh more than regular electricity. The extra money that customers pay each month provides capital for developing and maintaining these energy sources. If purchasing green energy through PSE is done in conjunction with energy conservation efforts, then the costs associated with purchasing green electricity could be minimal or non-existent. More information on PSE's Green Power Program is available at [www.pse.com](http://www.pse.com)

The Community Green Power Challenge encourages individuals to sign up for PSE's Green Power Program. Already, a number of customers are purchasing green electricity (see "Existing Community Measures"). By providing additional incentives for participants, such as discounts at local businesses and a sense of shared community pride, the City of Anacortes can encourage residents to make this purchase. The City of Bellingham is currently implementing such a challenge and would serve as an excellent regional example of how a Community Green Power Challenge works.

If a minimum goal of 10% of residential power coming from renewable energy sources is achieved, then using 2005 kwh use figures, this would mean that 5,964,291.1 kwh should be purchased through PSE's Green Power Program. Collectively, this purchase would prevent 2,946 tons of eCO<sub>2</sub> from being released,

The cost for residents is not much more expensive, and the more people who buy, the lower the cost will become. According to Puget Sound Energy, the local electricity provider, if the average residence purchases green power for the equivalent of 30% of their electric bill, they would only spend \$6 on green power per month. If 15% of commercial and residential establishments need to purchase 100% green power, or 100% of commercial and residential establishments buy just 15% of their electricity from green power, we can achieve our goal. Through a combination of enthusiastic supporters buying 100% and most residents and businesses making a small adjustment to their energy bill, the 15% green power goal is well within our reach.

**Recommendation:** Participate in PSE’s Community Green Power Challenge. Establish a goal to obtain 10% of residential electricity from renewable energy sources. Total eCO<sub>2</sub> reduction is 2,946 tons at an average additional cost of \$72/per year above the normal electricity bill.

2. *ENERGY STAR Buildings and Appliances:* The ENERGY STAR program evaluates products and buildings for energy efficiency. It is a nationally recognized program, jointly administered by the Environmental Protection Agency and the US Department of Energy. It is recommended that an education outreach program be developed in Anacortes to encourage residents and businesses to install ENERGY STAR appliances and equipment. Energy Star has many “open source” templates for education campaigns, as well as materials for distribution, available at their web site [www.energystar.gov](http://www.energystar.gov). A full listing of ENERGY STAR products is available at [http://www.energystar.gov/index.cfm?fuseaction=find\\_a\\_product](http://www.energystar.gov/index.cfm?fuseaction=find_a_product).

New buildings that meet ENERGY STAR approval are expected to reduce energy consumption by 15% above the energy code requirements, which also translates into cost savings. These buildings include features such as effective insulation, high performance windows, tight construction and ducts, efficient heating and cooling equipment and ENERGY STAR qualified lighting and appliances.

Anacortes can also provide education and incentives to builders who achieve the Energy Star standard. A range of incentives have been explored in other jurisdictions, from educational pamphlets to reduced permit fees. One possible approach would be for the city to provide expedited permit review for projects that commit to meeting this standard. This would have minimal cost to the City, but would provide a meaningful reward to builders.

**Recommendation:** Educate and encourage residents and businesses to install ENERGY STAR equipment. Incentives should be provided to encourage new buildings to meet the ENERGY STAR home envelope requirements. Energy savings will depend on the type and scale of construction projects.

### *Commercial & Industrial*

1. *Community Green Power Challenge:* It is recommended that the commercial and industrial sectors also be encouraged to participate in this PSE program (see description under the “Residential” sector). In adopting a 10% target for renewable electricity purchase, it is estimated that local businesses and industries will achieve a reduction of 2,605 tons of eCO<sub>2</sub> and 863 tons of eCO<sub>2</sub>, respectively. By participating in this program, businesses stand to benefit from improved status in the community, as well as advertising opportunities about their green power purchase.

**Recommendation:** Create a Community Green Power Challenge. Establish a goal to obtain 10% of commercial and industrial electricity from renewable energy sources. Total eCO<sub>2</sub> reduction in the commercial sector is 2,605 tons and 863 tons in the industrial sector.

### *Transportation*

1. *Develop a Community Trip Reduction Program and Implement Smart Growth Policies:* The transportation sector is responsible for the majority of eCO<sub>2</sub> emissions in the Anacortes community. Therefore, it is recommended that a community trip reduction program be developed to reduce the number of annual vehicle miles traveled by at least 5%. Such a reduction would

result in an eCO<sub>2</sub> reduction of 3,149 tons. By encouraging alternative forms of transportation, including carpooling, biking, walking, and using public transport, the community stands to reduce its transportation emissions, improve air quality and community health, save gas money, and create a more livable community.

