



## *Whatcom County*

Executive Pete Kremen

# **Climate Protection and Energy Conservation Action Plan**

*September 2007*



*Serving Island, Skagit and Whatcom Counties*

*Compiled by Christina Reeves under the auspices of ICLEI – Local Governments for Sustainability for the Northwest Clean Air Agency and Whatcom County*

# Letter from the Executive

The issue of climate change can no longer be ignored. The chorus of scientific voices urging us to change our ways grows ever louder, and the time has come for us to take bold steps to reduce our impacts. No one person, community, or even one country can stop climate change alone; a concerted effort from people across this planet is needed to minimize the damage that is already occurring. However, each individual and community that accepts the challenge to prioritize the reduction of greenhouse gas emissions will bring us one step closer to effecting the change with which we are being tasked.

Therefore, I am grateful for the opportunity to assist Whatcom County in becoming a leader in the effort to reduce our impact. Throughout my time as County Executive I have always made environmental issues a priority. With this Plan, I am reinforcing my efforts with an even more specific goal in mind—to help our community find legitimate, cost-effective, local solutions to what may be the most critical issue of our time.

To enact the changes that will need to occur, a collaborative effort between Whatcom County and the cities, townships, businesses, and individuals within its borders will be required if we are to be successful. Although working through the details of finding enduring solutions will surely challenge us, it is my hope that it also serves to unite us.

Sincerely,

Pete Kremen  
County Executive

# Acknowledgements

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- Christina Reeves

For further information please contact:

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Alex Ramel, Project Coordinator, ICLEI, City of Bellingham, WA. [alex.ramel@iclei.org](mailto:alex.ramel@iclei.org)

Amy Shatzkin, Regional Program Officer, ICLEI Pacific Northwest Regional Capacity Center, Seattle WA, [amy.shatzkin@iclei.org](mailto:amy.shatzkin@iclei.org), (206) 615-1696

Laura Curley, Public Information Officer, Northwest Clean Air Agency, Mount Vernon WA, [laura@nwcleanair.org](mailto:laura@nwcleanair.org), (800) 622-4627

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# Whatcom County 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.** As former United Nations Secretary General Kofi Annan said in 2006, the time has come to “start being more politically courageous.” He also stated that “it is increasingly clear it will cost far less to cut emissions now than to deal with the consequences later.”<sup>13</sup>

These words came in response to scientific findings indicating that in the past 1000 years, the planet has not warmed at a faster rate than during the 20th century, and the most recent decade has been the warmest ever on record. Allowing this trend to continue could result in decreased agricultural output, increased catastrophic weather events such as forest fires, drought and floods; and displacement of entire populations due to rising sea levels. (Please see section I.A for more information about the science of climate change.)

**Whatcom County 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. Whatcom County released 2.4 million tons of carbon dioxide equivalent (eCO<sub>2</sub>) in 2001 and based on past practices would be projected to emit 35% more in 2020. However, on May 9, 2006, Whatcom County pledged to take action against this destructive trend by passing a resolution to join more than 200 U.S. local governments and 770 local governments worldwide in ICLEI’s Cities for Climate Protection® (CCP) Campaign. In so doing, we have committed to ICLEI’s Five Milestone Process to combat climate change:

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.

**The goal for the Whatcom County community is to reduce its emissions by 10% below 2001 levels by 2020. The County government will strive to reach an even more ambitious reduction goal of 40% below 2000 levels by 2012.**

### Whatcom County’s Climate Action Plan

In order to devise a plan for Whatcom County to reduce its greenhouse gas emissions, we needed to complete an inventory that would provide a baseline or starting point. For the community of Whatcom County, 2001 was chosen as the base year. After quantifying all community emissions from buildings, transportation, waste decomposition, and agriculture, the total County greenhouse gas emissions for that year equaled 2,750,728 tons eCO<sub>2</sub>. Without any effort to reduce these emissions, that number is expected to rise to 3,650,660 tons eCO<sub>2</sub> by the year 2020.

As a subset of that number, the emissions resulting from Whatcom County government activity totaled 10,318 tons eCO<sub>2</sub> in the base year of 2000. This included all the emissions from County facilities, streetlights and signals, the vehicle fleet, employee commute trips, and the decomposition of generated waste. If the County government were to grow in a business-as-usual pattern with no reduction measures, the emissions are forecast to reach 12,370 tons eCO<sub>2</sub> by 2012.

However, Whatcom County has already taken steps to reduce greenhouse gas emissions, as both a community and a government. In the community, people are implementing energy efficiency measures in their homes and businesses. Many are purchasing ‘green’ electricity that comes from non-polluting, renewable sources, and some are separating their waste so that the organic materials can be composted. As of spring 2007, there were 533 hybrid vehicles registered in Whatcom County, and approximately 300,000 gallons of biodiesel are now used in the

community each year. One farm, with the help of several partners, is even using cattle waste to produce clean electricity.

The Whatcom County government has also implemented many measures toward reducing its impact, and it is already more than 2/3 of the way toward the goal of 40% reduction by 2012. A large part of this reduction has been achieved through the 2006 decision to purchase 100% of the electricity for County operations from 'green' sources. In addition, further reduction has been made possible through energy efficiency measures in the Courthouse and Jail, which used almost 20% less energy in 2005 than in 2000. These measures have included upgrades to the lighting and HVAC systems as well as substantial improvements in energy management. In addition, the County performed five other lighting upgrades and transitioned to efficient furnaces and on-demand hot water heat in several facilities. Finally, the County has also implemented measures in the area of fleet vehicle use; it has purchased 16 hybrid vehicles for fleet use since 2002 and the Sheriff's office has restructured its patrol practices to substantially reduce unnecessary fuel use in its vehicles.

Despite these improvements, there are many more ways by which both the community and government of Whatcom County can reduce their emissions. In the community, a strong effort to improve the energy efficiency of people's homes and businesses will be a cost-effective next step forward. Savings from this effort can then support a continued growth in green power purchases. In the transportation sector, the community can purchase additional hybrid vehicles, transition to higher levels of biodiesel and ethanol use, and reduce the amount of fuel wasted by unnecessary vehicle idling. Individuals can also choose to use public transit, their bicycles, and carpooling options more often. Finally, the community as a whole can reduce emissions by supporting the installation of additional anaerobic digesters that use agricultural waste to generate electricity.

In the County government, the next steps are rather similar but on a smaller scale. The first of these is to continue County facility upgrades, especially in the areas of lighting and heating. The County has already resolved to build future facilities to LEED standard, which will save future energy costs and reduce emissions. In the area of fleet vehicle management, Whatcom County intends to begin using 20% biodiesel in its vehicles in the near future. For further reduction we could use ethanol, purchase additional hybrids, and work to reduce the overall miles that are driven by the fleet. Finally, the County is and will continue to actively encourage employees to use alternative transportation options, through both education and incentive programs.

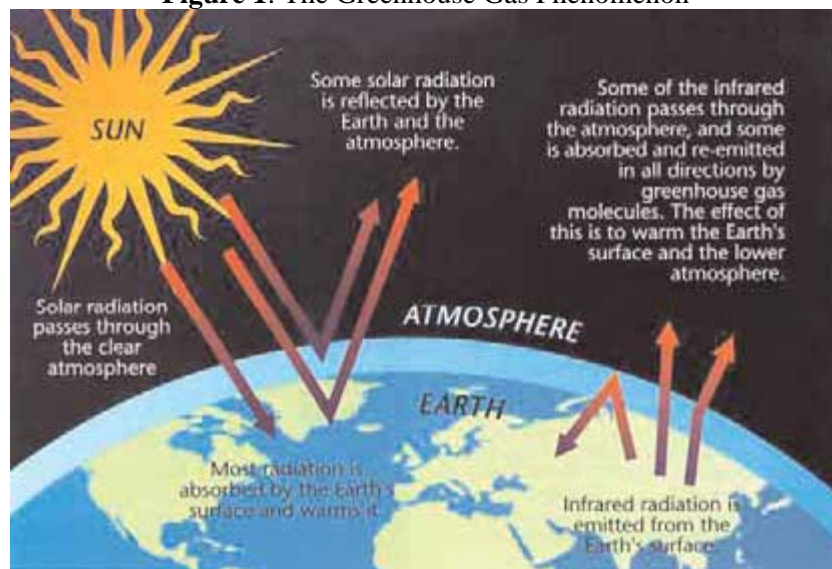
Overall, the choices made by the Whatcom County community and government have already brought us a long way toward reducing our greenhouse gas emissions. In fact, these efforts are bringing Whatcom County to the forefront as leaders in this movement. And although there remains much more to be done, we can envision a clear path by which to reach our goals. If a strong effort can be put forth and maintained, this community will substantially reduce its impact while also saving financial resources and improving community livability.

## 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 de-stabilizing effect on the global climate, fueling the phenomenon commonly referred to as global warming or climate change. The global average surface temperature increased during the 20th century by about 1°F.<sup>ii</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>iii</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

The climate and the atmosphere do not react in a linear fashion to increased greenhouse gases. Therefore, one 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 climate change 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. However 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>iv</sup> Another example of this compounding can be found in the polar ice caps. Ice is highly reflective and acts as a giant mirror, reflecting the sun's rays back into space. As the planet warms and some of this ice melts away, a darker land or ocean surface is revealed. This darker surface tends to absorb more heat, accelerating the effects of 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 climate change.

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

### **Global Impacts**

Changes in temperature and climate will have a dramatic impact on plants and animals currently 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 expected to heat by 40% above the mean increase.<sup>v</sup> In addition, rising levels of greenhouse gases will 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>vi</sup> These coastal infringements on such a large scale could lead not only to 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>vii</sup> (All subsequent mention of climate impacts in the 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 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 of depletion 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. This means 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.

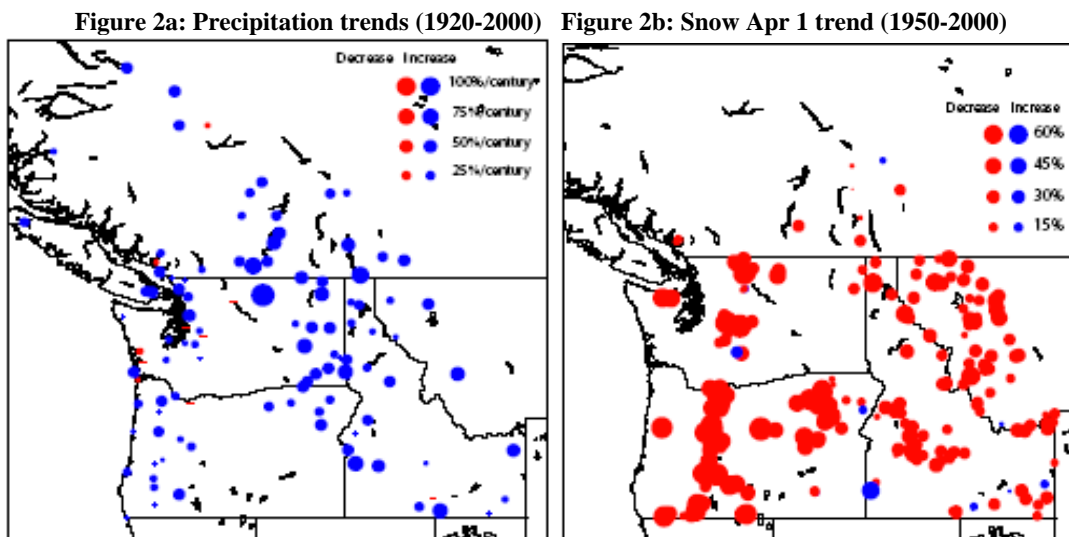
Near-shore habitat such as coastal wetlands and salt marshes are at risk of being inundated by rising sea levels. Likewise, increased flow and salinity of water resources would seriously affect the food web and mating conditions for fish that are of both economic and recreational interest to residents. 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 would be altered, as would the temperature conditions necessary for a thriving locally adapted agriculture. Perennial crops in particular will be challenged.

**Public health impact:** Warming temperatures and increased precipitation can encourage mosquito breeding, thus engendering diseases such as the West Nile virus, for which mosquitoes are vectors.

Increased temperatures also pose a risk to human health because they increase 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 particularly 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<sup>st</sup> snow pack.



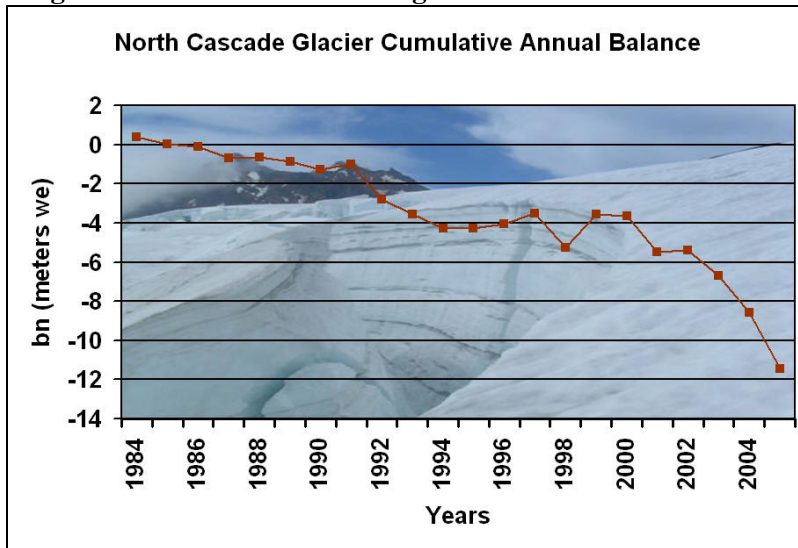
Source: Climate Impacts Group, University of Washington, 2006<sup>viii</sup>

These figures 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 dramatic and rapid enough to be visible with the naked eye.

Scientists have calculated a number of predicted increases in average temperature in the Northwest under ten different climate change study scenarios. Figure 4 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 within which two-thirds of the scenarios fall. The blue area indicates the full range of variability of all of the scenarios.

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



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

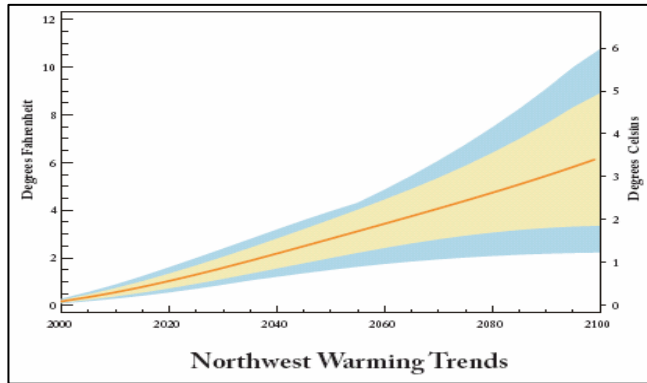
**Figure 3b: North Cascades Glacier Recession**



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

It is important to note that there is very little variability in short-term predictions of the average global temperature change. However, the long-term outcome is more variable because it will be governed by decisions made today. This 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 therefore unavoidable. But the long-term impacts that will be felt between 2040 and 2100 have a high range of variability depending on the actions we take in the present.

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



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

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

#### **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 effects of climate disruption. A survey published in 2003 found that legislatures in 21 states had passed legislation specifically directed at climate change.<sup>xi</sup> The laws most commonly covered by the survey fall into three categories: they call for studies of the impacts of climate change, require inventories of the states' greenhouse gas emissions, and they create 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 mitigate 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 that each state was independently pursuing. Examples include the bulk purchase of hybrid cars for state fleets and organized deployment of electrification technologies at truck stops throughout the I-5 corridor. The RGGI coalition has also set reduction targets for greenhouse gas emissions that result from electricity generation, and it is trying to establish a market-based regional cap-and-trade emissions program that will likely be in effect by 2009.<sup>xii</sup>

#### **Washington State**

Over the past three 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 any fossil-fueled thermal power plants with a generation capacity of 25 MW or more to provide mitigation for 20 percent of its CO<sub>2</sub> emissions over a period of 30 years.<sup>xiii</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, they 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, which requires 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 climate change related effort is being put forth at the local level 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 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, which subsequently funded this report.

Additionally, a national effort called the U.S. Mayors' Climate Protection Agreement (MCPA) was launched locally in 2005 by Seattle Mayor Greg Nickels. Its goal is to promote climate protection and the goals of the Kyoto Protocol, an international agreement addressing climate change pollution that has been ratified by 164 countries. Today the MCPA includes over 600 signatures of mayors representing millions of Americans in all 50 states and Washington, D.C. By signing the agreement, they have pledged that their 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 program, 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. There they 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 reducing their own emissions and realizing 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 climate change and air pollution emissions. 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

On May 9, 2006, Whatcom County adopted a resolution to take action for climate protection and officially joined ICLEI's Cities for Climate Protection Campaign.

