Town of La Conner

Greenhouse Gas Inventory & Proposed Climate Action Plan

June, 2010

Note from the Mayor

The Administration and Council have recognized that addressing resource management and energy usage has both direct and indirect impacts environmentally and economically. It is important for the Town of La Conner to take positive actions to reduce our carbon emissions, conserve energy and manage its resources effectively. This plan is our initial best effort to serve as guidance to Town government and the citizens of La Conner.

Acknowledgements

The Town of La Conner would like to acknowledge all of the individuals whose hard work contributed to the development of this document. We would like to specifically acknowledge the contribution by Amy Shatzkin of ICLEI in establishing the initial baseline and draft plan in 2006. Many thanks go to all of the employees of La Conner, who have been extremely generous with their time. In addition, Alex Ramel provided detailed assistance and support at all stages of this project, which would not have been possible without the support and guidance of the Northwest Clean Air Agency.

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Town of La Conner Climate Action Plan

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Executive Summary

The Town of La Conner has chosen a proactive policy with regard to greenhouse gas emissions. La Conner has pledged to take action by passing a resolution to join other local governments and governments worldwide to reduce greenhouse gas emissions. Initially, La Conner participated in ICLEI's Cities for Climate Protection® (CCP) Campaign. In so doing, the town has committed to work on ICLEI's Five Milestone Process to prevent global warming as resources and staff time allows:

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 City of La Conner's Proposed Climate Action Plan
The Climate Action Plan for La Conner includes a greenhouse gas emissions inventory for a selected baseline year (2005) and for both the community and the municipal operations of the Town. The community inventory includes greenhouse gas emissions from the residential, commercial, and industrial sectors, the transportation sector, and methane released from solid waste. The municipal inventory includes greenhouse gas emissions from municipal buildings/facilities, vehicle fleet, water & sewage, employee commute, street and traffic lights, and solid waste. Moreover, the inventory also includes forecast emissions for the selected target year of 2020 based on a business-as-usual scenario.

Based on the results of the inventory, it is recommended that La Conner adopt an emissions reduction target of 20% below 2005 levels by 2020. A 20% reduction below 2005 levels means a reduction of 5,925 tons of eCO2 by 2020. Several proposed measures have been outlined to help La Conner reach this goal.

The good news is that La Conner is already on the way to reaching this goal. Several existing measures that have recently been put into place have the potential to lower the rate of forecast emissions from the business as-usual scenario. Some of these factors include the high green power purchasing rate within the residential sector and the Town's focus on creating infill development and capping community growth . Additional recommended measures are outlined in this report. These combined measures will help La Conner achieve up to 50% of its reduction target in the coming years. An evaluation of progress towards the reduction target is recommended to occur by 2012.

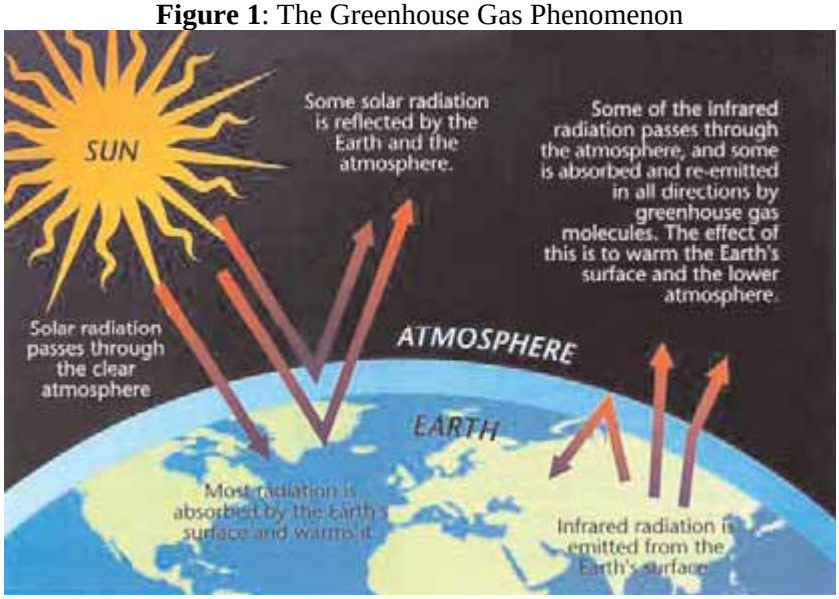
In addition to mitigating the destabilization of the climate and associated effects, La Conner stands to benefit in many ways from the proposed measures outlined in this report. Many of the proposed measures have additional benefits such as financial savings resulting from improved energy efficiency, a more walkable community, improved air quality, increased energy security, encouragement of an emerging renewable energy sector to boost the regional economy, and most importantly, the knowledge that La Conner is doing it's part to curb the trend of global warming and leave our planet a better place for the next several generations.

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 60ºF. Carbon dioxide (CO_2) is the most prolific of these gases. Other contributing gases include methane (CH_4), nitrous oxide (NO_2), ozone (0_3) and halocarbons. Without the natural warming effect of these gases the 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. The global average surface temperature increased during the 20th century by about 1°F. [1]According to NASA scientists, the 1990s were the warmest decade of the century, and the first decade of the 21st century is well on track to be another record-breaker. The years 2002, 2003, 2004, 2005, 2006, 2007 and 2009 along with 1998, were the warmest years since the 1890s, with 2005 being the warmest year in over a century. [2]

Scientific Facts and Projections:

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

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

[1] 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/syreng/spm.pdf
[2] NASA Goddard Institute for Space Studies, http://www.nasa.gov/topics/earth/features/temp-analysis-2009.html

The climate and the atmosphere do not react in a linear fashion to increased greenhouse gases. That is to say that you cannot simply predict that for each ton of carbon dioxide emitted from a power plant or a vehicle's tailpipe, the Earth will warm a certain amount. The Earth's climate has a number of feedback loops and tipping points that scientists fear will accelerate global warming beyond the rate at which it is currently occurring. For example, as CO_2 emissions have increased in recent human history, the oceans have been absorbing a significant portion of these gases, but as the oceans become more permeated with CO_2, scientists anticipate they will reach a saturation point, after which each ton of anthropogenic emissions of CO_2 will have a more substantial impact.[3] Another example of this compounding can be found in the polar ice caps. Ice is highly reflective and acts effectively like a giant mirror, reflecting the sun's rays back into space. As the planet warms and some of this ice melts away, a darker land or ocean surface is revealed. This darker surface will tend to absorb more heat, accelerating the speed at which the planet warms with each ton of greenhouse gas emitted. As these examples illustrate, the stakes are high, and there is no time to lose in the race against global warming.