The Resource Conservation Manager could work to develop a community trip reduction program, modeled on similar programs that exist in other communities around Washington State. For example, a community-wide trip reduction competition could be based on Washington State Department of Transportation's existing programs and promoted using existing networks of community groups, such as the Rotary Club. There could be incentives for these community groups to encourage their members to participate.

Smart growth policies, many of which the City is already pursuing, is another way the city government, and specifically the Planning Department, can reduce transportation emissions in the Anacortes community. Smart growth reduces on the need for automobiles by using transportation and land use policies to create more compact, mix-use communities that are accessible by foot, bike, and public transport. Additional benefits of smart growth include:

- a. Compact, accessible downtowns foster a sense of community
- b. Compact growth is more cost effective for local governments to provide services
- c. Property values increase in neighborhoods that are walkable and accessible to amenities and transit
- d. Public health can be improved through encouraging more active lifestyles
- e. The preservation of urban parks and green spaces<sup>14</sup>

**Recommendation:** Implement a community trip reduction program and smart growth policies to reduce eCO<sub>2</sub> emissions from transportation. Reduce the number of vehicle miles by at least 5%. Total reduction of eCO<sub>2</sub> is 3,149 tons.

### *Waste*

1. *Expand Recycling Program to Commercial Sector:* The residential recycling program has resulted in one of the highest recycling rates in this region (42% in 2005). There are several features that have added to this program's success. First, residential recycling is a required part of curbside garbage service. Second, residents are charged a flat rate. Third, the system was switched from a separate bin system to a commingled system in 2003. This change increased recycling tonnages substantially (see "Existing Community Measures") because it became easier to participate. Today, Anacortes non-profits can apply to participate in the residential recycling program, but there is no coordinated recycling program in the commercial sector. It is recommended that a commercial recycling program be developed and implemented, which would be specifically tailored to the needs of local businesses. It is expected that there will be significant eCO<sub>2</sub> reductions as a result of this new program.

**Recommendation:** Develop a city-wide commercial recycling program.

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<sup>14</sup> ICLEI Smart Growth Factsheet, 2006.

**Table 12: Proposed Community Greenhouse Gas Emissions Reduction Measures**

<b>Policy</b>	<b>Estimated Annual Tons eCO<sub>2</sub> Reduction</b>	<b>Recommended Time Frame</b>	<b>Possible Lead/Point Person for Project</b>
<b><i>Residential</i></b>			
<i>Community Green Power Challenge</i>	2,946	2-5 years	Resource Conservation Manager (RCM) <sup>15</sup> - <i>position to be created in conjunction with NWCAA &amp; Puget Sound Energy or Community Group</i>
<i>Energy Star Buildings and Products</i>		2-5 years	Same as above
<b><i>Commercial</i></b>			
<i>Community Green Power Challenge</i>	2,605	2-5 years	Same as above
<b><i>Industrial</i></b>			
<i>Community Green Power Challenge</i>	863	2-5 years	Same as above
<b><i>Transportation</i></b>			
<i>Community Trip Reduction Program</i>	3,149	2-5 years	Same as above
<b><i>Waste</i></b>			
<i>Commercial Recycling Program</i>		1-2 years	Operations/Accounts Payable

Source: CACP Model output

## ***B. Municipal Measures***

### ***Buildings***

1. *Green Power Purchase:* Puget Sound Energy, the municipality’s utility company, offers a Green Power Program. This program allows customers to express a preference for electricity generated from renewable energy sources. PSE currently offers renewable energy from wind, solar, and biomass projects in the Pacific Northwest. Currently, green energy costs \$0.02/Kwh more than regular electricity. If, however, the Anacortes government purchases more than 1 million kwh/year, the price of purchasing green power is only \$.01/kwh. The extra money that Anacortes would pay would provide capital for developing and maintaining these energy sources. If purchasing green energy through PSE is done in conjunction with energy conservation efforts at city facilities, then the costs associated with purchasing green electricity would be minimal or non-existent. More information on PSE’s Green Power Program is available at [www.pse.com/solutions/businessGreenPower.aspx](http://www.pse.com/solutions/businessGreenPower.aspx).

<sup>15</sup> Refer to pp. 31 for an in depth discussion about the Resource Conservation Manager position.