## 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 United Nations 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 approximately 300 U.S. cities and counties to reduce their greenhouse gas emissions. However it is worth noting that, although the software provides Whatcom County with a sophisticated and useful tool, calculating emissions from energy use is difficult to accomplish with precision. 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. These data were entered into the software to create a community emissions inventory and a municipal emissions inventory. The community inventory represents all energy use within Whatcom County 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, the government is committed to action on climate change, and has a higher degree of control to achieve reductions in its own municipal emissions than those created by the community at large. Second, by proactively reducing emissions generated by our own activities, the Whatcom County government takes a visible leadership role in the effort to address climate change. This is important for inspiring local action in Whatcom County as well as for inspiring other communities.

The community inventory is based on the year 2001. The municipal operations inventory is based on the year 2000. The base years are different due to more complete information available for the community inventory in

2001. In addition, by 2001 Georgia Pacific in Bellingham had already undergone most of its closure, which means that community energy use for that year more closely reflects the current scenario than would 2000.

When calculating Whatcom County’s emissions inventory, all energy consumed in the County was included. This means that, even though the electricity used by Whatcom County residents is produced elsewhere, this energy and its associated emissions appear in the County 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.

**B. Inventory Results**

**Table (1): Whatcom County Base Year Emissions Summary**

Whatcom County Emissions Summary, Base and Interim Years		
Year	Community emissions (tons CO <sub>2</sub> )	Municipal emissions (tons CO <sub>2</sub> )
Base (2001, 2000)	2,750,728	10,318
Interim (2005)	3,033,169	10,128

Source: CACP Model output

**1. Community Emissions Inventory – Year 2001**

In the base year 2001, the community of Whatcom County emitted approximately 2,750,728 tons of eCO<sub>2</sub>. The largest emitter of CO<sub>2</sub> in Whatcom County was the Transportation sector, making up 37.5% of all emissions in the County. Table (2) and Figure (5) below show the breakdown of municipal emissions by source.

**Table (2): Whatcom County Community Emissions Summary**

Potential Sources	Equiv CO <sub>2</sub> (tons)	Energy (million Btu)
Residential	593,652	5,921,495
Commercial	416,157	3,705,220
Industrial	678,549	7,450,212
Transportation	921,775	10,709,750
Waste	-20,319	n/a
Agriculture (Other)	160,915	n/a
<b>TOTAL</b>	<b>2,750,728</b>	<b>27,786,677</b>

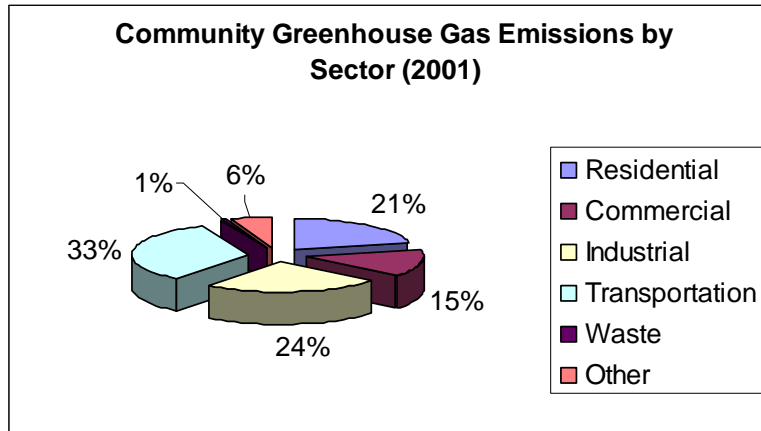
Source: CACP Model output

**Energy/Stationary Source Emissions**

Total stationary emissions include electricity, natural gas, and propane used in the residential, commercial, and industrial sectors. Stationary sources refer to emissions generated from fixed places or objects, such as buildings and homes, from which pollutants are released. In total, stationary emissions account for approximately 60% of all emissions in Whatcom County. The single largest stationary emissions source is residential electricity, which comprises 13.6% of all community emissions.

The industrial and commercial sectors together represent almost 40% of overall emissions. The manufacturing facilities in northwestern Whatcom County give the industrial sector a much higher contribution to emissions than the average community. In fact, industrial emissions are actually higher than shown in this report because electricity and/or natural gas usage information was unavailable for at least three industrial facilities.

**Figure (5): Whatcom County Community Greenhouse Gas Emissions – Year 2001**



Source: CACP Model output

### Transportation Emissions

The transportation sector is the largest single emitter of greenhouse gases in the County, representing 33% of the total. Eighty three percent of these emissions come from gasoline, while the other 17% come from diesel fuel use. Although these two pieces represent a large portion of the total inventory, they comprise a smaller percentage than than is contributed by our neighbors to the south. In the Puget Sound area, 50% of emissions come from transportation<sup>xiv</sup>. This is likely due to two factors, including the fact that people in Puget Sound tend to commute longer distances than people in this area, and that Whatcom County industry represents a larger proportion of emissions than in many other places, which makes the representative percentages of other sectors appear smaller.

One point to note is that marine vehicle emissions are not included in these numbers. This was purposely left out of the study due to the uncertainty involved in measuring marine fuel usage adjacent to the County versus that used for travel outside of the County.

### Solid Waste Emissions

Whatcom County solid waste emissions are a special case when compared with many other jurisdictions. The majority of Whatcom County waste is taken by truck and/or train to two landfills to the south: Columbia Ridge Landfill in Oregon and Roosevelt Landfill in Klickitat County, WA. In 2001, approximately 98,000 tons of waste was disposed in these two landfills.

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 usually occur in a landfill. First, the waste does not completely decompose, which causes 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, the landfill is a net source of greenhouse gas emissions. And in these cases, waste disposal can be a significant part of a community's climate pollution profile. Some solutions include capturing the methane to produce energy or burning it to convert it back to the less potent CO<sub>2</sub>.

Whatcom County's waste was sent to Columbia Ridge and Roosevelt Landfill, sanitary landfills with methane recovery factors between 56% and 80%. This means that the majority of what decomposes in the landfill and is released as methane gas is captured (or "recovered") at the landfill. In the County'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 Whatcom County, waste reduction does not need to 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.

**Other - Agriculture**

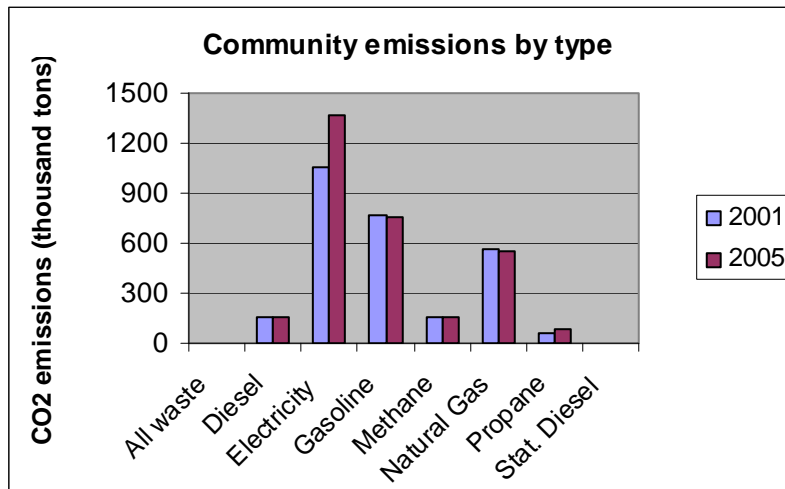
Another large source of greenhouse gas emissions in Whatcom County comes from agriculture. Although these emissions come from several agricultural sources and warrant further research, the only portion that was measured in this study was the methane released in relation to cattle farming. This is a considerable factor for two reasons: first, methane is 21 times stronger than CO<sub>2</sub> in terms of its heat trapping potential. Second, there are over 100,000 cows in Whatcom County, each emitting at least 160 lbs methane per year. Together, these two factors bring cattle emissions up to almost 6% of the overall emissions in Whatcom County (although this number could proportionally be somewhat lower when other aspects of agricultural production are examined).

**2. Community Emissions Comparison: 2001 versus 2005**

For the sake of comparison, a community inventory was also completed of emissions during the year 2005. In this interim year, most emissions sources were relatively similar to those in the base year (Figure 6). The one exception is electricity, which showed a rather large increase over the four year period. Over 70% of this increase was in the Industrial sector.

This apparent increase is most likely due to changes in the power supply of large users such as Georgia Pacific, Bellingham Cold Storage, and BP/ARCO after the 2001 energy crisis. At the time of this report all numbers are not yet available, but it appears that this is not actually a sharp *increase* in usage; instead, it is most likely evidence that in 2001 a substantial amount of electricity was purchased on the open market (for which it is much more difficult to gather data) rather than directly from Puget Sound Energy. Unfortunately, at the time of this analysis these data were not readily accessible for quantification.

**Figure (6). Whatcom County Community Emissions, 2001 versus 2005 by Source.**



Source: CACP Model output

**3. Municipal Operations Emissions Inventory**

In the base year of 2000, Whatcom County’s municipal operations generated 10,318 tons of eCO<sub>2</sub>. Similar to the Community data, stationary emissions from buildings make up the largest proportion of CO<sub>2</sub> emissions in the municipality, followed closely by fleet vehicles. However, when vehicle fleet and employee commute data are

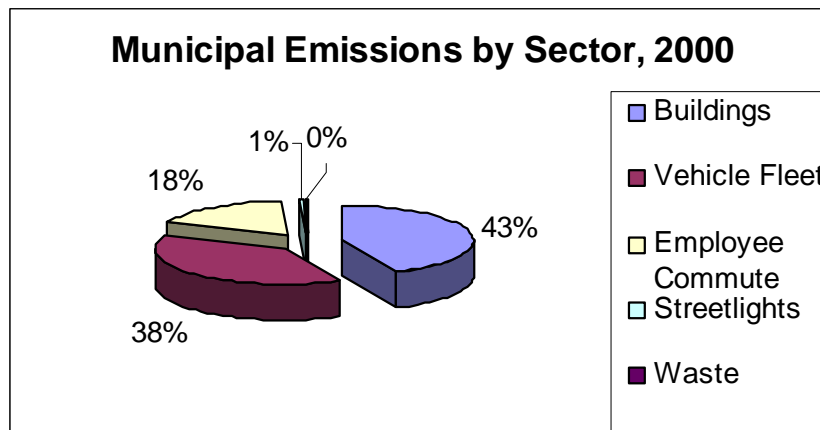
combined, emissions from transportation in the County government far exceed the other sources. Table (3) and Figure (7) show the breakdown of municipal operations emissions by source type.

**Table (3): Whatcom County Municipal Emissions Summary**

Potential Sources	Equip CO <sub>2</sub> (tons)	Energy (million Btu)	Cost (\$)
Buildings	4,510	40,691	615,757
Vehicle Fleet	3,943	45,721	419,369
Streetlights	59	394	16,293
Employee Commute	1,849	21,471	
Waste	-42	n/a	48,539
<b>TOTAL</b>	<b>10,318</b>	<b>108,278</b>	<b>1,099,958</b>

Source: CACP Model output

**Figure (7): Whatcom County Municipal Greenhouse Gas Emissions – Year 2000**



Source: CACP Model output

As is evident by comparing Tables (2) and (3), County government operations are a minor contributor to county-wide emissions. Therefore specific government actions to reduce internal energy use will have a limited impact on overall emissions in Whatcom County. However, municipal action has symbolic value and demonstrates leadership that extends beyond the magnitude of emissions actually reduced.

Energy/Stationary Source Emissions

For the government inventory, stationary emissions were comprised of energy use by all buildings owned and operated by the County, as well as energy used by the streetlights and traffic signals that are owned by Whatcom County. Buildings represent the largest proportion of eCO<sub>2</sub> emissions in the government (43.7%). This number includes all the County facilities, from the Courthouse and Jail (the two largest) to the outbuildings run by the Parks Department. Seventy-five percent of the emissions from these facilities come from electricity; natural gas and propane are both smaller greenhouse gas sources and lesser proportions of County energy needs.

Transportation Emissions

The emissions from transportation in the Whatcom County government can be broken down into two sections: fleet vehicle usage and employee commute. Taken separately, they are both smaller than emissions from stationary sources. However, when taken together these mobile sources represent over half of municipal emissions (56%). Within the vehicle fleet there are three predominant fuel users, which are Maintenance and Operations, the Sheriff’s office, and diesel used by the Lummi Island Ferry.

Regarding employee commute, in the year 2000 County staff commuted an average of 7-9 miles each way to get to work. This varied somewhat depending on the work location. Specifically, employees who worked in downtown Bellingham had a shorter commute and/or used alternative modes of transportation more frequently than those who worked in more rural locations.

**Solid Waste Emissions**

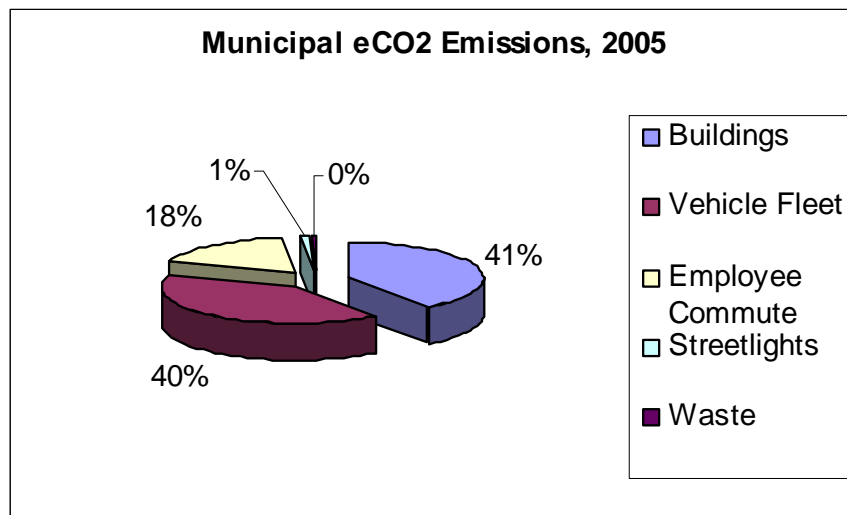
In the year 2000, estimated total waste generation by County employees was 186 tons, which represents approximately 0.24 tons per employee per year (0.37 tons before recycling). This number is very similar to the results of a California waste study, which estimated municipal employee waste to be 0.36 tons per employee before recycling<sup>xv</sup>.

As with the community data, this total actually represents a *negative* contribution to County greenhouse gas emissions once disposal methodology and methane recapture are taken into account.

**4. Municipal Emissions Comparison: 2000 versus 2005**

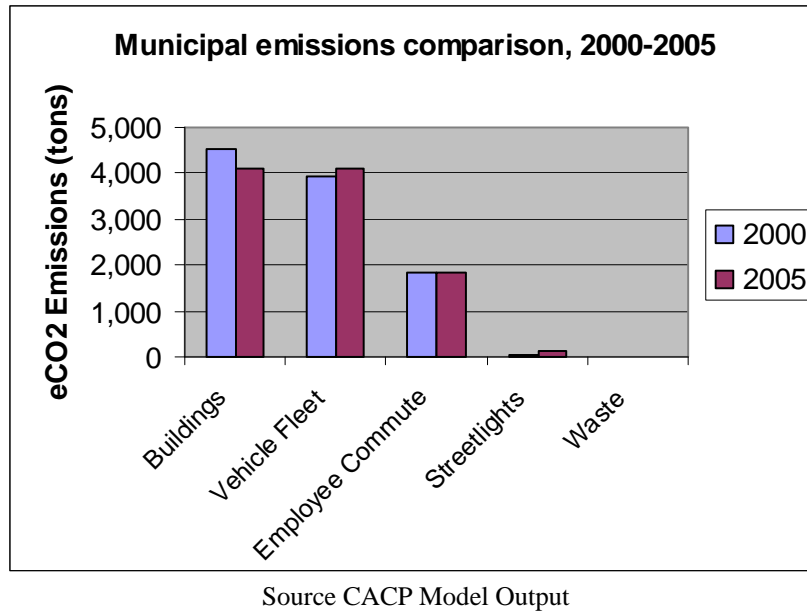
An interim year inventory was also completed for the Government sector [Figure (8)]. As seen in Figure (9), this time period showed an overall decrease in emissions. This decrease is evident in emissions from electricity, natural gas, and a slight decrease in diesel consumption. The only significant increase during this period was in gasoline use. There was, however, also an increase in the electricity used by streetlights due to the addition of new lighting in three separate districts in 2001. As will be shown in later sections, annual growth in County operations could have accounted for an increase in all sectors. However, this was not the case because efficiency-related efforts in County facilities have decreased the emissions from electricity and natural gas.

**Figure (8). Whatcom County Government Emissions, 2005**



Source CACP Model Output

Figure (9). Whatcom County Government Emissions, 2000 versus 2005 by Source.



### III. Forecast for Greenhouse Gas Emissions

Based on the community and municipal emissions inventories developed for Whatcom County for the base years of 2001 and 2000, a forecast of future emissions was generated for the two sectors. This forecast represents a business-as-usual prediction of how greenhouse gas (GHG) emissions will likely change without a shift in policy, and it is used to provide an emissions level against which a targeted reduction goal (see section IV) can be measured.