B. Effects & Impacts of Climate Change

Global Impacts

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

The increase in the temperature of the oceans is projected to accelerate the water cycle, thereby increasing the severity and rate of both storms and drought, which, along with decreased snow pack, could disrupt ecosystems, agricultural systems and water supplies.

Globally, snow cover has decreased by over 10% in the last forty years. Average sea level has risen 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.[5] These coastal infringements on such a large scale could lead to not only significant environmental and ecosystem disturbances, but also major population displacement and economic upheaval. This is of significant importance to La Conner being located in an estuary.

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. [6] (All subsequent mention of climate

[3] 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/syreng/spm.pdf
[4] Ibid
[5] Ibid
[6] Littell, J.S., M. McGuire Elsner, L.C. Whitely Binder, and A.K. Snover (eds). 2009. The Washington Climate Change Impacts Assessment: Evaluating Washington's Future in a Changing Climate - Executive Summary. In The Washington Climate Change Impacts Assessment: Evaluating Washington's Future in a Changing Climate, Climate Impacts Group, University of Washington, Seattle, Washington.
Available at: www.cses.washington.edu/db/pdf/wacciaexecsummary638.pdf

impacts in Northwest, aside from the studies directly cited, reference the Climate Impacts Group 2005 study.) ***Natural disasters*:** The Climate Impacts Group has found that local climate trends will reflect continued increases in both average air and water temperatures. Additionally, earlier snowmelt may cause changes in river and stream flows. Another significant change will be a shift from a snowpack based watershed to a rain based water supply. This will likely cause an increase in river flood events and drought conditions. Sea level rise and increased seasonal flooding could incur considerable costs as these phenomena pose risks to property, infrastructure and even human life.

Impact on water: Water quality and quantity are also at risk to be depleted as a result of changing temperatures. With warmer average temperatures, more winter precipitation will fall in the form of rain instead of snow, shortening the winter snowfall season and accelerating the rate at which the snow pack melts in the spring.

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

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

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

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

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

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

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

Figure 2a: Precipitation trends (1920-2000)

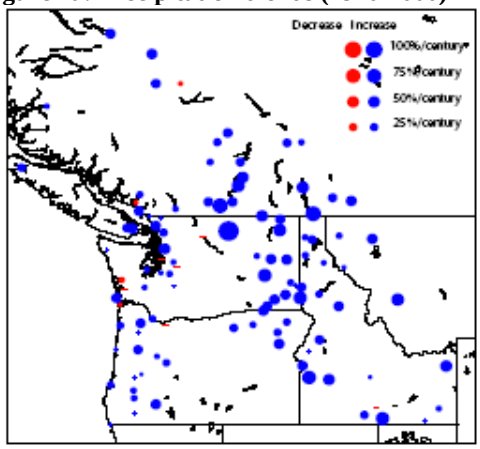
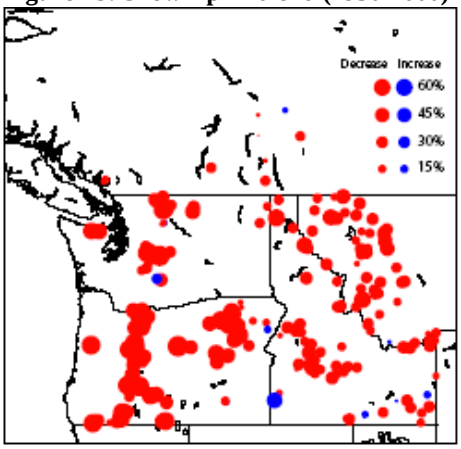


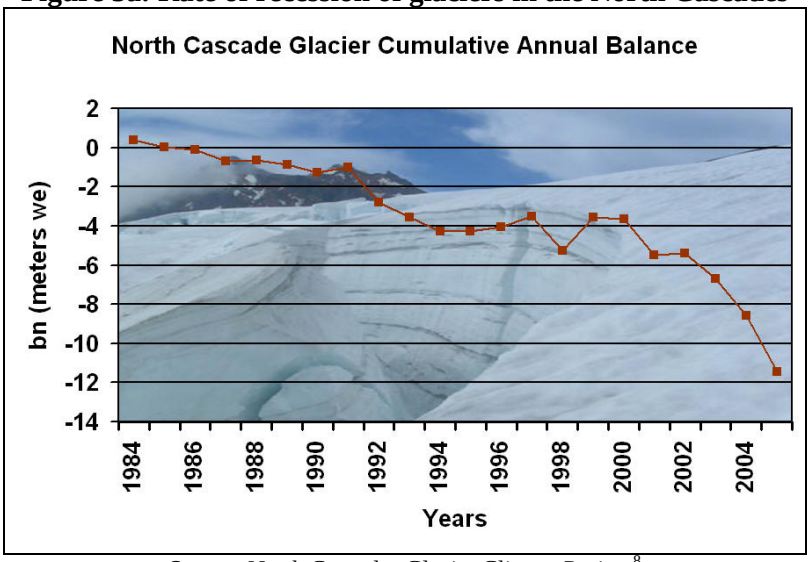
Figure 2b: Snow Apr 1 trend (1950-2000)



Source: Climate Impacts Group, University of Washington, 2006[7]