Such a purchase would be an excellent way to emphasize and draw attention to a community wide green power challenge (see Community Measures section).

The initial recommendation is that the City of Anacortes purchase one-fourth of its energy consumption in the “Buildings” sector through PSE’s Green Power Program. Using the 2005 figures for total kilowatt hours (1,358,387 kwh), this would amount to 339,596.75 kwh of renewable electricity being purchased annually for this sector. Total eCO<sub>2</sub> reduction is 168 tons.

**Recommendation:** Purchase one-fourth of the electricity use in this sector through PSE’s Green Power Program. Total eCO<sub>2</sub> reduction is 168 tons at a cost of \$6791 (at \$.02/kWh).

*2. Resource Conservation Manager Position (RCM): Trying to establish this position with the city is the highest priority recommendation contained in this report.* This program is offered by Puget Sound Electricity (PSE). The utility company will work with the municipal government (or consortium of local governments) to either hire a RCM or train a current employee to work part-time or full-time for this position. Based on Anacortes current energy use PSE would sponsor a half time RCM. This position could be shared with another jurisdiction (school district, other cities, etc) or the RCM role could comprise half of the duties of one regular employee. PSE has expressed an interest in tailoring this project to Anacortes’ needs.

The RCM’s job is to recommend and implement energy efficiency measures in government facilities and operations. PSE guarantees that the energy savings in each of the first three years of the program are substantial enough to pay for the RCM’s salary. Based on the assumption that this salary is \$50,000 and the cost of electricity is \$0.07/kwh, it was calculated that RCM manager will realize energy reductions of 357,143 kwh. The impact of these energy conservation measures is to prevent 176 tons of eCO<sub>2</sub> from being released into the atmosphere.

**Recommendation:** Create a Resource Manager Position and use energy savings to pay his/her salary. Total eCO<sub>2</sub> reduction is 176 tons.

*3. Computer Monitor Upgrades:* These upgrades are expected to take place in the next two to three years. Bill Chambers, IT Specialist, will be in charge of this project. He will be replacing 185 CTR monitors with LCD monitors, which are expected to use one-third of the energy that a CTR monitor requires. The annual kwh reduction as a result of these upgrades is expected to minimize eCO<sub>2</sub> emissions by 11 tons and realize savings of \$1,732.

**Recommendation:** Replace CTR computer monitors with energy efficient LCD monitors. Total eCO<sub>2</sub> reduction is 11 tons with \$1,732 in savings.

*4. LED Exit Signs:* It is estimated that there are 33 incandescent and fluorescent exit signs in city buildings. Assuming that these exit signs are replaced by Energy Star-rated LED exit lights, the City of Anacortes can expect to see a reduction of 36 tons of eCO<sub>2</sub> each year, in addition to \$5,491 saved in energy bills. With these kinds of savings, the payback period is very short.

*Note: In the summer of 2006, 27 LED exit lights were installed at City Hall, Fidalgo Center, and at Fire Station I. This leaves 6 more lights to be replaced in Fire Stations I and II.*

**Recommendation:** Install LED exit lights in city facilities. Total eCO<sub>2</sub> reduction is 36 tons with \$5,491 in savings.



5. *Vending Machine Controllers*: Puget Sound Energy is currently installing vending machine controllers for free. These devices incorporate sensors to monitor occupancy, temperature, and electric current and are easy to install. There are vending machines in City Hall, the Maintenance Shop, and the Public Safety Building and it is recommended that controllers are installed in all three machines. This is expected to reduce eCO<sub>2</sub> emissions by 2 tons and save \$349.

**Recommendation:** Install vending machine controllers for free from PSE. Total eCO<sub>2</sub> reduction is 2 tons with savings of \$349.

### ***Vehicle Fleet***

1. *Increase Number of Hybrids in Fleet*: Based on eCO<sub>2</sub> reduction and cost savings calculations for the government's 2004 Toyota Prius hybrid, it is recommended that the City replace the other mid-size car in its fleet, a Ford Taurus Sedan, with a hybrid vehicle. This would reduce municipal emissions by another 2 tons of eCO<sub>2</sub>. Based on current upward trends in gas prices, it is expected that there will be significant fuel cost savings as a result of this purchase. A conservative estimate indicates that the city could save \$550-600 annually.

In addition to replacing the Ford Taurus with a hybrid, it is recommended that the government, in consultation with the Vehicle Fleet Supervisor, retire old, inefficient vehicles and begin to replace these vehicles with more fuel efficient models. If possible, additional hybrids should be purchased at this time.