The forecast year for municipal operations was chosen to be 2012 for two reasons. First, the majority of potential reduction measures could be realistically implemented over the six-year period between 2006 and 2012. Since the forecast year and target year are generally the same, there was no need for a longer progress period. A second reason for choosing 2012 was that ICLEI often recommends setting a municipal goal that is sooner than that for the community so government measures can serve as a model for the community. This was an additional incentive to choose a closer municipal forecast and target than that for the community.

The municipal forecasted growth was based on the 2002 ECONorthwest study entitled, “Whatcom County Population and Economic Forecasts.” In this document, the mid-level projected population growth rate is 1.5% per year from 2002 to 2022. Since County FTEs grow with the population, the assumption was made that all sectors of municipal emissions would grow at the same rate. This resulted in an expected overall growth of 19.56% between 2000 and 2012.

The community forecast year was chosen to be 2020, largely because this brings the forecast almost to the end of current County planning horizon (2022). It also allows time for the community to see the benefits of municipal action and it promotes longer-term incorporation of reduction measures into the growth of the community. For this forecast, more specific rates of change were calculated based on annual predictions from the US Energy Information Administration. The EIA calculates expected growth in each sector by energy type, incorporating regional (Pacific Coast) population growth as well as trends in energy use. The data from the study were recalculated to fit with expected population growth in Whatcom County, and the subsequent growth rates were used to determine forecasted usage of each type of energy.

The largest expected growth for residential, commercial, and industrial sectors is in liquefied petroleum, or propane. In the residential and commercial sectors, propane use is expected to grow at 2-3 times the population growth rate and as much as 5 times as fast in the industrial sector. However, the projected growth in propane may be based on factors that do not affect this area, so further study would be required to ensure that this projection is accurate. In addition to propane, diesel fuel use is expected to increase twice as fast as the population. For all other energy sources, growth is expected to be within 0.5% of population growth (1.0-2.0% per year).

**Table (4): Whatcom County Emissions Forecast from Base Year to Target Year**

Whatcom County Emissions Forecast		
	Community Analysis	Municipal Operations Analysis
Base Year	2001	2000
eCO <sub>2</sub> Emissions, Base Year (tons)	2,750,728	10,318
Target Year	2020	2012
Forecasted eCO <sub>2</sub> emissions in Target Year (tons)	3,650,660	12,370

Source CACP Model Output

## IV. Greenhouse Gas Emissions Reduction Target

A reduction target provides a tangible goal for Whatcom County’s emissions reduction efforts. This emissions reduction target represents a percentage by which the community aims to decrease emissions, below the baseline, by a target year.

Many factors were considered in developing a recommendation for Whatcom County’s reduction target. We strove to choose a target that is both aggressive and achievable given local circumstances. A major factor is the fact that Whatcom County’s population and emissions are growing at a rapid rate, making it a challenge simply to keep community-wide emissions stable over time.

Other local factors considered in selecting the recommended target included: 1) estimation of the effects of implemented and planned programs and policies, 2) an approximate assessment of future opportunities to reduce emissions, 3) targets adopted by peer communities, and 4) emissions reductions expected to result from policies mandated by the state of Washington.

With a forecast year of 2020, almost two decades’ growth will be incorporated into the reduction goal for community emissions. Therefore, because the County’s emissions are forecast to grow by almost 35% between 2001 and 2020, a reduction target of 10% was chosen. To reach this target, the community will have to reduce its annual CO<sub>2</sub> emissions by 1.1 million tons by the year 2020.

For the municipal target, however, an alternative tactic was used for selecting the proposed reduction target. Because a much closer target year was proposed (2012), emissions are only expected to grow by 19% during the interim period. Moreover, it will be easier for the County government to reduce emissions resulting from its own activities than to impact those of the larger community. Therefore, a more aggressive target of 40% seems feasible. To reach this target, Whatcom County government must reduce annual emissions by 6,179 tons per year by 2012.

**Table (5) : Whatcom County Target Emissions Summary**

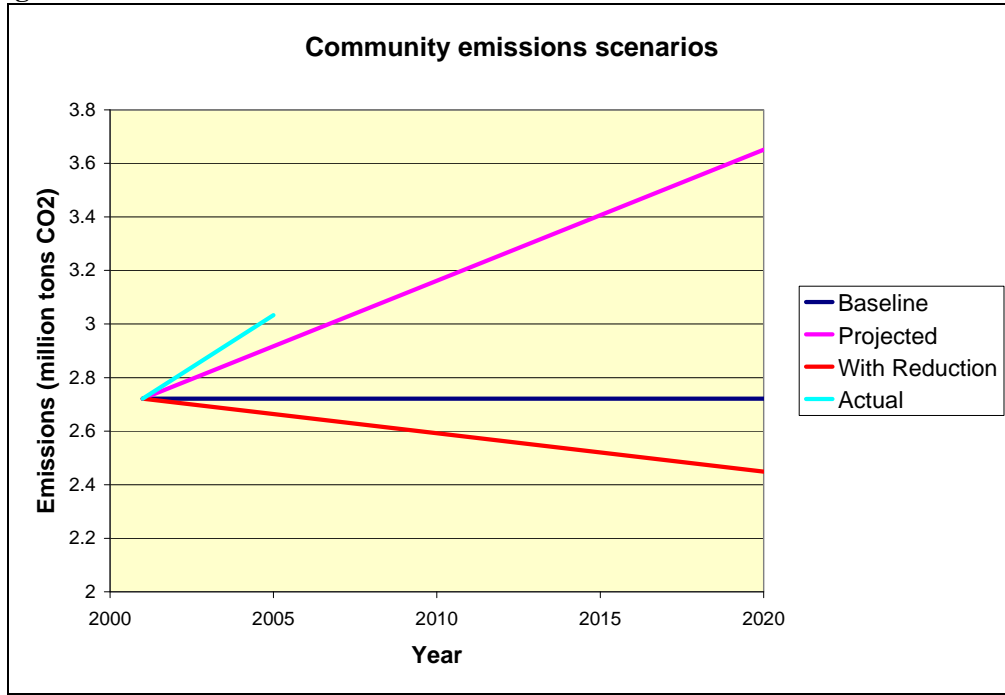
Whatcom County Emissions Summary		
	Community Analysis	Municipal Operations Analysis
Base Year	2001	2000
eCO <sub>2</sub> Emissions in Base Year (tons)	2,750,728	10,318
Target Year	2020	2012
Business-as-usual projection of eCO <sub>2</sub> emissions in Target Year (tons)	3,650,660	12,370
Targeted % eCO <sub>2</sub> reduction below baseline year emissions	10%	40%
Total % of eCO <sub>2</sub> reduction needed to reach target	33%	50%
Quantity of eCO <sub>2</sub> Reduction targeted (tons)	1,175,005	6,179

Source CACP Model Output

Below, Figures (10) and (11) show both community and municipal emissions based on the differing ways that Whatcom County chooses to address its greenhouse gas output. Note that in Figure (10), the 2005 actual emissions

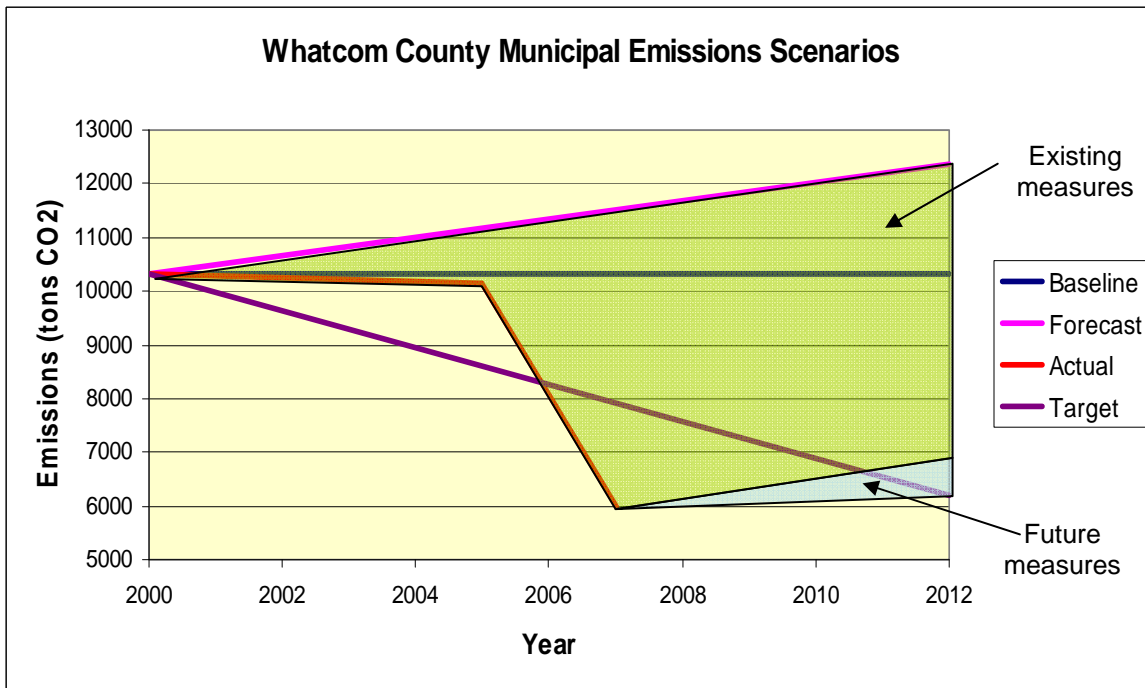
are higher than the forecast emissions. As explained above, this is likely due to inconsistencies in the electricity data received from County industry and probably does not represent an actual increase in emissions.

**Figure (10). Comparison of Community Emissions based on: No Change (baseline), Forecast, Actual (2001-2005), and Target.**



Source: CACP Model output

**Figure (11). Comparison of Government Emissions based on: No Change (baseline), Forecast, and Target.**



Source: CACP Model output

## V. Existing Measures

At both the community scale and within municipal operations, Whatcom County has already undertaken a number of programs, policies, and projects resulting in reduced greenhouse gas emissions. This section provides a detailed description of the actions currently in place.

### A. Existing Community-Scale Measures

This community has already implemented several measures that have resulted in reduced greenhouse gas emissions relative to the base year of 2001. These measures are an excellent first step towards significant reduction of greenhouse gas emissions in Whatcom County. According to estimates produced using the CACP software, these measures already account for 56,197 tons eCO<sub>2</sub> reduction, or 4.78% towards Whatcom County's ultimate reduction goal. These measures have been broken down by sector and are outlined below.

**Table (6): Existing Community Greenhouse Gas Emissions Reduction Measures**

Measure	Year Initiated	Tons of eCO <sub>2</sub> Reduced annually	% of Total Reduction Needed to Reach Goal	Project Contact
<b>Residential</b>				
<i>Green tag purchase</i>	2001	7015	0.60%	Heather Mulligan, PSE
<b>Commercial</b>				
<i>Large-Volume Green Power Purchases</i>	2006	32,014	2.72%	Various
<i>Federal Building, Energy Star certified</i>	2000	292	0.02%	Michael Okoro
<b>Industrial</b>				
<i>Post Point Pollution Control facility - upgrades</i>	2000	86	0.01%	Larry Bateman, Operations Supervisor
<b>Transportation</b>				
<i>Biodiesel purchase</i>	2004	3023	0.26%	Whole Energy Fuels
<i>Hybrid vehicle purchase</i>	2002	1,325	0.11%	Judy Abern, WA DOL
<b>Waste</b>				
<i>FoodPlus recycling</i>	2004	1,079	0.09%	Rodd Pemble, SSC
<b>Other/Agriculture</b>				
<i>VanderHaak Biodigester</i>	2005	11,363	0.97%	Craig Frear, WSU Extension
<b>Total reduction</b>		<b>56,197</b>	<b>4.78%</b>	

Source: CACP Model output

The largest reduction in community emissions thus far has come from green power purchases through Puget Sound Energy. The three largest purchases of green power are Western Washington University, the City of Bellingham, and Whatcom County. As of spring 2007, the community-wide green power purchase including those organizations was about 6.8 million kWh/year.

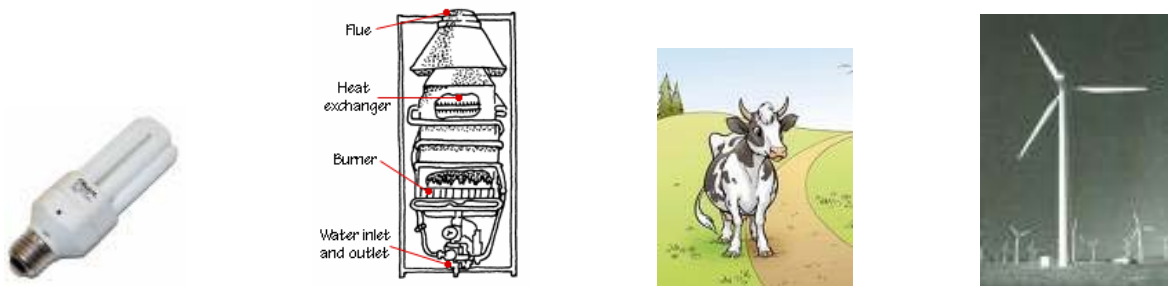
Another important piece of community CO<sub>2</sub> reduction thus far has been through energy efficiency measures in private homes and businesses. To a large degree, these measures were unable to be quantified in the scope of this



study; those listed in Table 6 are the few for which data could be compiled. For example, Alcoa Intalco Works has laid out ambitious energy conservation goals for its Ferndale operation, but specific information about those efforts was unavailable. Therefore, it is likely that Whatcom County as a community is further toward its overall reduction goal than was able to be measured in this report.

The two key transportation related measures that have been implemented in Whatcom County are biodiesel fuel use and hybrid vehicle purchase. As of July 2007, Whatcom County’s residents and businesses were using 300,000 gallons of B100 biodiesel annually, reducing CO<sub>2</sub> emissions by 3023 tons. In addition, there were 533 registered hybrid vehicles in this community which, if driven 12,000 miles per year, already reduce our total CO<sub>2</sub> emissions by 1,325 tons.

Finally, a large emissions reduction measure that has been recently undertaken in Whatcom County is the VanderHaak Dairy anaerobic digester in Lynden. The digester uses methane emissions from cattle waste as an energy source, simultaneously generating green power and preventing the emission of over 11,000 tons of eCO<sub>2</sub> into the air. And this number accounts for only the reduction in agricultural methane; eCO<sub>2</sub> reduction from generated green power is counted at the point where that electricity is used in place of fossil-fuel based power.



**B. Existing Municipal Operations Measures**

Whatcom County’s municipal operation has also undertaken several measures to reduce greenhouse gas emissions relative to the base year of 2000. These measures are an excellent first step towards significant reduction of greenhouse gas emissions from municipal operations. According to estimates produced using the CACP software, they already account for 4,330 tons annual eCO<sub>2</sub> reduction, or 70% towards the County’s municipal operations reduction goal. These measures have been broken down by sector and are outlined in Table (7).

The largest emissions reduction thus far is the result of the September 2006 Council Resolution to purchase 100% green power for County operations. This measure alone takes Whatcom County 2/3 of the way toward its goal of 40% emissions reduction by 2012.

Another notable reduction in greenhouse gas emissions has been due to upgrades to the Courthouse and County Jail. With the help of the Facilities Department, since 2000 these buildings have had lighting retrofits and partial HVAC upgrades, as well as installation of high-efficiency pumps, drives and motors. These facilities have also been the focus of intensive energy management. Together, these measures have saved 830,000 kWh of electricity and 16,000 therms of natural gas annually, which reduced carbon emissions by 102 tons/yr and avoid at least \$75,000/yr in utility bills.

**Table (7): Existing Municipal Greenhouse Gas Emissions Reduction Measures**

Measure	Year Initiated	Tons eCO <sub>2</sub> Reduced annually	% of Total Reduction Needed to Reach Goal	Project Contact and Department
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<b>Buildings</b>				
<i>Courthouse/Jail upgrades – lighting, HVAC, pumps, fans, etc.</i>	2002-2005	102	1.65%	Mike Russell, Facilities
<i>High-efficiency furnaces in Parks facilities (6)</i>	2001-2005	6	0.10%	Michael Chiavario, Parks
<i>Green Power Purchase - 100% of usage</i>	2007	4,096	66.29%	County Council, Executive Kremen
<b>Fleet</b>				
<i>Hybrid Priuses (14)</i>	2002-2005	13	0.21%	Eric Schlehber, M & O
<i>De-centralized Sheriff</i>	2003	113	1.83%	Carey James, Sheriff's Office
<b>Total reduction</b>		<b>4,330</b>	<b>70.08%</b>	

Source: CACP Model output

Other upgrades to County facilities since 2000 included 5 lighting retrofits as well as the addition of 6 high-efficiency furnaces and 4 on-demand hot water heating systems. In fall 2006, Whatcom County installed occupancy sensors on all refrigerated vending machines, a measure that saves \$150 in electricity per machine. Together, these save an estimated \$18,983/year and prevent the emission of 6 tons of CO<sub>2</sub>. *Note: the reduction for these upgrades, as well as those for the Courthouse and Jail, would be significantly higher if the County were not purchasing 100% green power. This purchase effectively brings electricity-related emissions to zero; therefore, reductions associated with these measures are only from natural gas usage.*

In addition, two significant measures have been taken to reduce the impact of County transportation. First, since 2002 the County has purchased 16 hybrid Toyota Priuses, which have thus far averaged over 42 mpg. Although their usage has not been extremely high, they currently prevent the emission of an estimated 13 tons CO<sub>2</sub> per year compared to the average passenger vehicle. Second, the Sheriff's Office has re-organized significantly since 2000. Because the patrollers no longer drive in to the Courthouse for each shift, they have saved an estimated 10,000 gallons of gas and 113 tons of CO<sub>2</sub> annually.