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

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



Source: North Cascades Glacier Climate Project[8]

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

[8] North Cascades Glacier Climate Project. 2006. http://www.nichols.edu/departments/Glacier/

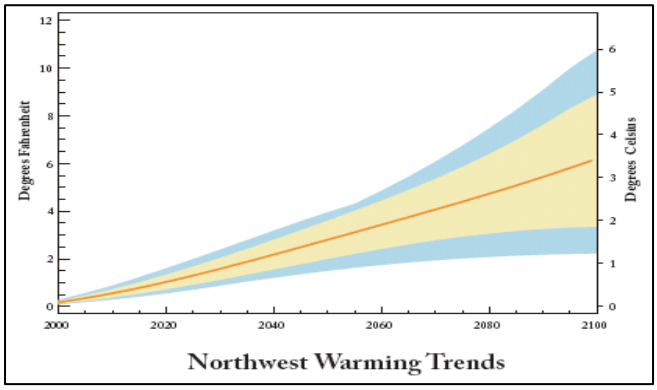
Figure 3b: Eye-witness North Cascades Glacier Recession

Source: North Cascades Glacier Climate Project[9]

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

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

Figure 4: Temperature under increased emissions scenarios



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

[9] North Cascades Glacier Climate Project. http://www.nichols.edu/departments/Glacier/. 2006.

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 affects of climate disruption. A survey published in 2003 found that legislatures in 21 different states had passed legislation specifically directed at climate change.[10] The most common laws covered by the survey call for studies of the impacts of climate change, require inventories of the states' greenhouse gas emissions and creation of commissions to study the possible implications of greenhouse gas trading systems.

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

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

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

SHB 3141 (2004) This bill initiates the process of regulating carbon emissions by requiring fossil fueled thermal power plants with a generating capacity of 25 MW or more to provide mitigation for 20 percent of the CO_2 emissions produced by that plant over a period of 30 years.[12]

ESHB 1397 (2005) Commonly called the "clean cars bill," this legislation adopts the California emissions standards for new cars, which are stricter than national standards. While the California standards, as they now stand, will have significant impact on the ambient air quality in our region, it will have only a minor impact on CO_2 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_2 emissions significantly.

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

[10] U.S EPA. http://yosemite.epa.gov/oar/globalwarming.nsf/content/ActionsStateLegislativeInitiatives.html
[11] Regional Greenhouse Gas Inventory: http://www.rggi.org/agreement.htm
[12] 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

Local Action

A great deal of work is being done at the local level on climate change as well. ICLEI—Local Governments for Sustainability has been a leader on both the international and local level for more than ten years, representing over 770 local governments around the world. ICLEI was launched in the United States in 1995 and has grown to over 200 cities and counties providing national leadership on climate protection and sustainable development. In June 2006, ICLEI and the Northwest Clean Air Agency partnered to launch the Northwest Climate Protection and Energy Conservation Project funding, among other things, this report.

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

D. ICLEI and the Cities for Climate Protection Campaign

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

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

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

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

In May of 2006, the Town of La Conner adopted a resolution to take action for climate protection and officially joined ICLEI's Cities for Climate Protection Campaign. This report signals the completion of steps one through three in the Milestone process, and presents the Town with a draft Climate Action Plan.

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_2. 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_2.

The emissions coefficients and methodology employed by the software are consistent with national and international inventory standards established by the UN Intergovernmental Panel on Climate Change (1996 Revised IPCC Guidelines for the Preparation of National Inventories) and the U.S. Voluntary Greenhouse Gas Reporting Guidelines (EIA form1605).

The CACP software has been and continues to be used by over 200 U.S. cities and counties to reduce their greenhouse gas emissions. However, it is worth noting that, although the software provides the Town of La Conner with a sophisticated and useful tool, calculating emissions from energy use with precision is difficult. The model depends upon numerous assumptions, and it is limited by the quantity and quality of available data. With this in mind, it is useful to think of any specific number generated by the model as an approximation, rather than an exact value.

2. Inventory Sources and Creation Process

The creation of an emissions inventory required the collection of information from a variety of sectors and sources. 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 the Town of La Conner and its contribution to greenhouse gas emissions. The municipal inventory is a subset of the community inventory, and includes energy use and emissions 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 the government-related emissions, the Town of La Conner takes a visible leadership role in the effort to address climate change. This is important for inspiring local action in La Conner. Both the community and municipal inventories are based on the year 2005.

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

B. Baseline Year Inventory Results

Table 1: La Conner Emissions Summary – 2005

	Community Analysis	Municipal Operations Analysis
Base Year: 2005		
eCO_2 Emissions in (tons)	15,435	520

Source: CACP Model output

1. Community Emissions Inventory - 2005

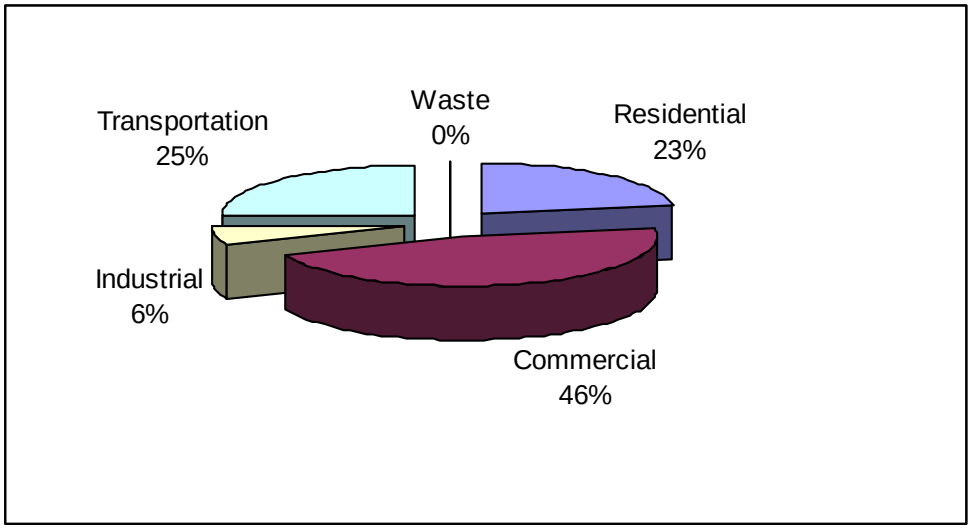
In the base year 2005 the community of La Conner, which includes the residential, commercial and industrial sectors, emitted approximately 15,435 tons of eCO_2. The single greatest source of emissions came from electricity and natural gas use in the commercial sector, followed by vehicle emissions from the transportation sector. Table 2 and Figure 5 below show the breakdown of community emissions by source type.