**Recommendation:** Replace other mid-size car in vehicle fleet with a hybrid. Total eCO<sub>2</sub> reduction is 2 tons with savings of \$550-600. In general, phase-out old fuel inefficient vehicles and replace with hybrids whenever possible.

2. *Use Biodiesel (B20) in the Garbage Trucks*: The government's garbage truck fleet is composed of 6 heavy diesel trucks and administered by the Sanitation Department. These trucks consume more diesel than any other department fleet. Thus, it is logical to recommend the use of biodiesel in these vehicles. The B20 blend is 20 percent by volume biodiesel and 80 percent by volume petrodiesel. Such a change would result in a reduction of 39 tons of eCO<sub>2</sub>. Biodiesel burns cleaner and therefore contributes less to local air pollution than petrodiesel.

Biodiesel is available regionally through local distributors, making this conversion easy to implement. In fact, Sanitary Services Company in Whatcom County is currently using B-20 biodiesel in all their garbage trucks.

In the long-term, the city should consider using biodiesel in all the diesel vehicles and equipment.

**Recommendation:** Use B20 in Garbage Trucks. Total eCO<sub>2</sub> reduction is 39 tons. Consider converting all diesel vehicles and equipment to biodiesel. The cost is variable – depending on the fluctuation in gas prices, biodiesel is comparable in price.

### ***Employee Commute***

1. *Develop a Trip Reduction Performance Program:* The state of Washington passed the Commute Trip Reduction law in 1991 to “reduce traffic congestion, air pollution, and fuel consumption through employer-based commute programs.”<sup>16</sup> In the nine largest counties, this program is mandatory for employers with over 100 employees. Skagit County is a non-participating county. Nevertheless, the City of Anacortes could develop its own commute trip reduction program for all city employees in collaboration with the recommended community-wide efforts to reduce the number of vehicle trips.

The Washington Department of Transportation offers funds of up to \$100,000 to employers to implement commute trip reduction programs. The City of Anacortes could thus apply for and obtain funding for its own program. The Human Resources Department would likely be the best administrator for this program.

It is recommended that the first step be to conduct an employee commute survey to better understand commute patterns. Indeed, the lack of this data was a significant challenge in conducting the base year and interim year inventories and would be very useful as the municipal inventory is updated in coming years.

Based on the 2005 employee commute data it is recommended that the city achieve a 10% reduction in the number of miles traveled to and from work by city employees by 2020. This could be achieved through encouraging employees to carpool and use alternate forms of transportation, such as public transport, walking, and biking. Additionally, a compressed work week and telecommuting provide further ways to reduce employee commute and are often considered job benefits by employees. A 10% reduction in miles traveled by city employees would reduce eCO<sub>2</sub> emissions by 24 tons.

**Recommendation:** Obtain funding from WSDOT to start a Trip Reduction Performance Program for city employees with a goal of 10% reduction in total employee commute figures. Total reduction of eCO<sub>2</sub> is 24 tons.

### ***Streetlights***

1. *Reduce Streetlight Energy Use:* It is recommended that the amount of energy used by streetlights is reduced by one-third. This reduction could be achieved through a variety of methods. Smaller bulbs could be used in the streetlights or the amount of time streetlights are on could be reduced. Unnecessary streetlight accounts could be eliminated altogether. In addition, LED technology is expected to be widely available for streetlights within the next several years. If the one-third reduction in streetlight energy usage is achieved as recommended, there will be an annual reduction of 113 tons of eCO<sub>2</sub>. Annual savings are expected to be significant because the cost for most of these accounts is based on bulb wattage, not on meter numbers. This cost includes expensive maintenance which would be reduced. Thus, at an average cost in 2005 of \$0.22/kwh, savings are expected to total \$50,189.

**Recommendation:** Reduce streetlight energy usage by one-third. Total reduction of eCO<sub>2</sub> is 113 tons with savings of \$50,189.

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<sup>16</sup> Source: Washington Department of Transportation,  
[http://www.wsdot.wa.gov/tdm/tripreduction/employee\\_surveys/employee\\_faq\\_online\\_survey.rtf](http://www.wsdot.wa.gov/tdm/tripreduction/employee_surveys/employee_faq_online_survey.rtf)

## *Waste/Sewage*

1. *Install more efficient and smaller pump motors:* Much of the energy use at the Waste Water Treatment Plant, the Water Treatment Plant, and their respective pump stations is used by motors, which are needed to deliver water and sewage services. However, many of these pumps are operating at or below optimum performance, according to Bob Hendrix, WWTP Operations Supervisor, and Willy LaRue, WTP Plant Manager. It is highly recommended that these motors be replaced by more efficient ones.