Quantifying the emissions reductions achieved from these existing measures has enabled Whatcom County to determine how far we have come in approaching our target and how far we have left to go. With a reduction target of 40% below the 2000 emissions level, we will have to reduce 1,849 additional tons of eCO<sub>2</sub> emissions to reach our goal.



**Table (8) : Whatcom County Emissions Summary**

Whatcom County Emissions Summary		
	Community Analysis	Municipal Operations Analysis
Base Year	2001	2000
eCO <sub>2</sub> Emissions in the Base Year (tons)	2,750,728	10,318
<b>Target Year</b>	2020	2012
Business-as-usual projection of eCO <sub>2</sub> emissions in Target Year (tons)	3,650,660	12,370
Total % eCO <sub>2</sub> reduction Targeted (from forecast year)	33%	50%
Quantity of eCO <sub>2</sub> Reduction Targeted (tons)	1,175,005	6,179
Total eCO <sub>2</sub> emissions reduction achieved to date	56,197	4,330
<b>% eCO<sub>2</sub> emission reduction pending to reach the goal</b>	95%	30%
<b>Quantity of eCO<sub>2</sub> emission reduction pending to reach the goal (tons)</b>	1,118,808	1,849

Source CACP Model Output

### *C. External Measures*

In addition to emissions reduction measures implemented within our community, the effects of legislation recently enacted at the state and federal level also deserves consideration in the context of our greenhouse gas emissions inventory. For the most part, these have not been integrated into the emissions reductions for Whatcom County shown above because they are imposed from outside of the community. However, actions at other levels do warrant recognition and have thus been outlined below.

For example, several policies were recently passed by the Washington State legislature. In 2004, the Washington legislature passed SHB 3141, requiring large fossil-fuel fired power plants to gradually offset the carbon emissions in their energy supply. Currently they must reach 20% reduction over a period of 30 years. This means that, over time, a larger and larger share of the energy electrifying homes and businesses in Whatcom County will be generated either cleanly or with carbon offsets. It is estimated that this change will decrease community emissions by 8.6% and municipal emissions by 6.7% from baseline levels.

On a national level, automobile manufacturers are bound by fuel efficiency standards set by the Department of Transportation. These standards, known as “CAFE” (Corporate Average Fuel Economy standards), require that the fleet of passenger cars sold by any single manufacturer have an average fuel economy of 27.5 mpg. This standard is the same today as it was in 1985, despite technical progress and increased understanding of the environmental impacts of fossil fuel combustion. However, these are federal standards and states are prevented from passing laws addressing vehicle fuel economy. In response to the stagnant standards the California Assembly passed AB 1493, known as the Pavely Amendment, which allows the California Air Resources Board to create carbon dioxide emissions standards for cars sold in California. They argue that a greenhouse gas emissions standard is distinct from a fuel economy standard. In 2005 the California automobile standards, including the Pavely Amendment, was adopted by the legislature for the state of Washington. If this standard goes into effect, the reduction in fuel consumption will reduce community emissions in Whatcom County by 2.5 to 5.4 percent and municipal emissions

by 0.3 to 0.6 percent from the baseline year.

However, this legislation is currently being challenged in court by car manufacturers, who suggest that the state is interfering with the federal CAFE standards. Therefore, the County should not consider these reductions to be definite, and should play an active role in supporting regulatory development of stronger automobile fuel economy standards.

In 2006, the Washington State Legislature passed SSB 6508, which requires the transition to using biodiesel and ethanol as part of the State Fuel Mix. The required percentage of these fuels will grow over time as agricultural supply of the necessary feedstocks becomes adequate. If the goal of 5% biodiesel and 10% ethanol is reached, this will reduce CO<sub>2</sub> emissions in the community by 3.4% and in the municipality by 4.7% below the baseline year.

Most recently, in November 2006 Washington State voters passed I-937, the “clean energy initiative.” This will require energy providers to incorporate a growing percentage of renewable sources into their energy portfolios. If this and other statewide measures are put into effect, Whatcom County residents may not notice these changes in their day-to-day life. However, these measures will have the potential to significantly impact both county and state greenhouse gas emissions.



## VI. Proposed Emissions Reduction Measures

In order to choose the most beneficial and feasible greenhouse gas emissions reduction measures for this community, careful consideration was given to the distribution of emissions within the community, the resources available, and the potential costs and co-benefits of each measure. CACP Software was used to calculate the greenhouse gas reductions both in tons and percentage. In addition to reducing GHG emissions, these measures will serve other purposes such as reducing particulate pollution by 29% below the baseline year and saving the community upwards of \$19 million in utility bills and fuel expenditures. The measures have been broken down by sector and are described below.

### A. Community Measures

In addition to greenhouse gas reduction measures that have already been implemented, there are many measures that are currently in the process of becoming a reality. These include growth in green power purchases, several commercial and residential buildings in the process of LEED certification, and steady growth in both hybrid vehicles and biodiesel use in Whatcom County.

**Table (9): Proposed Community Greenhouse Gas Emissions Reduction Measures**

Measure	Proposed Program Start Year	Tons eCO <sub>2</sub> Reduced Annually (2020)	% of Target Reduction by 2020
<b>Residential</b>			
<i>Green Power</i>	2006	99,490	8.47%
<i>Energy Efficiency Challenge</i>	2007	80,032	6.81%
<i>LEED Buildings (current)</i>	2006	51	0.01%
<b>Commercial/Industrial</b>			
<i>Green Power</i>	2006	117,496	10.00%
<i>LEED Buildings (current)</i>	2006	174	0.01%
<i>Energy Efficiency Challenge</i>	2008	97,345	8.28%
<b>Transportation</b>			
<i>Biodiesel, ethanol sales</i>	2007	150,139	12.78%
<i>Hybrid vehicle purchases</i>	2007	25,976	2.21%
<i>No-idling policy</i>	2008	8,399	0.71%
<i>Bellingham Mode Shift Goal</i>	2006	17,281	1.47%
<i>Whatcom Transportation Authority Expansion (outside Bellingham)</i>	2005	484	0.04%
<b>Waste</b>			
<i>Growth in Community Composting</i>	2007	13,089	1.11%
<b>Other/Agriculture</b>			
<i>Additional Anaerobic Digesters (3)</i>	2009	34,089	2.9%
<b>Total Quantified Reduction from Proposed Measures</b>		<b>644,045</b>	<b>54.81%</b>
<i>Total Reduction, Current Measures</i>		56,197	4.78%
<b>Total Reduction from Current and Proposed Measures</b>		<b>694,802</b>	<b>59.13%</b>

Source: CACP Model output

There are also several proposed measures that will help the County to reach its goal of 10% reduction below 2001 levels by 2020. These quantified measures, together with current and upcoming measures, equate to over 59% of the target reduction [Table (9)].

These measures will provide the necessary first steps toward our emissions target, especially in conjunction with imminent changes due to State legislation. In addition, the 14 years between this report and the target year can be expected to reveal additional measures that have not yet been considered.

## **1. STATIONARY - BUILDINGS IN ALL THREE SECTORS**

### **A. Green Power Use (216,986 tons CO<sub>2</sub> reduction)**

**Importance/Context-** In 2005, electricity comprised almost half of the overall CO<sub>2</sub> emissions in Whatcom County. Therefore, a reduction in the fossil fuel content of the electricity we use would have a tremendous impact on overall County emissions. Puget Sound Energy is currently working to increase the renewable energy component of its power portfolio in two ways. First, the company has been trying to independently build its green power portfolio in anticipation of I-937 (an initiative passed in November 2006 that will require energy providers in Washington to gradually increase their non-fossil fuel based energy component). In addition, PSE offers consumers the ability to pay a premium on their electricity that is applied toward green power purchase (called green tags). These green tag purchases will go toward a green power mix that is over and above the level required by law.

**Implementation Scenario** – This measure assumes that by 2020, Whatcom County will be powered by 20% green electricity in the residential sector, 15% in the commercial sector, and 10% in the industrial sector. This will occur partly through the purchase of Green Tags and partly through an increase in the green power used by the County's electricity providers. As I-937 is implemented, the actual green component of our power is likely to far exceed these estimates.

**Emissions Reductions-** If Whatcom County's electricity comes from 10-20% green power by 2020, varying by sector, this will lead to a 216,986-ton reduction in County eCO<sub>2</sub> emissions overall.

**Co-Benefits-** If this level of green electricity use can be achieved, it will likely also allow a reduction in the need for fossil fuel-fired power plants to service the Pacific Northwest. A reduction in coal burning would lead to a concurrent reduction in particulate and other types of pollution that are associated with fossil fuels. In addition, it would improve American energy security and promote our economy through jobs based in local energy production.

**Costs** – If rates for green power purchase remain steady and all of the increase in green power came from Green Tag purchase, the cost to the Whatcom County community would be \$4.64 million per year. The majority of this cost would fall on the residential sector, for which the price of Green Tags is \$0.0125/kWh instead of \$0.006/kWh for the large purchasers.

### **B. Energy Efficiency Challenge (177,377 tons CO<sub>2</sub> reduction)**

**Importance/Context-** Energy efficiency is the easiest, most cost-effective way to reduce greenhouse gas emissions. A large portion of efficiency measures can be implemented without any additional cost, such as turning off lights and appliances when not needed, turning down heat or air conditioning when a building is empty and regular flushing of hot water tanks.

This measure recommends that Whatcom County lead the community to a 10% reduction in overall energy use from the base year. Success of this measure will save money, energy, and greenhouse gas emissions simultaneously.

**Implementation Scenario** – If Whatcom County were to launch a County-wide Energy Efficiency Challenge, it would champion a movement toward the most cost-effective way to reduce the community's overall carbon emissions. This would require employee time to organize and publicize the effort, which could be modeled after the national Energy Star Challenge (more details can be found at: [http://www.energystar.gov/index.cfm?c=news.nr\\_spring2006#2](http://www.energystar.gov/index.cfm?c=news.nr_spring2006#2)). This measure would also require a system

whereby creative and interesting awards are given to the homes, businesses, and even industries with the largest resultant savings. To reach this goal, new structures that are built with efficiency in mind could also qualify as part of the Challenge.

There are a number of communities in Whatcom, Skagit and Island Counties that are considering such challenges. Therefore, it might be feasible to coordinate a multi-jurisdictional effort with PSE and the Northwest Clean Air Agency. Such an effort would manifest economies of scale, reduce costs to individual organizations and expand the scope of the impact. Because of Whatcom County's impressive existing efforts in this area, we would be a natural leader for this project.

**Resource Savings-** If successful, this measure could reduce the energy requirements of Whatcom County by 64 million kWh per year, concurrently saving approximately \$5 million annually.

**Emissions Reductions-** A 10% reduction in energy use in Whatcom County would result in over 177,000 tons reduction in CO<sub>2</sub> emissions annually.

### **C. LEED Buildings (225 tons CO<sub>2</sub> reduction)**

**Importance/Context-** New buildings constructed to LEED standard can save anywhere from 5% to 40% of the operational energy that would have been required if they were only built to code. Although LEED methods can certainly be more expensive than standard building practices, a recent study comparing 600 facilities built to both LEED and non-LEED standard showed no significant difference in construction cost.<sup>xvi</sup>

**Implementation Scenario** – This measure only includes those residential and commercial structures that are either slated for construction or in the process of being built to LEED standards. Therefore, the municipality is not involved in the implementation of this measure. However, an un-quantified number of additional buildings will be constructed to 'green' standards based on Whatcom County Planning Department's 2006 decision to fast-track permit applications that have registered with LEED or the local Built Green certification.

**Resource Savings-** While every building is different and performs differently, one might assume that these buildings will achieve the average efficiencies seen by other regional LEED buildings documented by the Cascadia Green Building Council. Therefore, the five buildings listed under this measure will combine to save approximately 247,000 kWh per year.

**Emissions Reductions-** Based on the same assumptions, these LEED buildings will reduce the County carbon emissions by 225 tons per year.

## **2. TRANSPORTATION**

### **A. Biodiesel and ethanol sales (150,139 tons CO<sub>2</sub> reduction)**

**Importance/Context** - By 2020, the State of Washington will require that the statewide vehicle fuel mix be at least 10% ethanol in gasoline and 5% biodiesel in diesel. This will reduce our national dependence on foreign oil. In addition, switching to agriculturally-produced fuels stimulates the Washington economy. Finally, biofuels greatly reduce overall carbon emissions because the resulting carbon was absorbed from the atmosphere during the life of the plant and so does not add to the carbon cycle.

**Implementation Scenario** – This measure will likely succeed without direct influence from County government. However, encouraging the use of biofuels by the community of Whatcom County could easily lead to a reduction that is substantially greater than this estimate.

**Emissions Reductions-** Based on estimated growth in demand of gasoline and diesel by the year 2020, a switch to 10% ethanol and 5% biodiesel will avoid 150,000 tons of CO<sub>2</sub> emissions from Whatcom County each year.

**Co-Benefits-** In addition to the benefit of these fuels burning cleaner than traditional gasoline and diesel, their use promotes our energy independence and boosts the local agricultural economy.

## **B. Hybrid vehicle purchases (25,976 tons CO<sub>2</sub> reduction)**

**Importance/Context-** Hybrid vehicles, especially the Toyota Prius and the Honda Insight, can achieve up to double the fuel efficiency of the national average. Driving these vehicles can therefore have a substantial impact on the greenhouse gas emissions generated by a personal or commercial vehicle.

**Implementation Scenario** – According to recent automotive research, hybrid vehicles are expected to comprise at least 5-6% of all passenger vehicle purchases by 2010<sup>xvii</sup>. This is partly due to the increasing cost of motor vehicle fuel and partly due to a large expected increase in hybrid models available. This measure is therefore likely to be successful without stimulus from Whatcom County government. However, public promotion of hybrid vehicles could help the community to surpass this level of engagement.

**Emissions Reductions-** If 5% of all passenger vehicles in Whatcom County are hybrids in the year 2020, it will reduce CO<sub>2</sub> emissions by almost 26,000 tons per year.

**Co-Benefits-** As with all vehicle-related reduction measures, an extensive switch to hybrid vehicles will also lead to reduced emissions of such air pollutants as CO, NO<sub>x</sub>, and volatile organic compounds (VOCs).

## **C. No-idling Policy (8,399 tons CO<sub>2</sub> reduction)**

**Importance/Context-** Studies have shown that people generally leave their vehicles idling for an average of 5 to 10 minutes per day. Idling vehicles waste between ½ and 1 gallon of fuel per hour<sup>xviii</sup>. Therefore, the over 100,000 vehicles in Whatcom County waste approximately 1.5 million gallons of gas per year to idling.

**Implementation Scenario** – Whatcom County government can help to reduce the quantity of fuel wasted in idling by implementing a County-wide “no idling” policy. The reduction total listed here is based on the assumption that such a policy could cut idling time in Whatcom County by 50%. This effort could be coordinated with the Northwest Clean Air Agency.

**Resource Savings-** Not only would this policy save over 750,000 gallons of fuel per year, there would also be a savings on vehicle maintenance because the wear and tear that occurs during idling would be reduced<sup>xix</sup>.

**Emissions Reductions-** This “no idling” policy would prevent the emission of approximately 8,400 tons of CO<sub>2</sub> on an annual basis in Whatcom County.

**Co-Benefits-** In addition to resource and GHG emissions savings, reducing idling will also decrease the emission of nitrous oxides, carbon monoxide, and VOCs that are emitted from vehicle tail pipes.

**Costs** – The cost to Whatcom County would be based on the amount of effort that is put forth for educating the community about the benefits of reduced idling time.

## **D. Success of Bellingham Mode Shift Goal (17,281 tons CO<sub>2</sub> reduction)**

**Importance/Context-** A recent study of Bellingham residents showed that 87% of trips in Bellingham happen in a single occupant vehicle. This travel method uses a tremendous quantity of fuel and emits the largest proportion of CO<sub>2</sub> within the city. The City of Bellingham has therefore adopted a Mode Shift Goal, as part of the Comprehensive Plan, through which it hopes to reduce that number to 75% by the year 2022.