Table 2: La Conner Community Emissions Summary – 2005

Potential Sources	Equiv CO_2 (Tons)	Energy (Million Btu)
Residential	3,516	38,947
Commercial	7,162	74,539
Industrial	930	9,260
Transportation	3,945	45,979
Waste	-118	
TOTAL	15,435	168,725

Source: CACP Model output

Figure 5: La Conner Community Greenhouse Gas Emissions by Sector - 2005

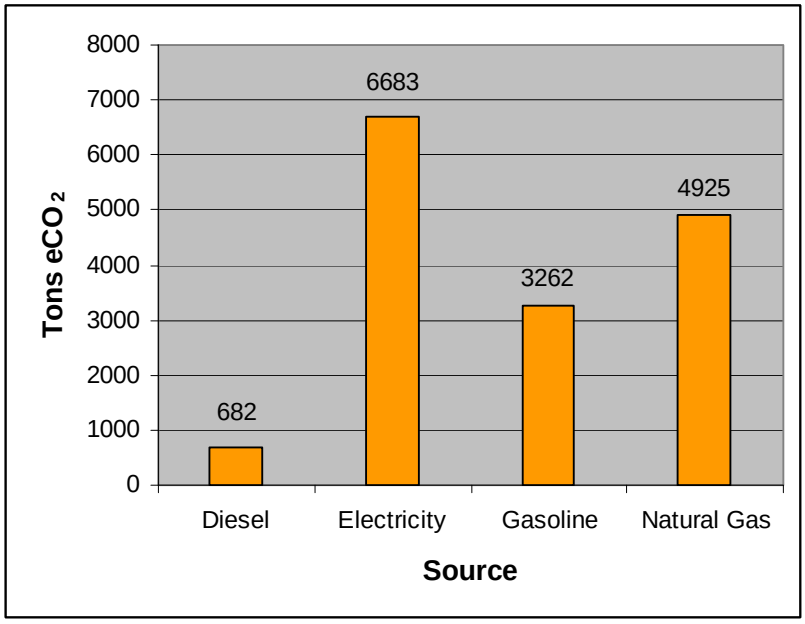


Source: CACP Model output

Energy/Stationary Source Emissions

Emissions from the residential, commercial, and industrial sectors in La Conner are primarily composed of stationary sources – and account for 75.2 % of the community's energy-related emissions. Stationary sources refer to emissions generated from fixed places or objects, such as buildings and homes, from which pollutants are released. Seventy percent of La Conner's emissions came from stationary sources within these three sectors.

Figure 6: La Conner Community Greenhouse Gas Emissions by Energy Source – 2005



Source: CACP Model output

Transportation Emissions

Emissions from the transportation sector account for 25% of the community's greenhouse gas emissions. This number might be a bit smaller than otherwise expected due to a few - the average vehicle miles traveled (VMT) for the Town's residents was calculated by focusing on travel within the town limits (although an analysis of traffic on arterials leading in and out of town was also incorporated into this figure and should also account for the some of the tourist travel in and out of town) the Town's small size, coupled with its compact downtown enables higher than usual pedestrian activity and less of a need to carpool children to and from school.

Solid Waste Emissions

La Conner residents sent an estimated 512 tons of municipal solid waste (MSW) to the landfill in 2005. The GHG emissions generated from waste are dependent on the type of waste being disposed of and the configuration of the landfill where waste is disposed. Two processes generally occur in a typical landfill. First, the waste does not completely decompose; causing some of the carbon that would have been released as CO_2 to actually be sequestered in the landfill. Second, because of the lack of oxygen, the decomposing matter is released as methane, a greenhouse gas 21 times more potent than CO_2. If methane is not captured or burned, landfills are net sources of greenhouse gas emissions. And in some cases, waste disposal can be a significant part of a community's climate pollution profile. However, the methane released can be captured to produce energy or it can be burned, which converts it back to the less potent CO_2.

La Conner's waste was sent to Roosevelt Landfill in Eastern Washington, a sanitary landfill with a methane recovery factor of 80%. This means that what does decompose in the landfill is released as methane gas, 80% of which is captured (or "recovered") at the landfill. In La Conner'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 eCO2 emissions from our waste sector are reported as negative You are only capturing 80%. This would be better characterized as an extended release versus removal.). Therefore no emissions were generated from the waste sector, but rather emissions were reduced overall by 118 tons of eCO_2. (Not included in this calculation were the estimated emissions from trucking the waste to the landfill.)