For example, at the Water Treatment Plant (WTP), there are eight 4160 volt motors on the pumps, dating from the 1950s and 60s. The WTP is planning on upgrading its facilities in the next several years and discussions with the pump manufacturers indicate that the motors could be downsized to 480 volts without harming service delivery. A smaller generator could also be used for these smaller, more efficient pumps. PSE offers a number of grant and incentive programs that can help offset the implementation cost of installing new motors.

**Recommendation:** Install more efficient pump motors at the Waste Water Treatment Plant, the Water Treatment Plant and their respective pump stations. These changes are expected to produce significant cost savings and reductions in eCO<sub>2</sub>.

2. *Purchase Green Power:* It is recommended that the water/sewage sector purchase at least one-fourth of their energy through Puget Sound Energy's Green Power Program (refer to the "Building" sector for a more complete explanation of this program). As the major consumers of electricity in municipal operations, it is expected that such a purchasing decision would result in energy savings and reductions in eCO<sub>2</sub> emissions. Using 2005 electricity figures for this sector (17,993,817 kwh), it was calculated that the municipality could purchase 4,498,454 kwh of green power annually. This purchase results in a total eCO<sub>2</sub> reduction of 2,222 tons. If one-half of this sector's energy came from green power sources, then there would be a total eCO<sub>2</sub> reduction of 4,444 tons.

**Recommendation:** Purchase at least one-fourth of this sector's electricity through PSE's Green Power Program. Total reduction in eCO<sub>2</sub> is 2,222 tons. Again the cost is a premium on current electricity prices at an additional cost of \$.01/kWh for purchases over 1 million kw hours.

3. *Install Appropriate Technology:* Existing equipment technology should be used to increase energy efficiency at the Waste Water Treatment Plant. The first of these is to resize the aeration blowers in the treatment process, which were oversized when the plant was built. According to Bob Hendrix, this means that the blowers could be reduced in size from the current 150 horsepower to 100 or even 75 horsepower. Additionally, a sludge drier would reduce the amount of stationary diesel used in the incinerator at the plant since the sludge would have less water content. Both these technologies are expected to reduce emissions and energy and fuel costs.

**Recommendation:** Resize the aeration blowers at the plant and install a sludge drier to reduce emissions and realize energy and fuel savings.

4. *Install LED exit lights at WWTP:* There are 19 exit lights at the Waste Water Treatment Plant. Assuming that these exit signs are replaced by Energy Star-rated LED exit lights, the City of Anacortes can expect to see a reduction of 25 tons of eCO<sub>2</sub>, in addition to \$3,565 saved in energy bills. With these kinds of savings, the payback period is very short. At the time of publication of this report, it is expected that these lights will be installed by the end of 2006.

**Recommendation:** Install LED exit signs at the Waste Water Treatment Plant. Total reduction of eCO<sub>2</sub> is 25 tons with savings of \$3565.

**Waste**

1. *Expand Municipal Recycling Program:* In 2001, municipal facilities contracted with Waste Management to begin a recycling program. This program deals primarily with mixed paper (mainly office paper and cardboard) at these sites. It is recommended that the municipal recycling program be extended to include other recyclables, especially glass, plastic, and aluminum. Additionally, the recycling program needs to be better coordinated, thereby increasing efficiency and effectiveness. Finally, the Maintenance Shop, which currently does not recycle, should be included in this initiative. As it is, the current program prevents almost 30 tons of waste from being sent to the landfill, reducing eCO<sub>2</sub> emissions by 89 tons.