**Implementation Scenario** – In order to reduce single occupant vehicle travel by 12% in the next 16 years, there must be a dramatic increase in pedestrian traffic, bicycling, and transit use. Bellingham and the Whatcom Council of Governments plan to accomplish this through several means, including improved bicycle corridors, road improvements that encourage transit, and incentives to people who choose alternative modes of transportation. Whatcom County can also play an important role in this shift by publicly supporting the City’s efforts, by continuing its support of the Whatcom Smart Trips Program, and by stepping up its effort with County employees to help them use alternative means of travel.

**Emissions Reductions-** If this effort leads to the targeted 12% reduction in vehicle trips, it will reduce community CO<sub>2</sub> emissions by 17,281 tons per year.



**Co-Benefits-** The success of this measure will bring a contingent reduction in air pollution, as with all transportation-related improvements. It will also act to reduce traffic congestion.

### **E. Whatcom Transportation Authority Expansion (484 tons CO<sub>2</sub> reduction)**

**Importance/Context-** Functional and easy-to-use mass transit is one of the simplest ways to move people out of their cars and into a transportation method that is less emissions-intensive. In New York City, it is easier to move by transit than in a car – which is also increasingly true in Seattle at rush hour. Therefore, the vast majority of people choose mass transit over driving a vehicle. Although Whatcom County is much less densely populated than New York City, this success should be a lesson to other communities that transit does not have to be limited to low-income travelers.

**Implementation Scenario** The WTA has recently restructured its transit service, increasing overall bus miles by approximately 20%. WTA expects that in the next year or two, ridership miles will also increase by 20% due to increased service. However, this measure aims to strive for another 10% increase in ridership due to increased usability of the new, more straightforward transit system. This increase is separate from that listed in Section B-4 (Bellingham’s Mode Shift Goal); instead, it prioritizes increased ridership from outside the Bellingham city limits. To achieve this goal, Whatcom County should work with WTA to devise marketing strategies for County residents outside of Bellingham who might find transit a convenient alternative.

**Emissions Reductions-** If WTA can increase its overall miles ridden by the percentages listed above, total County emissions would be reduced by 484 tons eCO<sub>2</sub> per year.

**Co-Benefits-** The success of this measure will bring about the added benefit of reducing congestion in areas adjacent to urban zones.

## **3. WASTE**

### **A. Growth in Community Composting Efforts (13,089 tons CO<sub>2</sub> reduction)**

**Importance/Context-** In 2005, almost 30,000 tons of organic waste was hauled with the rest of our garbage from Whatcom County down to landfills in south-central Washington and Oregon. The FoodPlus Recycling program through Sanitary Service Company is a program already in place that enables organic wastes to stay in Whatcom County and be composted and reused by our community. This measure assumes that by 2020, there will be no organic waste (food scraps, paper, cardboard or yard waste) traveling to the landfill. Although this may seem an ambitious goal, it is more moderate in scope than the Olympia, WA, and San Francisco, CA, goals of *zero* land-filled waste by the end of a similar time frame.

**Implementation Scenario-** The only way that Whatcom County can achieve a complete elimination of organics in the waste stream is to make it mandatory by instituting a County regulation or ordinance. Therefore, it is recommended that Whatcom County work with Sanitary Service Company to increase the capacity of its FoodPlus program to the point that it can accommodate this level of recycling. Once the infrastructure is in place, the County can slowly implement requirements for people to separate their organic waste from other trash.

**Emissions Reductions-** If this measure is successful, community CO<sub>2</sub> emissions can be reduced by over 13,000 tons per year.

**Co-Benefits-** In addition to the environmental benefit of a smaller waste stream, the composted waste will be available as a nutrient additive for local agricultural, nursery, and commercial use. In addition, there will be a reduction in the cost of waste transport because a smaller volume will need to be sent out of Whatcom County.

## 4. OTHER - AGRICULTURE

### A. Three Additional Anaerobic Digesters (34,089 tons CO<sub>2</sub> reduction)

**Importance/Context-** Anaerobic digesters, like the one currently operating in Lynden, generate electricity using methane that is released during cattle waste decomposition. The digesters accomplish several purposes simultaneously, by 1) generating “green” (non-petroleum based) electricity, 2) adding another marketable product to the local agriculture industry, 3) solving the problem of agricultural waste disposal, 4) creating clean compost and fertilizers, and 5) burning methane that would otherwise contribute to climate change.

**Implementation Scenario** – The VanderHaak facility in Lynden has shown that digesters are an economically feasible green electricity option, especially due to research grants that are currently available. Whatcom County can promote the realization of up to three additional digesters by working with Puget Sound Energy, the USDA, and the WSU Climate Friendly Farming Project to create a mutually beneficial project for all involved.

**Emissions Reductions-** If three more digesters of the scale currently in operation can be placed in central Whatcom County, this will reduce community CO<sub>2</sub> emissions by 34,089 tons annually. This number includes only the reduction in methane emissions, not the green electricity component (which is measured at the end-use).

**Costs** – The overall cost for the current digester was \$1.2 million. Of this total, over \$400,000 was paid by USDA grant funding and the WSU Climate Friendly Farming Project. The digester has an overall 8% annual return on investment (ROI) until its financing is paid off. At that time, annual ROI will be close to 22%.

## B. Municipal Measures

As with the community, the Whatcom County government has already slated several emissions reduction measures for implementation over the next few years. The following section details these measures as well as potential additional actions that could be implemented to reach the goal of 25% reduction by 2012.

**Table (10): Proposed Municipal Greenhouse Gas Emissions Reduction Measures**

Measure	Proposed start year	Tons eCO <sub>2</sub> Reduction by 2012	% of Reduction Goal by 2012	Project Contact and Department
<b>Buildings</b>				
<i>HVAC upgrade – Health Dept building</i>	2007 (study)	7	0.11%	Mike Russell and Craig Cummings, Facilities
<i>HVAC upgrade – Civic Center</i>	2008 (study)	7	0.11%	
<i>LEED certification in future building projects</i>	2007	78	1.26%	
<i>Success of County's Conservation Resource Analyst*</i>	2007	95	1.54%	Christina Reeves, Executive's Office
<b>Fleet</b>				
<i>Biodiesel – 5% of Ferry</i>	2009	27	0.44%	K. Richardson, Ferry
<i>Biodiesel 20% of fleet</i>	2007	252	4.08%	Eric Schlehuber, Equipt. Services
<i>Ethanol – 10% of fleet</i>	2008	316	5.11%	
<i>3% reduction in VMT</i>	2007	104	1.68%	All departments
<i>Additional hybrids (10)</i>	2007	21	0.34%	E. Schlehuber
<b>Employee Commute</b>				
<i>Bus Passes – increased transit</i>	2007	110	1.78%	C. Reeves
<i>Education – increased walking and biking</i>	2007	110	1.78%	C. Reeves
<b>Total Proposed Reduction</b>		1064	17.2%	
<b>Total Reduction including current measures</b>		5,457	88.3%	

Source: CACP Model output

\*Note: Although Whatcom County hired a Conservation Resource Analyst in early 2007, the emissions reduction resulting from this position will not occur immediately. Instead, it will happen gradually from 2007 through 2008 and beyond. Therefore, this measure fits appropriately in "proposed measures" section.

### 1. BUILDINGS – UPGRADES AND EFFICIENCIES

All of the following measures will enable the Whatcom County municipal facilities to reduce their energy consumption. However from an eCO<sub>2</sub> standpoint, only those measures which reduce the natural gas usage will lead

to lower greenhouse gas emissions. This is because Whatcom County is now purchasing all of its electricity through green sources. Therefore, emissions from electricity are already reduced to zero. Nonetheless, these measures will increase the energy efficiency of the County's operations and so they remain an essential part of this Action Plan.

#### **A. HVAC upgrade – Health Department Building (7 tons CO<sub>2</sub> reduction)**

**Importance/Context-** Heating and cooling systems are generally the largest energy users in a building. As HVAC systems get older, their efficiency steadily decreases and can reach as low as 40%. Installing a high-efficiency boiler, for example, can bring its efficiency up to 85-95%.

**Implementation Scenario** - The Health Department's HVAC system is extremely old and inefficient. HVAC upgrades can be a fairly expensive investment, but they save up to 35% of the energy required for a building (according to Energy Star). For this measure, a resultant 20% reduction in energy requirement was assumed.

**Resource Savings-** If a high-efficiency HVAC system is installed to replace the current system, overall electric and natural gas requirements for the Health Department building could be reduced by 62,000 kWh per year.

**Emissions Reductions-** If the new HVAC system is installed and has the expected efficiency, it will reduce the electricity and heating requirements for the Health Department building by approximately 20%. The natural gas portion of this savings will reduce the facility's CO<sub>2</sub> output by 7 tons per year.

**Co-Benefits-** Because the current system is inefficient, installing a new system is likely to result in a more comfortable building for both employees and public who use it.

**Costs** - This project is tentatively estimated to cost \$275,000, but it will provide at least \$3,400 per year in energy savings.

**Available Funding-** PSE often provides grants of up to 50% of the cost of building upgrades and retrofits. However, for HVAC systems this is highly dependent on the building itself, especially based on how much of the new system will use electricity versus natural gas (they do not provide funding for the gas portion of systems). Therefore, a more precise estimate would need to come through a site visit by PSE.

#### **B. HVAC upgrade – Civic Center Annex (4 tons CO<sub>2</sub> reduction)**

**Importance/Context-** Heating and cooling systems are generally the largest energy users in a building. As HVAC systems get older, their efficiency steadily decreases and can reach as low as 40%. Installing improvements such as a high-efficiency boiler, for example, can bring efficiency up to 85-95%. Although HVAC upgrades can be a fairly expensive investment, they can also save up to 35% of the energy required for a building (according to Energy Star). For this measure, an expected 20% reduction in energy was assumed.

**Implementation Scenario** The Civic Center Annex facility is currently in a state of flux. If a decision is made that the County intends to keep the building, the Facilities Department should talk with PSE about grant funding availability. They can then obtain more exact cost estimates and the County can move forward with plans to complete the upgrade.

**Resource Savings-** If this upgrade saves 20% of the energy required for this facility, the resultant savings will be approximately \$6,081 per year between electricity and natural gas.

**Emissions Reductions-** By upgrading the HVAC system in the Civic Center, the emission of 4 tons natural gas-related CO<sub>2</sub> can be prevented annually.

**Co-Benefits-** The current system is highly inefficient and frequently leaves employees either hot or cold. When the building gets hot, employees turn on several fans around the building, thereby increasing the electrical load. A more efficient system would keep employees more comfortable and reduce this secondary electrical load.

**Costs** - Although this project has not yet been bid, there is currently \$300,000 budgeted for engineering and analysis of the best way to proceed with this measure.

**Available Funding**- PSE often provides grants of up to 50% of the cost of building upgrades and retrofits. However, for HVAC systems this is highly dependent on the building itself, especially based on how much of its HVAC system will be using electricity versus natural gas (they do not provide funding for the gas portion of systems). Therefore, a more precise estimate would need to come through a site visit by PSE.

### **C. LEED Certification in Future Building Projects (78 tons CO<sub>2</sub> reduction)**

Building a facility to LEED standard can save anywhere between 10% and 40% of its energy requirements. In addition, new studies of LEED-certified facilities are showing that building to LEED standard is generally within 1% of the cost of standard building practices<sup>xx</sup>.

**Implementation Scenario** – In 2005, Whatcom County Council resolved to build and renovate any additional County buildings to LEED Silver standard whenever feasible. With this in mind, the County should look to inexpensive LEED options that will save over the long term when considering any new construction or renovation projects. These options have already been sought in the County Courthouse over the past several years, and this has allowed the County to pursue LEED-Existing Buildings certification for that building.

**Resource Savings**- Based on the forecasted 19% growth in County operations between the base year and target year, a concurrent growth is expected in County energy requirements. Therefore building to LEED standard on all facilities used to accommodate this growth, whether new or renovated, should provide an opportunity to reduce this additional energy requirement by 864,000 kWh (496,000 kWh electricity and 12,555 therms natural gas) by 2012.

**Emissions Reductions**- A reduction of 12,555 therms of natural gas will reduce the municipality's CO<sub>2</sub> emissions by 78 tons per year.

**Co-Benefits**- Because there remain a limited number of LEED-certified buildings in Whatcom County, the municipality could easily become a leader and a model for efficient, green building practices in the community.

**Costs** – If implemented intelligently, studies show that LEED standards can be met at a cost within 1% of standard (to-code) building practices.

### **D. Success of Conservation Resource Analyst (95 tons CO<sub>2</sub> reduction)**

In January 2007, Whatcom County hired a full-time Conservation Resource Analyst to work on energy efficiency and climate protection issues. Although this position has already been filled, the full emissions reduction potential has not yet been realized which therefore places it in the Proposed Measures category.

This position is partially funded by Puget Sound Energy for the first year, and is expected to pay for itself in energy savings within three years. The initial focus of the position has been employee education, specifically with respect to turning off lights and equipment when they are not needed. Additional focus is placed on building energy management systems, so they operate as efficiently as possible. The CRA is also charged with finding energy-saving and cost-effective upgrade options for equipment used in County facilities. Finally, this position audits other aspects of County operations in search of innovative ways to reduce emissions from things like vehicle travel and employee waste generation.

**Resource Savings** - This position can be expected to enable a 5-10% reduction in the County's utility bills over the long term.

**Emissions Reductions**- The addition of a CRA to County staff is expected to enable a 95-ton reduction in annual eCO<sub>2</sub> output by municipal operations.

**Co-Benefits**- This position will more than pay for itself in savings over time. In addition, the CRA will work to increase the energy-consciousness of County employees so that opportunities to conserve energy may become more readily apparent in their homes as well.

**Costs** – The funding for a CRA costs the County approximately \$50-60,000 per year, when all wages and benefits are added together.

**Available Funding-** Puget Sound Energy is currently funding about 13% of the first year’s salary for this position. Moreover, PSE also offers a guarantee that the position will pay for itself over a three year period; if savings does not more than cover the cost of the position, then PSE will pay Whatcom County the difference.

<b>Cost to County</b>	
<i>Capital</i>	0
<i>Ongoing</i>	\$50-60,000/year
<i>Payback Period</i>	2-3 years

**E. Additional on-demand water heater at Lighthouse Park (Savings only in electricity, no emissions reduction)**

On-demand water heaters have already been installed in 4 locations in Parks facilities. These heaters utilize electric heating coils that are only used when the water is running, thereby avoiding the need for a tank-style water heater that runs regardless of whether anyone is using it.

**Implementation Scenario** – One of the three restrooms at Lighthouse Park already contains an on-demand water heater. The tank-style heater that serves the other two restrooms is due for replacement in the near future. Instead of purchasing a large, commercial tank heater, the County could purchase an on-demand unit.

**Resource Savings-** An on-demand water heater should save \$250 per year in energy costs.

**Costs** – These units cost between \$400 and \$1,000 per unit. Because this one will need to service two restrooms, the projected cost is \$1,000.

<b>Cost to County</b>	
<i>Capital</i>	\$1,000
<i>Ongoing</i>	0
<i>Payback Period</i>	4 years
<i>Annual Savings</i>	\$250/yr

**2. BUILDINGS – LIGHTING UPGRADES**

According to the Energy Star web site, lighting in an office building uses 25-30% of the energy requirements for that facility. Lighting retrofits can reduce those energy requirements by up to 50%. Although these retrofits will not technically reduce eCO<sub>2</sub> emissions because they are all electricity-related (electric emissions are already zero due to Green Power Purchase), they save a substantial amount of money each year in utility bills. In addition, Puget Sound Electric provides grant funding for up to 50% of retrofits, which creates a payback period of only about three years.

**A. Light Retrofit – Civic Center Annex**

This building is scheduled for a lighting retrofit during the 2008 budget season.

**Implementation Scenario** – This is the only proposed lighting upgrade for which there has not been a PSE estimate completed for replacement costs and benefits. The County must first obtain a bid for the project, and then the following assumptions can be verified.

**Resource Savings-** Based on the other lighting bids for County facilities, upgrading the Civic Center Annex will save approximately 56,000 kWh per year (about \$4,266).

**Costs** – Although the bid has not yet been completed, Whatcom County Facilities estimates that this upgrade will cost approximately \$65,000.

**Available Funding-** A PSE retrofit grant will likely be available to cover 50% of this project. However, the current available grant structure will be up for renegotiation for 2008. Therefore to ensure this funding, the County should move to complete this project as soon as is feasible.

<b>Cost to County</b>	
<i>Capital</i>	\$32,500
<i>Ongoing</i>	0
<i>Payback Period</i>	7.6 years
<i>Annual Savings</i>	\$4,266

**B. Light Retrofit – Bellingham Senior Center**

A lighting retrofit for the Bellingham Senior Center was calculated by PSE in 2005 but did not receive budget funding until 2007.