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

2. Municipal Operations Emissions Inventory - 2005

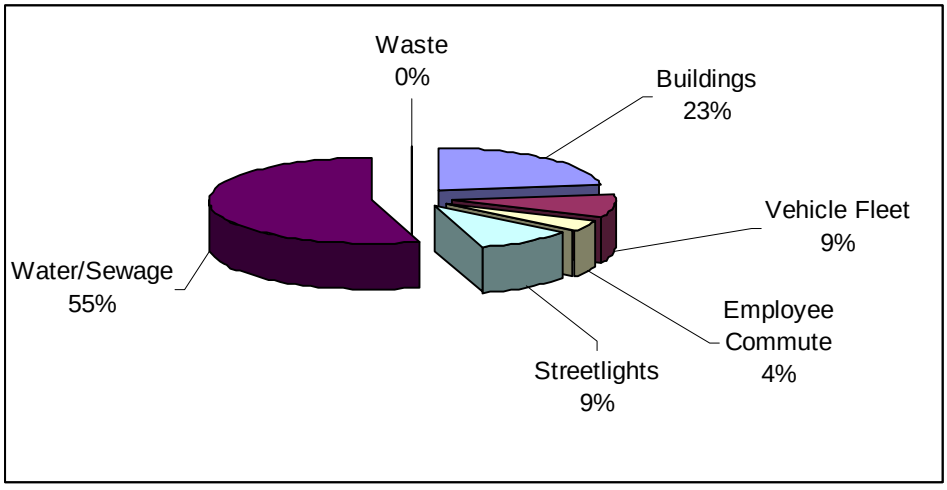
In the base year of 2005, La Conner's municipal operations generated 520 tons of eCO_2. Table 5 and Figure 7 show the breakdown of municipal operations emissions by sector.

Table 5: La Conner Municipal Emissions Summary - 2005

Municipal Sectors	Equiv CO_2 (Tons)	Energy (Million Btu)	Cost ($)
Buildings	120	1,317	17,676
Vehicle Fleet	47	550	11,023
Employee Commute	23	268	
Streetlights	50	323	11,578
Water/Sewage	289	1,858	38,931
Waste	-9		20,093
TOTAL	520	4,315	99,302

Source: CACP Model output

Figure 7: La Conner Municipal Greenhouse Gas Emissions – 2005



Source: CACP Model output

In 2000, municipal emissions in La Conner constituted about 3.3 % of the City's total emissions. Local government emissions typically fall between 2 to 5 % of overall community emissions. As a minor contributor to total emissions, actions to reduce municipal energy use will have a small impact on the Town of La Conner's overall community emissions levels. However, municipal action has an important symbolic value and demonstrates leadership that extends beyond the magnitude of emissions actually reduced.

Energy/Stationary Source Emissions

Across sectors, the vast majority of municipal emissions came from stationary sources using electricity. This is largely due to the energy intensity of the wastewater treatment plant.

Transportation Emissions

Emissions from the city's vehicle fleet and the employee commute category accounts for 9 % of the Town's emissions. The vehicle fleet includes all of the vehicles owned and operated by the Town, as well as the Sheriff's mileage within the Town. This included the Administration, Public Works Department, Fire Department (only the two vehicles owned and operated by the Town) as well as the Sheriff's Department stationed in La Conner. (Because the Sheriff's Department covers a larger jurisdiction than the town, only one quarter of their total vehicle miles was included in this calculation, as that is the estimated proportion of their travel that occurs within the Town.). This calculation may be a percent or two low, as heavy trucks were used as a proxy for heavy equipment (e.g. tractors, street sweepers), which the software doesn't have the capacity to calculate.

With 8 full time employees and 3 part-time employees, the Town of La Conner's employees accounted for 4 % of municipal emissions. The employee commute figure only includes the travel of the Town's direct employees – contract employees were not included in this figure. It's interesting to note that the municipal commute is equal to almost one half of the municipal fleet's emissions.

Solid Waste Emissions

In 2005, the Town of La Conner disposed of 239 tons of MSW with the local disposal company, the vast majority of which was the inorganic solids from the wastewater treatment plant. According to data analysis and estimates made by Kelly Wynn at the Waste Water Treatment Plant and Public Works Director Brian Lease, two fifths of the waste is from the Treatment Plant. Our analysis shows that 18% of the waste was generated by Town operations – from office waste to downtown garbage receptacles and yard debris from public parks. The remaining 82 % is from the waste water treatment facility. Kelly Wynn noted that 2005 represents an unusually high year for the waste stream from thee Treatment Plant because a one-time event in the spring made La Conner responsible for depositing waste related to water treatment for a number of Fidalgo Island communities (Was La Conner responsible for this financially?). However, due to La Conner's waste being sent to Roosevelt Landfill (a landfill with an estimated 80% methane recovery) waste actually ends up serving as a net carbon sink. Therefore no emissions were generated from the municipal waste sector, but rather reduced overall emissions by 9 tons of eCO_2. These calculations are consistent with the methodology described in Section I: Community Emissions Inventory, 2005.

III. Forecast for Greenhouse Gas Emissions

Based on the community and municipal operations emissions inventories developed for La Conner for the base year 2000 and the interim year 2005, our next step was to forecast future emissions generated in our community between the baseline, interim and target years. The emissions forecast represent a business-as-usual prediction of how greenhouse gas (GHG) emissions may change in our community over time. This forecast is essential for setting the reduction target, since the amount of greenhouse gas emissions La Conner has pledged to reduce will be derived from projected emissions.

The year 2020 was selected as the target year for reaching the City's emissions reduction goals. This timeframe was chosen based on the desire for the year to be near enough to incite positive action, while simultaneously being distant enough to allow a reasonable period for the Town of La Conner to achieve its goal. Additionally, 2020 is an attractive target from the perspective of regional consistency, as many neighboring municipalities have also selected 2020 for their target year.

Table 8: La Conner Emissions Summary – Baseline and Target Year Forecast

	Community Analysis	Municipal Operations Analysis
Base Year: 2005		
eCO_2 Emissions (tons)	15,435	502
Target Year: 2020		
eCO_2 Emissions (tons)	25,085	580

Source: CACP Model Output

The following assumptions were made in building the forecast.

Community Emissions: It was assumed that all community emissions would grow by 3.5% across all sectors until the population of the Town reached its maximum "build out" population of 1200 individuals, which will be reached within 11 years of the baseline year of 2005. After that point, emissions would only grow additionally by rates of increase projected for the energy consumption.