**Recommendation:** Expand municipal recycling program to include glass, plastic, and aluminum and increase efficiency.

**Table 13: Proposed Municipal Greenhouse Gas Emissions Reduction Measures**

<b>Policy</b>	<b>Estimated Annual Tons eCO<sub>2</sub> Reduction</b>	<b>Estimated Annual Cost Savings</b>	<b>Recommended Timeframe</b>
<b>Buildings</b>			
<i>Green Power Purchase</i>	168	-\$6961 (Cost)	Long Term
<i>Resource Conservation Manager position</i>	353	\$50,000	Top priority recommendation
<i>Install LED Exit Signs</i>	36	\$5,491	Short Term
<i>Vending Machine Controllers</i>	2	\$349	Short Term
<b>Vehicle Fleet</b>			
<i>Purchase Hybrids</i>	2	\$550-600	Long Term
<i>Use Biodiesel in Garbage Trucks</i>	39	Variable	Long Term
<b>Employee Commute</b>			
<i>Reduce Employee Commute by 10%</i>	24	Variable cost/savings	Long Term
<b>Streetlights</b>			
<i>Reduce Energy Usage</i>	113	\$50,189	Short Term
<b>Water/Sewage</b>			
<i>Install Smaller Pump Motors</i>	Large	Not Available	Long Term
<i>Purchase Green Power</i>	2,222	Cost Premium of \$.01 or \$.02 per kwh	Long Term
<i>Install Appropriate Technologies</i>	Medium	Unknown	Long Term
<i>Install LED Exit Signs</i>	25	\$3565	Short Term
<b>Waste</b>			
<i>Expand Recycling at Municipal Facilities</i>	Small	Not Available	Short Term

Source: CACP Model output

## VII. Conclusion

Climate change is an issue of growing concern for communities across the United States and around the world. The City of Anacortes has displayed great leadership and foresight in choosing to confront this issue now. By reducing the amount of greenhouse gases emitted by its community, Anacortes joins hundreds of other American cities in stemming the tide of global warming and the numerous threats associated with it, such as reduced water supply, disrupted agricultural systems and rising sea levels.

In addition to mitigating the destabilization of the climate and associated effects, Anacortes stands to benefit in many other ways from the proposed measures outlined in this report. Some of these benefits include financial savings resulting from improved energy efficiency, increase in resultant health benefits, increased energy security and improved air quality. In addition, Anacortes stands poised to boost its local economy as a result of expanded demand for energy efficiency and green technologies.

Meeting Anacortes' reduction target will require both persistence and adaptability. The following sections outline how the Climate Action Plan can begin to be implemented in Anacortes.

### *A. Administration and Staffing*

A key part of effective measures implementation is assigning and defining management responsibilities for the individual components. An appropriate staff person within the city should be assigned overall responsibility for coordinating the implementation of the Climate Action Plan. This would be an ideal opportunity to create a Resource Conservation Manager position (see Proposed Measures). This position could be filled by a new staff member or by allowing an existing staff person to devote a portion of his/her hours to implementation of the plan. *This is considered the highest priority measure and the first action item.*

It is recommended that the Anacortes City Council establish a Community Committee to ensure effective communication and coordination between those responsible for the program's various elements. This Committee, composed of diverse representatives from the community, would support the efforts of the Resource Conservation Manager. The goals of this committee would be threefold: to educate the community and serve as a conduit for information about energy efficiency and renewable energy incentives and programs for the municipality and community, to comment on current and proposed municipal actions, and to recommend and coordinate actions in the private sector.

It is essential to the success of the Climate Action Plan that there are adequate resources to provide for its implementation. These resources include funding, and adequate staff or outside assistance. One possible way to use existing resources more effectively is to use volunteers or interns from the community to gather information or do public outreach. Indeed, Anacortes is lucky enough to already have an active group of citizens called "Beat the Heat," who are very interested in working with the City of Anacortes to continue education efforts and promote energy efficiency within the community.

The Climate Action Plan is an opportunity to renew and reinforce Anacortes' commitment to existing programs and projects that have the effect of reducing greenhouse gas emissions. By identifying them as key elements in the Climate Action Plan, measures that may, for one reason or another, have been languishing on the back burner can be brought back to life.

## *B. Financing and Budgeting*

Many opportunities will arise to incorporate measures into existing projects and expenditures, from right-sizing the municipal fleet to incorporating policies that encourage and enable transit in lieu of single occupancy vehicles. Some actions, such as encouraging Skagit Transit to add more buses or routes to expand transit use, may require significant time investments, whereas some, such as reducing number of vehicles in the municipal fleet or setting all computers on energy efficient sleep mode will require little time and no added expenditure.

Funds can be found from the existing municipal budget. Parking revenues, for instance, might be used to pay for alternative transit improvements, on the grounds that these improvements reduce parking demand. The energy-saving benefits of the measures Anacortes implements for the whole community will be vastly greater than the savings from local government operations, but they will accrue to the private sector, not to the local government. However, Anacortes can tap into some of these savings to fund program implementation through fees or surcharges on utility bills, building permits, and so on. Local needs and the political viability of this approach will affect pursuing such funding mechanisms.