**Implementation Scenario** – The bid that was completed in 2005 must be re-approved by PSE, at which time the estimates can be updated to current dollar figures. The County can then move forward to complete the lighting retrofit in late 2007 or early 2008.

**Resource Savings-** This project is projected to save approximately 19,000 kWh per year, equivalent to \$1,443 in savings.

**Costs** - As of summer 2005, this retrofit was bid at \$12,444.

**Available Funding-** There is a 50% PSE grant available for this project. However, the current available grant structure will be up for renegotiation for 2008. Therefore to ensure this funding, the County should move to complete this project as soon as is feasible.

<b>Cost to County</b>	
<i>Capital</i>	\$6,222
<i>Ongoing</i>	0
<i>Payback Period</i>	4.3 years
<i>Annual Savings</i>	\$1,443

**C. Light Retrofit – Plantation Rifle Range**

The grant funding available from PSE for this project was calculated in 2005, and the project is expected to take place in late 2007 or early 2008.

**Implementation Scenario** – The PSE grant funding for this project will have to be re-calculated to reflect 2007 costs. Then the project will need to go through the County’s regular bidding process and move to completion by early 2008.

**Resource Savings-** This project is expected to save 12,026 kWh per year, equal to \$1,241.

**Costs** – The expected cost for this retrofit is approximately \$6,000.

**Available Funding-** There is a PSE grant available for up to 50% of the project’s costs. However, the current available grant structure will be up for renegotiation for 2008. Therefore to ensure this funding, the County should move to complete this project as soon as is feasible.

<b>Cost to County</b>	
<i>Capital</i>	\$2,929
<i>Ongoing</i>	0
<i>Payback Period</i>	3.2 years

<i>Annual Savings</i>	\$1,241
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### 3. STREETLIGHTS AND SIGNALS

Upgrading street lighting and signals is an often-overlooked measure that is extremely cost-effective. Switching from regular bulbs to Light Emitting Diodes (LEDs) reduces the energy requirements of these lights by up to 85%. In addition, LEDs last 8-10 times longer than standard signal lighting, which saves a great deal on maintenance as well. Savings listed below do not include expected maintenance reductions; they are only based on electricity usage.

As with the electricity-related building improvements, these upgrades will not reduce the CO<sub>2</sub> output of County operations because the Green Power purchase has brought electricity-related emissions to zero. However, the substantial savings that are possible over time makes these measures excellent candidates for improving the energy efficiency of County operations.

#### A. **Convert all flashing traffic signals to LED**

**Implementation Scenario** – In the fall of 2006, an audit was completed of County-owned lights and signals. This audit was completed to ensure that the County is only using, and therefore only upgrading, those signals which are still needed and which exist over roads that are still owned by Whatcom County. The details of this measure are based on the results of that audit.

**Resource Savings**- This measure should save \$800 per year in reduced electricity usage. As noted above, there will also be a significant but difficult to quantify reduction in maintenance costs.

**Costs** –Yellow LEDs cost approximately \$120 apiece, while red LEDs cost about \$75 each. There are approximately 16 intersections in Whatcom County with flashers that are maintained by the County. Most of these intersections utilize four-way, red flashing lights. Based on the number of each type of light, this upgrade will cost \$4,020.

**Available Funding**- PSE offers rebates of \$10/light for red signals, but not for yellow signals.

<b><i>Cost to County</i></b>	
<i>Capital</i>	Approximately \$4,020
<i>Ongoing</i>	0
<i>Available funding</i>	\$410
<i>Payback Period</i>	~ 5 years, not including reduced maintenance
<i>Annual Savings</i>	\$800/yr

#### B. **Convert all stop signals to LED**

**Implementation Scenario** – As with the flashing amber lights, an audit of County lights has been completed prior to moving forward on this measure, to ensure that the upgrade includes all signals owned by Whatcom County. Since the City of Bellingham maintains County stop-lights, they will be upgrading these lights in fall 2007 as part of regular maintenance activities.

**Resource Savings**- If the current rough estimates are correct, this measure will save \$3,682 per year on utility bills. In addition, maintenance costs for the lights will be drastically reduced.

**Costs** - Red LED lights costs approximately \$75 apiece, and yellow or green LED lights cost about \$120 each. The current estimate is that the County owns 4 four-way street lights (each having four of each color). Therefore, total cost for the project should be about \$5,040.

**Available Funding**- PSE provides funding for lighting upgrades in the amount of \$10 per red light, \$20 per green light, and \$5 per yellow when it is in the same light as the other colors. Based on the above estimates, there should be a PSE rebate of approximately \$560.



<b>Cost to County</b>	
<i>Capital</i>	\$5,040
<i>Ongoing</i>	0
<i>Available Funding</i>	\$560
<i>Payback Period</i>	1.2 years.
<i>Annual Savings</i>	\$3,682

#### **4. FLEET VEHICLES**

##### **A. Switch to 20% biodiesel in all diesel vehicles except Ferry (252 tons CO<sub>2</sub> reduction)**

**Importance/Context-** Transportation factors make up over 38% of the County’s greenhouse gas emissions. Therefore, reducing the carbon output of the municipal fleet will be a necessary step toward reaching the reduction target. Switching to agriculturally-based fuels helps to reduce this output.

While biofuels emit CO<sub>2</sub> when burned, the original source of the carbon is relevant. The carbon released from biofuels originally comes from plants that absorbed it from the atmosphere as they grew. If these plants were not used as fuel, they would decompose and the CO<sub>2</sub> would be emitted nonetheless. Biodiesel and ethanol emissions are therefore part of the natural carbon cycle, whereas petrochemical emissions release carbon that was previously sequestered underground and is being added to the cycle.

**Resource Savings-** At current prices, biodiesel mixes are slightly more expensive than straight diesel. However, diesel prices are currently very volatile, making it difficult to accurately estimate costs versus savings.

**Emissions Reductions-** If this switch to 20% biodiesel is put into effect, the result would be a 252-ton reduction in annual CO<sub>2</sub> emissions in Whatcom County.

**Costs** – As long as biodiesel remains less expensive than standard diesel fuel, the only costs for this measure would be employee time to research warranty issues and then to secure a supplier at the B-20 level. It is likely that these vendors will be the same as those used to implement the B-5 level of biodiesel use, which would make the cost of implementation minimal.

##### **B. Switch to 10% ethanol in all fleet vehicles using gasoline (316 tons CO<sub>2</sub> reduction)**

**Importance/Context-** Transportation factors make up over 38% of the County’s greenhouse gas emissions. Therefore, reducing the carbon output of the municipal fleet will be a necessary step toward reaching the reduction target. Switching to agriculturally-based fuels helps to reduce this output. While biofuels emit CO<sub>2</sub> when burned, the original source of the carbon is relevant. The carbon release from biofuels originally comes from plants that absorbed it from the atmosphere as they grew. If these plants were not used as fuel, they would decompose and the CO<sub>2</sub> would be emitted nonetheless. Biodiesel and ethanol emissions are therefore part of the natural carbon cycle, whereas petrochemical emissions release carbon that was previously sequestered underground and is being added to the cycle.

**Implementation Scenario** – Over the next several years, ethanol will be required as 10% of all gasoline sold in Washington State. Therefore, achieving this transition early will place Whatcom County in a leadership role that paves the way for a smooth transition elsewhere. Currently, the only known public fueling station dispensing a high proportion of ethanol is the Connell Oil Pacific Pride station in Richland. In order for Whatcom County to begin using an in-house mix fuel containing ethanol, contact should be established with this company to arrange either delivery or a direct supply from its distributor.

For out-of-house fueling, all ARCO stations in Whatcom County already use a fuel mix with 10% ethanol. Therefore, the County should consider either filling at these stations or making contact with our current fuel supplier (Reisner) to request that ethanol be added to its own mix.

**Emissions Reductions-** This measure will enable one of the largest reductions in CO<sub>2</sub> emissions for Whatcom County government. Transitioning to 10% ethanol in all gasoline-powered fleet vehicles will lead to an annual 316-ton reduction in carbon emissions. It should be noted, however, that ethanol production is currently in a state of transition. Therefore, this level of reduction will only be achieved after corn-based ethanol (a highly energy-intensive product) has been replaced by a product made from switchgrass or other “cellulosic” feedstocks.

**Co-Benefits-** As with biodiesel, using ethanol in the fleet fuel mix will help to promote local agriculture and reduce our dependence on foreign oil.

**Costs** – Ethanol is 10% less efficient than gasoline, making a 10% ethanol/gasoline mix approximately 1% less efficient overall. In 2005, Whatcom County fleet vehicles used a total of 211,078 gallons of gasoline. At 1% less efficient, the cost for this switch would be about \$6,500 per year.

**C. Switch to 5% biodiesel Lummi Island Ferry (27 tons CO<sub>2</sub> reduction)**

**Importance/Context-** The Lummi Island Ferry is the largest single user of fuel in Whatcom County’s vehicle fleet. Therefore, adding biodiesel to the Ferry’s fuel mix is the fastest way to increase the overall biodiesel component of the County fleet.

**Implementation Scenario** – The Washington State Ferries (WSF) system ran a biodiesel pilot in 2004, which ended early due to problems with precipitation of biofuel components. The Washington State Ferry system is currently performing laboratory tests to determine the exact nature of the problems and to find solutions that will allow biodiesel to be used in cold-water marine situations. Implementation of this measure will require research and close contact with Paul Brodeur of WSF to ensure that the Lummi Ferry does not have the same problems.

**Resource Savings-** As mentioned above, pure biodiesel is slightly more expensive than regular diesel. However, overall costs or savings are difficult to estimate due to fluctuating fuel prices.

**Emissions Reductions-** Switching to 5% biodiesel in the Ferry would reduce CO<sub>2</sub> emissions by 27 tons per year. In the future, increasing this proportion to 20% biodiesel would reduce County CO<sub>2</sub> emissions by an additional 108 tons annually.

**Costs** – A feasibility study will be necessary to determine whether any retrofits of the existing ferry engine will be necessary in order to successfully transition to using biodiesel.

**D. Promote an overall 3% reduction in fleet vehicle travel (104 tons CO<sub>2</sub> reduction)**

**Importance/Context-** In order to substantially reduce the County vehicle fleet’s greenhouse gas emissions, the above measures must be implemented in conjunction with an effort to reduce the total number of fleet miles traveled. This can be accomplished through an attempt to educate employees about reducing the number of trips they take and to carpool whenever possible.

One possible scenario for implementing this measure would include maintenance of a log book that provides closer monitoring of vehicle use in each department. Oversight of this process could be another duty of the Conservation Resource Analyst.

**Resource Savings-** Reducing fleet vehicle usage by 3% would save over \$30,000/yr in fuel costs alone, not including the associated reduction in maintenance costs.

**Emissions Reductions-** This measure would reduce the fleet CO<sub>2</sub> emissions by 104 tons per year.

**Costs** – The only costs for this measure would be staff time and the resources required for an educational campaign to reduce overall miles traveled in County vehicles.

<b><i>Cost to County</i></b>	
<i>Capital</i>	\$5,000 in employee wages and educational tools
<i>Ongoing</i>	\$1,000/year ongoing educational effort
<i>Annual Savings</i>	\$30,000/yr at current fuel prices

## 5. EMPLOYEE COMMUTE

Employee commuting comprised 18% of all municipal CO<sub>2</sub> emissions in the year 2000. In 2005, that number had actually grown by 0.5% as a result of both an increase in FTEs and a longer commute distance per employee. Therefore, efforts to reduce single occupant vehicle trips by County employees will be an important step toward reducing the greenhouse gas emissions of the Whatcom County government. The most effective ways to reduce these trips are through: 1) transit use, 2) walking and biking, and 3) carpooling.

### **A. Reduce employee vehicle miles traveled (VMT) by 5% through increased transit use (110 tons CO<sub>2</sub> reduction)**

**Implementation Scenario** – This measure will be most successful if employees have some incentive for using public transit. Therefore, it is recommended that the County look into the purchase of annual bus passes (currently \$200) for employees who sign up for them. One option would be to provide these passes for free to those employees willing to give up their County parking spaces. This would then provide the concurrent benefit of easing the present need for additional employee parking.

The additional cost to provide these passes could be partially offset by an increase in monthly parking rates in the County's downtown lots, which are currently available at below-market prices.

The assumption of a 5% emissions reduction is based on a goal of 10% sign-up for the program and that those who sign up will take the bus half of the time.

**Emissions Reductions**- If this measure led to a 5% reduction in total vehicle-miles traveled (VMT) by commuting employees, the County's CO<sub>2</sub> emissions would be reduced by 110 tons per year.

**Co-Benefits**- This program, if successful, could become an educational platform for the community. It will help show that public transit is a viable transportation method for employees of downtown businesses. In addition, it will both improve the economic success of the WTA and reduce the growing traffic congestion in the Bellingham area.

**Costs** – There will be a small cost in employee time for an educational effort to promote the program among the County staff. This effort could be a joint project between the Conservation Resource Analyst and the Commute Trip Reduction coordinators. If 10% of employees sign up for the program, at current prices it will cost Whatcom County an additional \$18,000 per year for the bus passes.

<i>Cost to County</i>	
<i>Capital</i>	\$1,000 for an educational campaign
<i>Ongoing</i>	\$18,000 per year

### **B. Reduce 5% of employee VMT through increased walking, biking, and carpooling to work (110 tons CO<sub>2</sub> reduction)**

**Implementation Scenario** – The biking and walking portion of this measure should be geared toward County employees that live 5 miles from their workplace or closer, while carpooling is most effective for longer-distance commuters. The success of this measure will depend upon a strong educational program to promote employee buy-in to these forms of transportation.

One scenario to make this program effective would be to implement a tracking system by which employees tally each time they either walk, bicycle, or carpool to work, using the Whatcom Smart Trips web site. Each quarter, the department with the most per-capita reduction in vehicle miles could receive a free luncheon or other reward as available from the County.

**Emissions Reductions**- If this measure successfully generates a 5% reduction in vehicle-miles traveled by commuting employees, the County's CO<sub>2</sub> emissions will be reduced by 110 tons per year.

**Co-Benefits**- This measure's success can be used as an example to the community of how to reduce vehicle miles traveled. It may also cause employees to think more about the way that they travel to locations outside their workplace.

Any resultant changes in vehicle traffic due to these factors will bring both environmental benefits and reduced traffic congestion in high-density areas.

**Costs** - Initially there will be some cost for an educational effort to promote the program among employees. This could be a joint effort between the Conservation Resource Analyst and the Commute Trip Reduction coordinators.

## **VII. Conclusion**

Climate change is an issue of growing concern for communities across the United States and around the world. Whatcom County has displayed great leadership and foresight in choosing to confront this issue now. By reducing the amount of greenhouse gases emitted by its community, Whatcom County joins hundreds of other American cities in stemming the tide of climate change and its numerous associated threats, such as increased droughts and flooding, disrupted agricultural systems and rising sea levels.

In addition to mitigating the destabilization of the climate and associated effects, Whatcom County stands to benefit in many other ways from the proposed measures outlined in this report. First, many of the actions recommended here are financially sound decisions regardless of their relationship to climate change issues. To a large degree, implementing this Action Plan will create a more vibrant community, because people will feel the benefits of a cleaner environment and a reduction in the traffic congestion that is beginning to affect this area. In the County government, this Plan will create a workforce that is more conscious of the way it uses resources, and employees and the community alike will be reassured by the fact that the Whatcom County government is doing its part to reduce the local factors that contribute to climate change.

Meeting Whatcom County's reduction target will require both persistence and adaptability. Therefore the most critical part of this plan is to continue funding the County's new Conservation Resource Analyst position, to ensure that the existing forward momentum is maintained and enhanced. This person can promote measures already in progress and being implementation of those that have yet to begin. With the continued support of the County Council, the Executive's Office, and the County staff as a whole, these targets will be readily achievable. The path to reduced emissions is clear, and Whatcom County now needs to take the steps necessary to lead this community in the right direction.

## **VIII. Guide for Future Steps**

### *A. Administration and Staffing*

A key part of effectively implementing this plan is the assignment and definition of management responsibilities for the individual components. Fortunately, the County has already set aside funding for this in the form of a Conservation Resource Analyst for at least 2007 and 2008.

In addition, it may make sense for the County Executive and Council to establish a Climate and Energy 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 Conservation Resource Analyst. The goals of this committee would be threefold: to educate the community about energy efficiency and renewable energy incentives and programs, to comment on current and proposed County actions, and to recommend and coordinate actions in the private sector.

This Action Plan is an opportunity to renew and reinforce Whatcom County's commitment to existing programs and projects that have the effect of reducing GHG emissions. By identifying them as key elements in the Local 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 adding more buses or routes to expand transit use, may require significant up-front investment, whereas some, such as setting all computers on energy efficient sleep mode, will require no added expenditure.