Municipal Emissions: While the Town will be increasing its growth rate considerably in the coming years, due to its small size, the infrastructure of the municipal government will not grow at the same pace. In talking with the Town Administrator and Planner, the following assumptions were made for the forecast period – though the Town might hire two additional staff, there would be no minimal growth in the infrastructure of Town operations or administration. Therefore, for the forecast, the energy consumption of Buildings and Streetlights were held to be relatively static. The Vehicle Fleet data was altered to reflect an increase in travel for 2 FTE (one for Administration, one for Public Works). However, because waste and wastewater treatment are a function of overall population growth in the community, these figures were altered to incorporate the Town's rate of growth.

IV. Greenhouse Gas Emissions Reduction Target

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

The recommended reduction target for La Conner is 20% below 2005 emissions by the year 2020 in both the municipal operations and community at large. To reach this target, La Conner's community and municipality must reduce annual emissions by 12,901 tons by the year 2020.

Many factors were considered when selecting a recommended reduction target for La Conner. The Intergovernmental Panel on Climate Change (IPCC) suggests that we could need to achieve as much as a 60% reduction below 1990 levels in order to slow global warming and stabilize the climate. Given this backdrop we strove to select a reduction target that would be both aggressive and achievable given local circumstances. As La Conner's emissions have already begun to decline the city may be uniquely poised to attempt a reduction target even greater than 20% below 2000 levels. It is recommended that progress toward the goal be monitored and the reduction target be reassessed during the 2012 midpoint evaluation.

Some specific local factors to be considered when finalizing the reduction target include estimation of the effects of implemented and planned programs and policies, an approximate assessment of future opportunities to reduce emissions, targets adopted by peer communities, and emissions reductions efforts resulting from policies established by the State of Washington.

Table 9: La Conner Emissions Summary – Baseline, Target Year and Reduction Target

	Community Analysis	Municipal Operations Analysis
Base Year	**2005**	**2005**
eCO_2 Emissions (tons)	15,435	520
Target Year Forecast		
eCO_2 Emissions (tons)	25,085	580
Proposed Reduction Target		
Percent eCO_2 reduction	20%	20%
Reductions Necessary to Reach Target		
eCO_2 Emissions (tons)	**12737**	**164**

Source: CACP Model Output

V. Existing Measures

At both the community-scale and within municipal operations, La Conner has already undertaken a number of programs, policies and projects resulting in reduced greenhouse gas emissions.

A. Existing Community-Scale Measures

La Conner has already undertaken a number of municipal and community-scale measures that reduce the Town's greenhouse gas emissions profile. Because these current measures are imbedded in the base year inventory, they cannot be counted towards the town's future greenhouse gas reduction targets. However, the specific savings from each action is detailed below in order to provide a sense of how these actions may impact future emissions reductions scenarios.

Table 9: Existing Community Greenhouse Gas Emissions Reduction Measures

Policy	Year Initiated	Emissions Averted tons eCO2
Residential Green Power Purchasing	2005	101
Hybrid Cars	2000	81
Total reduction		

Source: CACP Model output

Purchase of Green Energy

Renewable sources of energy, such as electricity produced from the wind, the sun, or otherwise landfilled waste products, will be an increasingly important part of the Northwest's energy future. A number of La Conner residents and businesses have purchased "green tag" certified electricity through PSE's Green Power Program. Currently, 17% of the Town's electricity purchasers buy green power, which has helped to reduce overall community emissions by 101 tons eCO_2 per year.

Community Purchase of Hybrid Vehicles

Members of the La Conner community have begun to reduce their contribution to greenhouse gas emissions through the purchase of efficient hybrid technology vehicles. Currently there are 24 hybrid vehicles (classified either as a Honda Insight or Toyota Prius) registered in La Conner according to the Department of Licensing.[13] At an estimated 15,000 vehicle miles traveled per year and current state average gasoline prices ($3.09 according to the Energy Information Administration)[14], these vehicles reduce an annual $20,000 in fuel expenses and decrease emissions by 83 tons of eCO_2.

[13] WA DOL. Dale Brown – (360) 902-4020; dbrown@dol.doa.gov

[14] EIA: http://www.eia.doe.gov/oil_gas/petroleum/data_publications/wrgp/mogas_home_page.html

B. Existing Municipal Operations Measures

La Conner has also already undertaken a number of municipal operations measures resulting in reduced greenhouse gas emissions that are incorporated into to the base year of 2005. These measures are an excellent first step towards significant reductions of greenhouse gas emissions from municipal operations. According to estimates produced using the CACP software, these measures account for 8 tons eCO_2 reduction.

Table 10: Existing Municipal Greenhouse Gas Emissions Reduction Measures

Policy	Year Initiated	Emissions Averted tons eCO2	$ Savings
Boiler Replacement – Maple Hall	2005	TBC[15]	
Energy Star Equipment	2004	2.8 tons over equipment lifetime	
Compressed Schedules	2004	1 ton	$322.00
Total reduction			

Source: CACP Model output

La Conner has also already undertaken a number of municipal operations measures resulting in reduced greenhouse gas emissions relative to the base year of 2000. These measures are an excellent first step towards significant reductions of greenhouse gas emissions from municipal operations.

Purchase of Energy Star® Equipment
Over the last 3 years, 5 CRT computer monitors have been replaced with Dell flat screen monitors. This action saves 2.8 tons of eCO_2 over the lifetime of these monitors and $965 over the life-span of the equipment according to the Energy Star website.[16]

Compressed Work Schedules
By allowing compressed work schedules, La Conner can reduce the annual vehicle miles traveled in the employee commute sector. Town Administrator Jenny Scott works from home one day a week. While this may not seem like much of a savings measure, not commuting one-day per week over the course of a year saves 1 ton of eCO_2 and $322.00.