When municipal resources fall short, there are a number of alternative resources, including financial arrangements with local utilities, assistance through federal and state programs, and energy service corporations (ESCOs). Puget Sound Energy has expressed interest in a variety of partnerships in this area. ICLEI and the Northwest Clean Air Agency are eager to help bring these efforts to fruition. Refer to Appendix B for additional resources.

## *C. Developing a Timeline*

The schedule for implementing the Climate Action Plan's programs and measures should be timely enough to get Anacortes to its goal by the target year. However, it should also be practical, taking into account the administrative, political, technical, and other issues involved in getting programs up and running.

The overall schedule should meet the target date set for meeting the greenhouse gas reduction goal, provide ample time for external review and input and put aside time for citizen involvement and input, committee and commission review as necessary. It makes sense to implement the simplest and easiest measures first. For projects or policies that will be more complicated or controversial, take the time needed to lay the necessary groundwork to develop the best possible recommendations and generate the strongest possible support, as well as integrating the schedule with existing processes and responsibilities

## *D. Public Involvement in the Implementation Process*

The implementation phase should continue to include strong public input, involvement, and buy-in. The Community Committee, convened by the City Council, should contain representatives from the community, but should also work with the existing community group called "Beat the Heat" to achieve these goals. Another key tool is to recruit volunteers and interns to assist in presenting the Plan to the public and helping in its implementation.

### *E. Monitoring*

To make sure the Climate Action Plan is implemented effectively and on schedule, it is important to include procedures for monitoring its implementation, measuring results, keeping track of changing conditions, taking advantage of new information and ideas, and so on. Measuring results is important. This requires following up on the sources and data developed in preparing the emissions analysis and forecast and monitoring to check if the figures change in the ways predicted. If figures do not change as predicted, resolve whether this is a result of inadequate program implementation, or the measures adopted were not sufficient. Tracking and measuring should be routine, so as to remain aware of the progress Anacortes is making.

One of the ways in which the Climate Action Plan can become incorporated into the larger municipal and community operations is by including the proposed recommendations in city-wide planning documents. These include the Capital Facilities Plan, the Comprehensive Plan, and the Transportation Plan.

### *F. Re-Inventory*

ICLEI encourages jurisdictions to conduct a re-inventory for their Community and Municipal buildings and operations. The re-inventory should be conducted either before the target year or at least at the target year so that Anacortes can quantify the emissions and compare it with the base year emissions. This will define progress in terms of greenhouse gas reduction and provide an opportunity to implement new measures or improve existing ones.

## Appendix A: Forecast Methodology

### Government Forecasting Methodology:

-Based on population increase, with the rationale being that as population increases, so to do the services of the government.

1. Anacortes 2000 population/Skagit County 2000 Population = % of Skagit population composed of Anacortes residents. Result: 14%

Skagit County population is 102979: <http://www.ofm.wa.gov/pop/gma/countypop.pdf>

Anacortes population is 14557:

<http://www.ofm.wa.gov/census2000/profiles/place/1605301990.pdf>

2. Skagit County 2020 population x .14 = Anacortes population in 2020.  
Result: 21,062.86

Skagit County 2020 population is 150,449:

<http://www.ofm.wa.gov/pop/gma/countypop.pdf>

3. 2020 Anacortes pop/2000 Anacortes pop = % total population increase during these years. Result: 1.456, rounded to 1.45%

So, increase all energy reports in 2000 base year in CACP software by 1.45 to get projected energy consumption in 2020.

### Community Forecasting Methodology:

These community estimates are a little bit higher than the estimates made in the Anacortes Comp Plan based on the Skagit Council of Governments projections, which project a population of 18,300 by 2015.

1. 2000 Anacortes population/2000 Skagit County population = Anacortes 2000 population/Skagit County 2000 Population = % of Skagit population composed of Anacortes residents. Result: 14%

Skagit County population is 102979: <http://www.ofm.wa.gov/pop/gma/countypop.pdf>

Anacortes population is 14557:

<http://www.ofm.wa.gov/census2000/profiles/place/1605301990.pdf>

2. Multiply this percentage (14%) by the projected Skagit County population figures in 5-year increments:

Year	Skagit Pop.	Anacortes Pop
2000	102,979	14,557
2005	113,136	15,839.04
2010	123,807	17,332.98
2015	135,717	19,000
2020	150,449	21,062.86