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 this Action Plan's programs and measures should be timely enough to get Whatcom County to its goal by the target year. However, expectations 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 for realizing the greenhouse gas reduction goal and provide ample time for external review and input. It should also set aside time for citizen involvement and input as well as 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, develop the best possible recommendations, generate the strongest possible support, and integrate 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. A Climate and Energy Committee, convened by the County Council, should contain representatives from the whole spectrum of the community. 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 this 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. Monitor to check if the figures change in the ways predicted. If not, resolve whether this is a result of inadequate program implementation, or if the measures adopted were not sufficient. Tracking and measuring should be routine, so as to remain aware of the progress Whatcom County is making.

One of the ways in which the Action Plan can become incorporated into the larger municipal and community operations is by including the proposed recommendations in county-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 the Jurisdiction 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 - Data Collection Process, Assumptions and Notes**

### ***Community Inventory***

*Electric, Natural Gas and Propane:* Overall community electricity and natural gas usage data were gathered through a request to Puget Sound Energy and Cascade Natural Gas, performed by Alex Ramel of ICLEI. PSE was able to provide a total number of kWhs used in the County, divided into Residential, Commercial, and Industrial sectors. These data included all electricity users except those served by Whatcom PUD #1, the Cities of Blaine and Sumas, and Alcoa Intalco Works of Ferndale. Usage through PUD, Blaine, and Sumas was determined through a request to those organizations; the Alcoa numbers were unable to be gathered for this report.

For Cascade Natural Gas, data were only available as far back as 2003. Usage for 2001 was therefore estimated based on the projected relationship between therm usage and heating degree days. In addition, there are several large users of natural gas in Whatcom County who do not purchase their fuel through CNGC. For most of these, throughput data were available from Gail King at the Northwest Clean Air Agency. However, there are at least three for whom this information was not available.

There were five private vendors for community propane use: Northwest Propane, 1<sup>st</sup> Propane, Propane Gas Inc, Vanderyacht Propane, and the Whatcom Farmers' Co-op. These vendors were contacted by either Evan Malczyk of ICLEI or Christina Reeves and all but one provided estimates of their usage from 2000-2005. The fifth was unable to provide the requested information, and so its usage was estimated with the help of another vendor.

*Transportation data:* The County-wide vehicle mileage data were taken from the Highway Performance Monitoring System (HPMS) annual survey. The total miles traveled were entered into the CACP software, which generated an estimate of emissions based on national mpg averages.

*Waste:* The numbers for total waste in Whatcom County were taken from the annual Washington Department of Ecology Solid Waste Division database, available online at: <http://www.ecy.wa.gov/programs/swfa/solidwastedata/>. The breakdown of waste components was assumed to be the same as what is listed in the Whatcom County Recycling Potential Assessment. To determine the methane recovery factors for each landfill, the facilities were contacted directly. Because CACP software only allows for one value for methane recovery, a weighted average of these numbers was generated based on how much waste went to each land fill.

Finally, emissions from waste transport were calculated by Evan Malczyk of ICLEI. He contacted the waste haulers to determine how much waste traveled by train versus truck, then calculated the distance to each land fill. He used the average fuel economy for commercial trucks and found efficiency data for trains on the Burlington Northern Santa Fe web site. He then calculated gallons of fuel used, per tons of waste, per mile of travel, to generate an additional emission coefficient for Whatcom County waste hauling. Whatcom County was able to use these coefficients to calculate the additional emissions generated by the transport of our waste.

*Other/Agriculture:* The data for methane emissions from cattle farming were largely provided from WSU Extension, either through contact with Craig MacConnell or Chad Kruger. They provided census information for the number of cows in Whatcom County during the years 1997 and 2002, as well as the estimated annual methane emissions per cow. A cattle population for 2001 and 2005 was then estimated and the resultant total methane emissions were able to be plugged directly into the CACP software.

### ***Municipal Inventory***

*Electricity, Natural Gas, and Propane:* As with the Community inventory, data for electricity and natural gas were generated through a request from PSE and Cascade Natural Gas. To do this, a list of all account numbers for each vendor was requested from Kristin Frank in the County Finance department. Alex Ramel of ICLEI then sent an information request to both vendors for all usage data for 2000 and 2005. PSE was able to forward monthly usage data beginning between January and June of 2000. For this report, the 12-month period starting whenever the data were first available was used as the estimate for 2000 electricity use.

The same methods were used to determine electricity usage by the street lights and signals that are owned by the County.



As with the Community data, for natural gas the usage information was only available back to 2003. Therefore, a comparison was made of heating-degree days from 2000 and 2003, and this was used to generate an estimate of therm usage per facility in 2000. The problem with this method is that it does not incorporate efficiency measures enacted between 2000 and 2003. Fortunately, most heating-related efficiencies happened in 2003 or later.

For propane usage, there was no straightforward way to research County bills from 2000 and 2005. Instead, a report was generated through the Finance department that listed all the money paid to the local propane vendors during those years. Average propane prices were gleaned from Energy Information Administration (EIA) West Coast reports for the two years, which allowed an estimation of the total gallons used.

Vehicle Fleet data: To determine the fleet vehicle usage by department, Eric Schlehuber was able to provide records for in-house fueling in 2000 and 2005. Reisner, whom the County uses for most other fueling, was also able to provide per-vehicle data on fuel usage in 2005 but not 2000. For 2005, data from both locations were compiled by department and entered as total gallons used into the CACP software.

For 2000 out-of-house data, Finance provided a total dollar amount paid to the fueling company. This was used in conjunction with 2000 average fuel prices and 2005 departmental usage breakdowns to estimate the gallons used per department for out-of-house fuel.

For the Lummi Ferry, exact usage was available for 2005 but not 2000. However, all fuel for the Ferry came from one vendor in 2000, so total cost and average fuel prices were again used to estimate the gallons consumed by the Ferry in that year.

Employee Commute – Most data regarding employee commute were available through Suzanne Mildner, the Commute Trip Reduction coordinator for the Courthouse. She was able to provide CTR surveys from 1999 and 2005 for both the Courthouse and the Northwest Annex, which together represent the vast majority of County employees. These surveys provided data on the number of employees per worksite and the daily average vehicle miles traveled (VMT) per employee.

An assumption was made that the 1999 data would have been the same for 2000.

The average daily VMT for all County employees was derived using these data in conjunction with the employee census data taken from the County budget summary for 2000 and 2005. A weighted average was taken of the per-employee VMT for the Courthouse and Northwest Annex, and this number used to represent average VMT for the employees not counted in the two surveys.

Solid Waste Emissions: The total waste generated by County employees was difficult to measure, because Sanitary Service Company does not weigh individual trash bins as they are collected. However, at the Courthouse and Jail a 30-yard dumpster is used, and then hauled to the transfer station where it is weighed. Therefore, a precise per-employee waste generation average was able to be calculated at those locations. Based on those numbers, 0.25 tons of waste is generated per employee per year (0.37 ton/employee including recyclables). This is very similar to the data generated from the 1999 California Statewide Waste Composition Study, which found that employees of municipal facilities generate an average of 0.356 tons/employee/year including recyclables.

The methane recovery factor used for municipal waste was the same as that for community waste.

### ***Forecasting***

All forecasting was based on the results of the ECONorthwest study that is cited in the Whatcom County Comprehensive Plan. This study estimates the medium average annual growth rate for this area to be 1.5% between 2002 and 2022. Because County services are expected to grow in proportion to the population of the Community, the business-as-usual forecast for municipal emissions was a straight 1.5% growth per year in all aspects of County emissions. Therefore, emissions from electricity, natural gas, gasoline, diesel, propane, and waste are forecast to grow by 19.56% between 2000 and 2012.

For the Community forecast, a more precise estimate was used with the help of Alex Ramel of ICLEI. He used regional growth forecasts for different energy sources by sector that were provided by the Energy Information Administration. These data were then tailored to the expected growth rates for Whatcom County. Therefore,

instead of an annual growth of 1.5% in all sectors, individual energy types (electricity, natural gas, propane, gasoline, and diesel) had growth rates ranging from 0.99% (commercial natural gas use) per year to 12.02% (industrial propane use) annually.

### ***Community Measures***

Energy Efficiency: For current measures at Post Point, data were used that had been collected by Alex Ramel of ICLEI, who is performing the Bellingham inventory. He was told by Larry Bateman, Plant Manager, that improvements in management techniques since 2001 had allowed its energy use to remain constant while its inflows were growing by 1% per year. Based on actual energy usage during those periods, Alex Ramel was able to calculate the savings.

The Bellingham Federal Building was listed as Energy Star in 2000. Based on information from the Energy Star web site, savings from upgrades leading to this listing save \$45,000 per year. I used an average current electricity cost of \$0.076/kWh to determine the kWh reduction.

Future measures in energy efficiency are based on the national Energy Star Challenge goal of a 10% efficiency improvement through this type of measure. The reduction from this measure was based on a 10% reduction in both electricity and natural gas usage in the community.

Green Power Purchases - Current levels of Green Power program participation were provided by PSE. These were listed monthly and showed a huge increase in October of 2005, which was when Western Washington University starting purchasing green power. Therefore, the annual usage was estimated without that increase in order to show community green power separately from the published data for WWU energy use.

Alex Ramel provided the data for kWh of green power that the City of Bellingham will be purchasing since it passed the 100% green power resolution in August.

For future green power purchases and overall increases in green power, it is assumed that by 2020 at least 20% of residential, 15% of commercial, and 10% of industrial electricity would be coming from green power sources. This was not specifically broken down into that which would automatically come from the power provider versus that which would be purchased specifically in the form of Green Tags.

### ***Transportation measures***

Hybrids - The current number of hybrid vehicles registered in Whatcom County was provided by Judy Abern of the Department of Licensing. She also provided the breakdown by type of vehicle, which enabled an online search to find average fuel efficiencies of each model. A weighted average of fuel efficiency was calculated for each model, resulting in an average efficiency of 52.7 mpg. This was then compared against the average mileage of similar non-hybrid vehicles that they likely replaced. The total emissions reduction was based on the difference between these mileages multiplied by the national average of 15,000 miles driven per vehicle per year.

For future hybrid purchases, best available data suggest that hybrids will be at least 5-6% of all vehicles purchased by 2010 (see <http://www.hybridcars.com/sales-numbers.html>). The calculation for total emissions reduction was based on the current national average passenger-car mileage (22.8 mpg) and an average of 15,000 miles driven per year.

Biodiesel and ethanol - For biodiesel purchase in the community, data was used that Alex Ramel had collected for purchases inside the City of Bellingham. This was combined with data from the one biodiesel vendor in Whatcom County that is located outside of Bellingham. All vendors supplied sales information, which together provided a total for all diesel fuel that has been replaced by biodiesel.

For future biodiesel and ethanol use, the assumption was made that by 2020 the full level of State standard would be in effect: biodiesel will comprise at least 5% of overall diesel used in the County, and ethanol will comprise 10% of overall gasoline.

Bellingham Mode Shift - The estimated reduction from the Bellingham Mode Shift Goal was taken directly from estimates made by Alex Ramel in Bellingham.

*No-idling* - The no-idling policy information was based on estimates from the EPA's school bus anti-idling program, which can be researched online at: <http://epa.gov/cleanschoolbus/antiidling.htm>. This site provides data regarding how long vehicles idle on average as well as how much fuel is wasted per hour of idling. These data were used, in conjunction with the total number of registered vehicles in Whatcom County (from DOL), to determine the total gallons of gas wasted annually to idling. The 50% reduction through a no-idling policy was a ballpark estimate.

*WTA expansion* - The WTA expansion data came from a conversation with Rick Nicholson of WTA. He provided ridership data, total route distances, average bus speed, plus he explained the changes in all those numbers due to the recent upgrades as well as the expected continued growth that has not yet been realized. Reduction estimates were determined based on these numbers, and the assumption was made that another 10% increase in ridership would be possible with additional education about alternative transportation for Whatcom County residents.

*Waste Management* – The numbers for waste reduction were based on the introduction of the FoodPlus recycling program through Sanitary Service Company since 2004. Ed Nikula of SSC provided data for the amount of waste that has been diverted to composting annually since the program started.

For the proposed composting measure, emissions reduction was based on the breakdown of County waste that was estimated in the Whatcom County Recycling Potential Assessment. The emissions reduction is based on the idea that by 2020 there would be zero organic waste going to the landfill (this would probably require some kind of enforced ban on organics in the trash). Although this may seem like an ambitious goal, there should be substantial leeway for this measure because 2005 waste generation numbers were used. Therefore, growth in overall waste will allow for a small percentage of organics to remain in the waste stream.

*Other/Agriculture* – Information about the VanderHaak anaerobic digester was compiled with the help of Craig MacConnell of WSU Extension as well as from the digester's fact sheet and press release, available online at:

<http://cff.wsu.edu/Publications/AD%20Vander%20Haak%20factsheet%207%2013%2006.pdf#search=%22vanDerHaak%20digester%22>.

The proposed measure for installing three more digesters in Whatcom County is based on the assumption that they would have the same specifications at the VanderHaak unit.

### ***Municipal Measures***

*Building improvements*: Almost all information for current buildings measures was gathered with the help of Craig Cummings and Michael Russell in Facilities, and Michael Chiavario and Lynne Givler of Parks.

Because there have been so many upgrades to the Courthouse and Jail, savings from individual measures were not estimated. However, the total energy use reduction was calculated based on the difference in kWh and therm usage between 2000 and 2005.

Energy savings due to installation of high-efficiency furnaces was based on the Energy Star website's estimate that 10-30% of overall energy can be saved through heating improvements. 10% was used because at least two of the buildings had these heaters installed for only a portion of the building.

On-demand hot water estimates were based on the Energy Star website's assumption that 15-25% of a home's energy requirement go toward heating water (most of these facilities are smaller and more comparable to homes), and that on-demand units reduce the required energy by 45-60%. Therefore, the overall savings was estimated at 10% of the electricity use for those facilities.

For the two facilities in which an HVAC upgrade was recommended, the Energy Star middle number for savings was used for both electricity and natural gas (20% reduction). Based on the expected payback periods compared with those of the average HVAC upgrade, these reduction estimates are probably low.

Another upgrade, the occupancy sensors for refrigerated vending machines, used data from the VendingMiser web site, which states that these units save \$100-150/year in electricity costs. Using the average cost/kWh of \$0.076, this translates to 24,671 kWh/year savings for the 15 refrigerated machines in County facilities. Data regarding PSE's free upgrade of these units was provided by Ted Brown.

With respect to the LEED standard for additional facilities, calculation of potential savings was based on the assumed growth in energy requirements from 1.5% annual growth in the municipality. Data on savings to be gained through LEED construction were taken from *LEED Building Performance in the Cascadia Region: A Post-Occupancy Evaluation Report*. In summary, the buildings in the report saw average energy reductions of almost 40%, and so a reduction potential of 35% was used for this measure.

Lighting upgrades: Whenever possible, the potential energy savings due to a current or proposed lighting upgrade was taken directly from a PSE estimate for that facility. These were available for the Central Shop, Health Department building, Plantation Rifle Range, and the Bellingham Senior Center. For others, an estimate of potential savings was based on Energy Star data that show lighting consuming about 25% of the electricity in a building, and that upgrades can reduce those requirements by 40%. Therefore, the estimated electricity savings for other un-quantified facilities was 10%.

Regarding the switch of all street signals to LED, the cost and potential savings per unit were provided by Ted Brown of PSE.

Conservation Resource Analyst: The potential savings from hiring this position are based on Puget Sound Energy's Resource Conservation Manager Program. Numbers were estimated based on data provided by Ted Brown of PSE: An RCM can typically expect to bring about 10-15% savings in electricity and natural gas requirements. Therefore, the reduction for this measure was based on a 10% decrease in both sources from 2005 usage.

Green Power Purchase: The existing measure for green power purchase is based on the 2007 contract with Puget Sound Energy for 100% green power for County operations.

### ***Fleet Vehicles***

The County currently owns 16 hybrid Toyota Priuses, and for 2005 data were available to calculate their exact fuel usage based on in-house and out-of-house data. This number was then plugged into the CACP software and compared to what usage would have been from non-hybrid mid-sized sedans to determine the resultant emissions reduction. For increased purchase of Priuses, the estimate of about 2 new cars per year was provided by Eric Schlehber of Equipment Services. Assuming these vehicles will be driven approximately 10,000 miles per year (less than the national average because they are only used 5 days per week) and that they replace mid-sized sedans, a reduction in emissions was estimated.

The proposed switch to 10% ethanol and 5% biodiesel is based on upcoming State legislation that will require those levels by approximately 2012. The numbers used to gauge emissions reduction were based on 2005 fuel consumption.

Reducing VMT of the County fleet by 3% was a rough but hopefully plausible estimate of the effects that could be achieved through an educational campaign geared toward employees' driving habits.

Numbers for the reduction in Sheriff's vehicle miles traveled were based on Undersheriff Carey James' statement that officers used to drive on average 1.5 hours per day to get to and from work. Since there are 4 officers working at any given time and they work 10 hour shifts, there were 68 of these trips per week. At an estimated speed of 40 mph, these officers were driving an extra 212,000 miles per year in vehicles that only get about 10-15 mpg on average.