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[15] TBC – More Information about the boiler system needs to be obtained from Public Works Director Brian Lease
[16] ENERGY STAR Office Equipment:
http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/Calc_monitors.xls

D. External Measures

In addition to emissions reduction measures implemented within our community, the effects of measures recently implemented at the state and federal level also deserve consideration in the context of our greenhouse gas emissions inventory. They have not been integrated into the projected emissions reductions for La Conner above because they are external to the decision making process of the community. However, actions at other levels warrant consideration, and have thus been outlined below.

In Washington there are several state policies recently passed by the legislature, which are summarized above. These include the renewable fuel standard, SHB 3141, and the "clean cars bill" that adopts California's emissions standards. These will indirectly reduce individual emissions. La Conner residents may not notice these changes in their day-to-day life, but they will have the potential to significantly impact City, and state, greenhouse gas emissions. There are still too many uncertainties about the impacts of these laws to be able to quantify their impact on future emissions in La Conner. However, it is clear that there will be some aid from the State in achieving La Conner's goals.

VI. Proposed Emissions Reduction Measures

After careful consideration of the distribution of emissions production across various sectors of the community, as well as resources available and potential costs and co-benefits, the most beneficial and feasible measures were chosen to reduce greenhouse gas emissions by 20 % in community and municipal operations by 2020.

CACP Software was used to calculate the greenhouse gas reductions both in tons and percentage. However, these measures will not only result in reduced greenhouse gas emissions, but additionally will improve air quality, increase energy efficiency, reduce costs, create more pedestrian friendly and enjoyable communities, and reduce dependency on foreign oil. The measures have been broken down by sector and are described below.

A. Community Measures

The following section of this action plan provides a number of recommended measures that the La Conner Municipal government could help promote among the community to reduce energy consumption, costs, and greenhouse gas emissions. Measures with quantified energy and emissions savings are highlighted in Table.

1. BUILDING ENERGY USE AND MANAGEMENT

A. Increase Residential Green Power Purchasing to 15% of Total Energy Use

Emissions Reductions- If 15% of residential electricity was purchased as green power this would result in a 147 ton reduction in eCO_2.

Implementation Costs – PSE provides a number of ways to purchase green power. A green kWh cost about $0.02 more than a regular kWh and can be bought in bundles of 100kWh. Customers can also pay a monthly $6.00 premium to green 30% of their electricity bill or $10.00 green 50% of energy usage. Total costs for all residents (cumulatively) would be $5,941 at current prices. The cost of green electricity is expected to decrease over time.

- Importance/Context- Renewable sources of energy, such as electricity produced from the wind, the sun, or otherwise landfilled waste products, will be an increasingly important part of the Northwest's energy future. Western Washington University, the City of Bellingham and the Whatcom County government have chosen to purchase 100% green certified electricity for their operations.

  In 2005, 17 % of the housing units serviced by PSE in La Conner (64 out of 363) purchased 6 % of the total electricity consumed by the Town's residences through green power purchases. The residential sector of La Conner could be encouraged to increase purchasing of green energy to at least 15% by 2020. While choosing renewable electricity will incur a small premium at first, it is expected that the price will continue to decrease over time as fossil fuel prices increase and as renewable energy technology improves and is standardized.

- Implementation Scenario- The City could promote the purchase of green electricity among citizens through a "Green Power Challenge" similar to the program Bellingham

has recently begun. This program, sponsored in conjunction with PSE, would entail providing information at City Hall and in quarterly newsletters regarding green electricity purchase as part of La Conner's overall goal to reduce greenhouse gas emissions – and encouraging residents and vendors to advertise their use of green power.

An education program could set the goal of obtaining a community-wide green power purchase rate of 15% by La Conner's residential sectors by 2020. In 2005, 17 % of the housing units serviced by PSE made green power purchases. This means that with no local education or outreach program, a high percentage of residents have already chosen to pay a premium to purchase green power. With a minimal campaign and education outreach effort, a significant increase may be possible. Green power is not much more expensive, and the more people who buy, the lower the cost will become.

- Co-Benefits- Increasing the demand for green electricity in Washington would help protect our air quality, stimulate the regional economy and reduce dependence on foreign fossil fuels.
- Internal Responsibility for Implementation- Administration
- Available Assistance/ Support - Puget Sound Energy's Green Power program is the best resource regarding the purchase of green energy in La Conner.

B. Increase Commercial Green Power Purchasing to 10% of Total Electricity Purchases

Emissions Reductions – If 11% of commercial electricity was purchased as green power this would result in a 425 ton reduction in eCO_2. This level of reduction could be accomplished by having 30% of La Conner businesses purchase 30% of their electricity as green power.

Implementation Costs – A green kWh cost about $0.02 more than a regular kWh. Total costs for each business enrolled in this program would be $358.00 per year – or approximately $29.80 a month. The cost of green electricity is expected to decrease over time.

- Implementation Scenario- The City could promote the purchase of green electricity among businesses also through a "Green Power Challenge" similar to the program Bellingham has recently begun. At the inception of the program, the City of Bellingham was able to exceed its' goals of signing on 50 new businesses to the green power program. As there are currently no participants in this program in La Conner's commercial sector, proportionally large gains will be made for every business that is enrolled in the program.
- Co-Benefits- Increasing the demand for green electricity in Washington would help protect our air quality, stimulate the regional economy and reduce dependence on foreign fossil fuels. Additionally, PSE has an awards recognition program that "certifies" participants in its green power program and provides stickers, plaques and certificates to display. Businesses might find that customers respond favorably to this socially and environmentally responsible measure.
- Internal Responsibility for Implementation- Administration, Chamber of Commerce
- Available Assistance/ Support - Puget Sound Energy's Green Power program is the best resource regarding the purchase of green energy in La Conner. http://www.pse.com/solutions/businessGreenPower.aspx

C. Promote a Community-Wide Energy Efficiency Challenge

Emissions Reductions – This would result in a reduction of 1515 tons eCO_2 per year from efficiencies gained in the residential sector by making building and appliance energy efficiency improvements.