3. Get yearly population growth in Anacortes:

2005/2000 pop: 8.8% growth rate between 00-04

2010/2005 pop: 9.4% growth rate between 05-09

2015/2010 pop: 9.6% growth rate between 10-14

2020/2015 pop: 10.8% growth rate between 15-19

4. Divide % in Step 3 by 5, so each year between 2000-2004 annual growth rate is: 1.76

Each year between 2005-2009: 1.88

Each year between 2020-2014: 1.92

Each year between 2015-2019: 2.16

Average annual growth rate is: 1.93%

## **Appendix B: Resource List**

### **General Information**

ICLEI's Cities for Climate Protection Campaign: <http://www.iclei.org/index.php?id=800>

NW Clean Air Agency – Climate Change Programs:

<http://www.nwcleanair.org/aboveBeyond/bigPicture.htm>

Puget Sound Clean Air Agency –Regional Overview:

<http://www.pscleanair.org/specprog/globclim/#redugree>

Georgia Basin/Puget Sound International Airshed Strategy:

[http://www.pyr.ec.gc.ca/airshed/index\\_e.htm](http://www.pyr.ec.gc.ca/airshed/index_e.htm)

EPA Pacific Northwest: <http://www.epa.gov/region10/>

Pew Center on Global Climate Change: <http://www.pewclimate.org/>

### **Best Practices and Possible Measures**

*ICLEI Best Practices Guide:* [http://www.iclei.org/documents/USA/pubs/Best\\_Practices.pdf](http://www.iclei.org/documents/USA/pubs/Best_Practices.pdf)

*ICLEI Case Studies:* <http://www.iclei.org/index.php?id=2194>

*Puget Sound Energy's Green Power Program:*

<http://www.pse.com/solutions/businessGreenPower.aspx>

*Puget Sound Energy's Resource Conservation Manager Program:*

[http://www.pse.com/solutions/businessPDFs/3642\\_RCM%20Brochure\\_screen.pdf](http://www.pse.com/solutions/businessPDFs/3642_RCM%20Brochure_screen.pdf)

*Puget Sound Clean Air Agency's Roadmap for Climate Protection:*

<http://www.pscleanair.org/specprog/globclim/csp/pdf/rptfin.pdf>

*Database of State Incentives for Renewable Energy:* <http://www.dsireusa.org/>

*US Dept of Energy's Energy Efficiency and Renewable Energy:*  
[http://www.eere.energy.gov/states/state\\_specific\\_information.cfm/state=WA](http://www.eere.energy.gov/states/state_specific_information.cfm/state=WA)

*Consumer's Guide to Energy Efficiency and Renewable Energy:*  
[http://www.eere.energy.gov/consumer/your\\_home/](http://www.eere.energy.gov/consumer/your_home/)

*WA Energy Saving Performance Contracting ideas:* <http://www.ga.wa.gov/Eas/epc/ideas-occupant.htm>

*Oregon State Best Practices:* <http://www.orsolutions.org/index.htm>

*LEED (Leadership in Energy and Environmental Design):*  
<http://www.usgbc.org/DisplayPage.aspx?CategoryID=19>

*Built Green Washington:* <http://www.builtgreenwashington.org/>

*Climate Solutions:* <http://www.climatesolutions.org/>

## **Appendix C: Contacts**

### City of Anacortes: Main Contacts for CCP Project

#### *Program Assistant*

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#### *CCP Liaison*

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#### *Planning*

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#### *Finance*

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Lois Cassidy, 315, [loisc@cityofanacortes.org](mailto:loisc@cityofanacortes.org) (accounting clerk)

#### *Engineering*

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#### *Streets*

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#### *Water*

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#### *Vehicle Fleet*

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#### *Waste*

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*Water Treatment Plant*

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*Waste Water Treatment Plant*

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Community

*Northwest Clean Air Agency*

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*Citizen's Group*

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Evelyn Adams: (h) 293-4048, [eadams@fidalgo.net](mailto:eadams@fidalgo.net)

*Local Environmental NGO*

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Media

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Elaine Wilson (Anacortes American): [ewilson@goanacortes.com](mailto:ewilson@goanacortes.com)

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Commute Trip Reduction Program: Robin Hartsell, [hartser@wsdot.wa.gov](mailto:hartser@wsdot.wa.gov), 360-705-7000

-Spokane Contact: Aurora Crooks, [acrooks@spokanecounty.org](mailto:acrooks@spokanecounty.org), 509-477-7540

-Yakama Contact: Paige Scott, [scottp@yvcog.org](mailto:scottp@yvcog.org)

-Whatcom Contact: Susan Horst, [susan@wcog.org](mailto:susan@wcog.org)

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