### ***Employee Commute***

There are two measures that seek to reduce employee commute: increases in bus ridership and increases in walking, biking, and carpooling to work. The second measure's expected outcome was a rough estimate of what might result from an educational campaign surrounding the effects of commuter traffic.

The first measure, an increase in transit use, was based on the assumption that free transit would spur 10% of employees to ride the bus to work half of the time. The VMT reduction is based on total number of employees and the trip-distances they travel, which was calculated in the emissions inventory portion of this report. The price to Whatcom County is based on current rates of \$150/year for a WTA pass, as is posted on their website.

## **Appendix B- Whatcom County Council Resolution #2006-033**

Establishes support for Whatcom County's participation in the ICLEI Cities for Climate Protection campaign.

<http://www.whatcomcounty.us/council/2006/res/res2006-033.pdf>

## **Appendix C – Whatcom County Council Resolution #2006-058**

Establishes the intent to purchase green electricity for 100% of County operations.

<http://www.whatcomcounty.us/council/2006/res/res2006-058.pdf>

**Appendix D – Additional Service Request to fund the Energy Conservation and Climate Protection Program**

*(see next page)*



## 2007-2008 Budget Preparation - Regular Additional Service Request

**Administrative Services**

**Administration**

ASR # 2007- 344    Fund 507    Cost Center 507100    Originator: Linda Harduar .

Expenditure Type: Ongoing                      Add'l FTE                       Add'l Space                       Priority 1

**Name of Request: Climate Protection and Energy Conservation Program**

Costs:	Object	Object Description	2007 Amount	2008 Amount
	4369.9001	Miscellaneous Revenues	(\$21,000)	(\$21,000)
	6110	Regular Salaries & Wages	\$39,682	\$42,074
	6210	Retirement	\$3,214	\$4,001
	6230	Social Security	\$3,036	\$3,219
	6245	Medical Insurance	\$8,784	\$9,662
	6255	Other H&W Benefits	\$1,368	\$1,423
	6259	Worker's Comp-Interfund	\$582	\$582
	6269	Unemployment-Interfund	\$198	\$210
	<b>Request Total</b>		<b>\$35,864</b>	<b>\$40,171</b>

**1. Description of Request:**

**a) Describe the proposed activity or service.**

This demonstration program would be responsible for:

Management and minimization of electricity and gas use in all County facilities

Employee education surrounding energy use

Researching and installing low cost energy-saving options for County facilities (such as occupancy sensors for lighting, LED exit signs, on-demand hot water in small buildings, etc)

Initiating implementation of biodiesel and ethanol use in fleet vehicles

Constructing and helping to implement a plan that will reduce overall vehicle miles traveled (VMT) in County fleet, through employee education and potentially more intensive vehicle use management

**b) Who are the primary customers for this service?**

All residents of Whatcom County would benefit from this service through a reduction in energy costs and an overall healthier natural environment.

**2. Describe the problem this request addresses and why Whatcom County needs to address it.**

A large amount of energy use appears to be able to be reduced in locations throughout the County's operations. This has two negative impacts on Whatcom County taxpayers: first, an excess of money is being spent on this energy, and secondly it directly adds to our organization's greenhouse gas emissions, forwarding the condition now widely accepted scientifically as global warming.

**3. Options**

**a) What other options have you considered? Why is this the best option?**

1. One option is business as usual, whereby the County continues to pay more than is necessary to deliver the appropriate services to the community.

2. Another option is to share this employee with the City of Bellingham or the Cities of Ferndale and Lynden, who have all expressed interest in such an opportunity. However, this option will limit the

## 2007-2008 Budget Preparation - Regular Additional Service Request

### Administrative Services

### Administration

ASR # 2007- 344 Fund 507 Cost Center 507100 Originator: Linda Harduar

effectiveness of an employee due to the necessity of focusing on multiple municipalities.

#### **b) What are the specific cost savings? (Quantify)**

According to PSE, the energy savings from an energy saving and resource-focused program can be anywhere from 5% to 15% of total expenditures. The level of savings is largely dependent upon how resource-conscious an organization was before the program is implemented. Between electricity and natural gas, Whatcom County spent over \$600,000 in 2005. Expected savings from the efforts of this program would be between \$30,000 and \$90,000 per year. This does not account for transportation or waste costs and savings. The County spends an additional \$800,000 per year on these costs. A modest 3% reduction would save the County another \$24,000 per year.

This program would be within \$3,000 of paying for itself even with minimal reductions (\$54,000). With a 5% reduction in transport/waste costs, this position would save \$150,000 per year and pay for itself almost three times over.

#### **4. Outcomes / Objectives**

##### **a) What outcomes will be delivered and when?**

Over the next two to three years, this program will:

- Reduce the energy requirements of existing county facilities by 10-15%
- Implement a plan to reduce vehicle miles traveled (VMT) of fleet vehicles by 3%
- Initiate a program in which all fleet vehicles use either 5% biodiesel or 10% ethanol
- Reduce the carbon emissions of commuting employees by 5%

##### **b) How will you know whether the outcomes happened?**

The ICLEI emissions inventory has provided a baseline for 2005, against which progress would be measured in the future.

#### **5. Other Departments/Agencies**

##### **a) Will this ASR impact other departments or agencies? If so, please identify the departments and/or agencies impacted and explain what the impact(s) will be.**

This ASR will impact all other departments. At least two educational campaigns will be launched among County employees; one will focus on reducing energy use and the other will bring awareness to employee driving habits, both in personal and County vehicles. Therefore, this program will work closely with department heads to ensure support for these initiatives.

In addition, other efforts of this program will specifically involve at least four other departments:

**Facilities:** This program will work with Facilities Management to find more efficient ways to manage County energy use in the buildings managed by this department.

**Parks:** This program will work with Parks leadership to find additional ways to conserve energy in Parks facilities.

**Equipment Services:** This program will work with PW leadership to plan both the vehicle miles traveled (VMT)-reduction efforts and the biodiesel/ethanol pilot programs.

**M&O:** This employee will work with Public Works Administration and M&O to audit the street lights and signals owned by the County.

##### **b) If another department or agency is responsible for part of the implementation, name the person in charge of implementation and what they are responsible for.**

Many of this program's efforts will be made in conjunction with the parties listed in 5(a).

#### **6. What is the funding source for this request?**

Initially, the funds for this program will come partially from the General Fund. However, Puget Sound Energy provides funding for this type of program based on the assumption that it will substantially reduce

Thursday, September 14, 2006

Rpt: Rpt ASR Regular

## 2007-2008 Budget Preparation - Regular Additional Service Request

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### Administrative Services

### Administration

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ASR # 2007- 344    **Fund 507**    **Cost Center 507100**    **Originator: Linda Harduar**

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the energy requirements of the organization. This equals up to 25% of the first year's cost, based on the utility fees paid.

In addition, ICLEI and the Cities for Climate Protection program have several agency partners and sponsors, who could potentially provide additional funding for this program.

Finally, County-wide savings in electricity, natural gas, vehicle fuel, and waste disposal costs that result from this program's efforts can be expected to pay for the entire program in less than three years.

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Thursday, September 14, 2006

Rpt: Rpt ASR Regular

**Appendix E – Job Description for Conservation Analyst position  
WHATCOM COUNTY JOB DESCRIPTION**

<b>POSITION:</b>	<b>Conservation Resource Analyst</b>	<b>RANGE:</b>	<b>240</b>
<b>DEPARTMENT:</b>	<b>Administrative Services</b>	<b>FLSA:</b>	<b>E</b>
<b>REPORTS TO:</b>	<b>Director</b>	<b>EEO:</b>	<b>2</b>

**SUMMARY**

Performs varied professional and technical work in compiling and analyzing data. Coordinates the collection and development of necessary data and other relevant information related to energy conservation and emission reduction. Maintains effective relations with County departments, other initiating governments, public agencies and interest groups. Fosters public understanding, support and involvement. Plans, promotes, conducts and presents at public meetings. Analyzes problems, issues and situations and develops and implements recommendations as assigned. Effectively performs program coordination across County departments. Works independently under general direction.

*Depending upon assignment, the incumbent may perform some or all of the following duties, which are a representative sample of the level of work appropriate to this classification.*

**ESSENTIAL JOB DUTIES**

Prioritizes and plans work activities using resources effectively. Responsible for organizing, coordinating and facilitating the efforts of diverse individuals, groups and agencies in the County government and Whatcom County community.

Plans, promotes, conducts and presents at public meetings. Works with County departments; local, state and federal governments/agencies; private citizens; committees; and other special interest groups as appropriate to ensure participation, and identify needs and proposed solutions.

Analyzes and coordinates the collection and development of necessary data and other relevant information related to energy use and emissions; establishes and maintains prioritized updated list of conservation resource problems/issues. Recommends and implements programs aimed at the reduction of energy and resource use in the County. Identifies gaps in current data and develops methods of filling those gaps. Reviews and analyzes existing/pending reports, plans, studies and regulations related to resource conservation within the County. Prepares and completes reports on time with supporting conclusions and recommendations.

Researches and utilizes appropriate funding opportunities. Ensures all requirements of grants, contracts and agreements are met. Negotiates and completes all associated paperwork and processes for intergovernmental agreements, grants, contracts, etc. on behalf of the County and follows through with needed actions to obtain legal consideration and adoption; manages grant implementation, including responsibility for expenditure of assigned funds, maintaining appropriate financial records, and ensuring contract and grant compliance.

Works with County departments and other public and private entities on implementation measures including education programs. Develops and implements actions, activities and programs to provide educational information and involvement opportunities for citizens, elected officials, agencies/interest groups and the public to facilitate implementation of solutions which are based on an understanding of the issues. Ensures analysis and recommendations are consistent and in compliance with relevant local, state, and federal law.

Tracks, comments and participates on local/state committees involved in resource conservation actions. Monitors laws and legislation and responds as needed.

### **ADDITIONAL JOB DUTIES**

Participates as part of the management team in planning, systems analysis, program evaluation, budget preparation, cost estimating, and problem solving activities. Evaluates internal or interdepartmental policies and procedures, recommends modifications or develops new administrative policies, processes, or structures to resolve problems and increase efficiency.

Performs work on special projects that may be outside normal area of assignment, as directed.

Performs other duties as assigned.

### **QUALIFICATIONS**

Requires Bachelor's of Science degree with an emphasis in environmental science and two years of increasingly responsible experience in the areas listed below.

Experience should include a minimum of two years of experience in: researching, developing and implementing programs; public contact, involvement in decision-making process; and coordinating with multiple departments, agencies and interested public groups and individuals.

A Master's degree in a field directly applicable to the scope of responsibility of the position or advanced technical certification in the fields of environmental science, biology management, planning or related fields is preferred and may substitute for one year of required experience.

Grant management experience is desired.

#### ***Requires knowledge of:***

The field of assignment sufficient to perform thoroughly and accurately the full scope of responsibility as illustrated by example in this job description.

Current principles, practices, strategies and techniques related to the conservation of energy, specifically that which is derived from fossil fuel sources.

Roles and relationships among and within relevant local, state and federal groups and agencies.

Applicable local, state and federal laws, regulations and policies including grant, contract and funding application procedures, monitoring and contract negotiations.

Computer operation and a variety of software for spreadsheet, database, graphic and word processing applications.

Safety precautions, practices and procedures applicable to the area of assignment.

#### ***Requires the ability to:***

Listen attentively and communicate effectively and persuasively, both orally and in writing, with individuals and groups, in clear, concise language appropriate for the purpose and parties addressed, concerning complex issues, including making presentations to diverse audiences and preparing comprehensive reports in non-technical language easily understood by a diverse audience.

Use tact, discretion, persuasion, diplomacy, respect and courtesy to gain the cooperation and commitment of others, facilitate groups, and to establish and maintain effective working relationships and rapport with departments, officials, the media, representatives of other groups, agencies, entities or businesses, and diverse members of the public.

Organize, prioritize and coordinate work projects, plans and assignments. Be attentive to detail, maintain a high degree of accuracy and recognize, resolve and correct discrepancies in data or information. Be flexible, work in a multi-task environment, easily adapt to shifting priorities, manage competing demands, set and achieve goals, adapt quickly to new and changing technology.

Read, understand, interpret and apply appropriately the terminology, instructions, policies, procedures, legal requirements and regulations pertinent to the area of assignment.

Take appropriate initiative. Apply good judgment, creativity and logical thinking to obtain potential solutions to problems within scope of knowledge and authority or refer to the appropriate source.

Provide recommendations for short- and long-range plans, goals and objectives.

Initiate, compile, compose and/or edit correspondence, records, narrative, reports and other documents relevant to the area of assignment.

Work independently or cooperatively as a member of a team.

Fulfill the commitment of the County to provide outstanding public, inter- and intra-departmental service.

Research, collect, analyze, organize, compile and present a variety of research data accurately and clearly in written or graphic form including computer-generated products. Conduct field inspections, analyze findings and prepare logical findings and recommendations.

Proficiently and accurately operate office equipment standard to the area of assignment including a computer with word processing, graphic, spreadsheet and database applications.

Maintain appropriate level of confidentiality.

### **SPECIAL REQUIREMENTS**

Must have a driving record that meets County standards and possess a valid driver's license at time of hire and throughout employment.

Background check must meet County criteria.

Must pass job-related tests.

### **WORKING CONDITIONS**

Work is performed primarily in an office or meeting room setting. Moves throughout County facilities. May drive to other County facilities or outside the County. May be required to attend meetings or perform duties outside of normal office hours. May sit for long periods while performing duties. May occasionally carry materials, files, boxes or equipment weighing up to 20 pounds. Possibility of exposure to hostile and offensive language from the public. Uses appropriate safety equipment and follows established work safety policies, practices and procedures.

The statements contained herein reflect general details as necessary to describe the principal functions of this job, the level of knowledge and skill typically required and the scope of responsibility, but should not be considered an all-inclusive listing of work requirements. Individuals may perform other duties as assigned, including work in other functional areas, to cover absences or relief, to equalize peak work periods or otherwise to balance the workload. At its sole discretion, Whatcom County may consider combinations of education, experience, certifications, and training in lieu of specifically required qualifications contained herein.

Whatcom County's policy is to provide equal opportunity in all terms, conditions and privileges of employment for all qualified applicants and employees without regard to race, color, creed, religion, sex, age, national origin, marital status, sexual orientation, disability, or veteran status.

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**Employee Status: This is an FLSA-exempt position and as such is not entitled to overtime. The position is also subject to an "employee at will" doctrine.**

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Signature

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Date

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- <sup>i</sup> From the *International Herald Tribune*, November 15, 2006. Available online at: <http://www.iht.com/articles/2006/11/15/news/climate.php>
- <sup>ii</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/syren/spm.pdf>
- <sup>iii</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)
- <sup>iv</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/syren/spm.pdf>
- <sup>v</sup> Ibid
- <sup>vi</sup> Ibid
- <sup>vii</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>
- <sup>viii</sup> Climate Impacts Group. 2006. "Pacific Northwest 20th Century Climate Change." <http://www.cses.washington.edu/cig/pnwc/cc.shtml#figure1>
- <sup>ix</sup> North Cascades Glacier Climate Project. 2006. <http://www.nichols.edu/departments/Glacier/>
- <sup>x</sup> North Cascades Glacier Climate Project. <http://www.nichols.edu/departments/Glacier/>. 2006.
- <sup>xi</sup> U.S EPA. <http://yosemite.epa.gov/oar/globalwarming.nsf/content/ActionsStateLegislativeInitiatives.html>
- <sup>xii</sup> Regional Greenhouse Gas Inventory: <http://www.rggi.org/agreement.htm>
- <sup>xiii</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>
- <sup>xiv</sup> Puget Sound Clear Air Agency's "Roadmap for Climate Protection." Online at: <http://www.pscleanair.org/news/library/reports/rptexecsum.pdf>
- <sup>xv</sup> California Integrated Waste Management Board. "Statewide Waste Characterization Study: Results and Final Report." 1999
- <sup>xvi</sup> "Costing Green: A Comprehensive Cost Database and Budgeting Methodology." Available online at: [http://www.usgbc.org/Docs/Resources/Cost\\_of\\_Green\\_Full.pdf#search=%27Costing%20Green:%20Davis%20Langdon](http://www.usgbc.org/Docs/Resources/Cost_of_Green_Full.pdf#search=%27Costing%20Green:%20Davis%20Langdon)
- <sup>xvii</sup> <http://www.hybridcars.com/sales-sumbers.html>
- <sup>xviii</sup> Anti-Idling. 2006. US Environmental Protection Agency. Available Online at: <http://epa.gov/cleanschoolbus/antiidling.htm>
- <sup>xix</sup> Anti-Idling. 2006. US Environmental Protection Agency. Available Online at: <http://epa.gov/cleanschoolbus/antiidling.htm>
- <sup>xx</sup> "Costing Green: A Comprehensive Cost Database and Budgeting Methodology."