Resource Savings – Residents of La Conner could save 10% on annual heating/cooling costs. Assuming average flat rates for residential and commercial energy and natural gas purchases, the total savings for the entire community adds up to $161,539.

Implementation Costs – Staff time and minimal costs for outreach materials.

- Importance/Context- In the USA the buildings in which we live, work, shop, and educate use about $80 billion dollars worth of electricity and natural gas. In La Conner, electricity and natural gas make up over 70 % of the overall greenhouse gas emissions. The US Environmental Protection Agency, in partnership with business and community leaders, is challenging communities to improve the efficiency of their buildings by 10% or more. Leaders across the country already are showing that energy use in buildings can be reduced by 10-30% with proven practices and technologies that pay off financially and for our environment. The Town of La Conner could call on businesses, institutions, and residents to take the right steps to identify areas where financially attractive improvements can reduce energy use by 10% or more through proven methods such as low-cost building tune-ups, lighting upgrades, and replacement of old equipment.
- Implementation Scenario- The Town of La Conner should utilize their utility bills and any pertinent community newsletters to inform citizens and business owners of the energy efficiency challenge. The city could promote Energy Star® rated products as well as distribute Energy Star materials, which can be obtained free of charge.
- Internal Responsibility for Implementation- Planning Department in conjunction with PSE.
- Available Assistance/ Support – A helpful resource for all issues relating to energy efficiency and the Energy Star Challenge is the Energy Star homepage: http://www.energystar.gov
- Puget Sound Energy also has a lot of energy saving techniques and grant money for businesses and governments regarding energy efficiency upgrades. There are also many small rebates available for individual customers:

  Community - http://www.pse.com/solutions/rebatesOnAllRebates.aspx
  Business - http://www.pse.com/solutions/ForBusinessLanding.aspx

A number of other communities around the region are also considering similar challenges, including Langley. By coordinating efforts with these communities, La Conner would be able to substantially reduce costs associated with program development and implementation.

2. TRANSPORTATION

A. Continue to Promote Mixed Use Zones for a Pedestrian Scale Environment and Encourage Pedestrian and Bicycle Friendly Streets

Emissions Reductions - This would result in an annual reduction of 15 tons eCO2.

Resource Savings - The quantification of this measure assumes that about one fifth of the residents of La Conner (168) would be able to cut out two two-mile trips per week because desirable destinations are within walking or bicycling distance. This could save La Conner residents $3,604 in fuel costs annually.

Implementation Costs – Staff time for outreach and education. Variable costs for re-striping for bicycle lanes, adding bicycle racks in a few downtown locations or improving and or adding sidewalks.

- Importance/Context- Increasingly, many communities are designed in such a way that residents are living farther from places of work, school, and services. This growth pattern fosters an increasing dependence on motor vehicles. This community design, commonly know as sprawl, translates into higher air and global warming pollution associated with higher rates of car travel. Local government, residents and businesses can profit from the development of dense, mixed use neighborhoods. These measures save green spaces and money by cutting fuel, utility and infrastructure, and service delivery costs.

  La Conner's small size and attractive, compact downtown makes it a perfect community for promoting walkability. Furthermore, the Town's emphasis on infill development – where new residences will be built in the existing town core – will further encourage residents to walk downtown.

- Implementation Scenario- The planning commission should continue to encourage the development and re-zoning of areas to allow for mixed uses in of La Conner, as well as encourage the development of bicycle lanes and sidewalks on all streets in the downtown area.

  The Town can work to ensure the safety of its bicycling community. One way to do this is provide more biker- and pedestrian-friendly roads. The city could add more bike lanes in conjunction with road improvements where possible. Additionally, the city could provide adequate bike racks throughout the downtown area and outside City Hall and other public facilities. La Conner should also continue to maintain and expand dedicated bicycle/pedestrian paths to link residential areas with destinations around the Town.

  The city could also encourage walking or biking among children living within 1 mile of the school to walk with their parents and/or in groups with an adult. The "Smart Trip" program has recently been initiated by the Whatcom County Council of Governments which encourages students, parents, and staff to walk to school.

- Co-Benefits – Walkable communities create opportunities for youth and elderly to reach destinations without depending on others for a ride. Creating more options for transportation allows for

- Internal Responsibility for Implementation- La Conner Planning Commission/Department

- Available Assistance/ Support – The Washington-based advocacy group Transportation Choices Coalition assists in the development and implementation of alternative transportation infrastructure. http://www.transportationchoices.org/

___For some really interesting simulations of urban redevelopment projects visit:
http://www.urbanadvantage.com/
http://www.sierraclub.org/sprawl/community/transformations/index.asp

3. OTHER POTENTIAL COMMUNITY MEASURES

To reach La Conner's community goal of reducing greenhouse gas emissions by 20% of 2005 levels the following are some additional suggested measures.

Partner with Community Groups

The Town of La Conner should consider partnering with local community groups to co-sponsor local events which provide information to residents and businesses on how to be more energy efficient and how to reduce personal greenhouse gas emissions. These partnerships will assist La Conner in reaching its reduction targets as well as create a greater sense of community among those involved.

Establish a Community Wide No Idling Educational Effort

Idling vehicles can add unnecessary air pollution to the La Conner community. Excess exhaust can be a potential health concern especially around schools where exhaust from idling buses and parent vehicles can enter buildings through air intakes, doors, and open windows. Idling also wastes fuel and money, up to half a gallon per hour of idling[17]. It is a myth that car engines need to idle more than a few minutes to warm up. Extended idling can cause engine damage due to carbon buildup, potentially reducing fuel economy and oil life. The Northwest Clean Air Agency has begun an educational program focused on preventing idling outside of schools.

Reduce Single Passenger Trips

In addition to municipal efforts, the city could work with the commercial and industrial sectors and encourage them to provide incentives for employees who utilize alternative transportation or carpooling. These programs can consist of many alternatives to commuting as a solo driver, such as organizing and providing funding for carpools, vanpools, the use of transit services, bicycling, and walking. The goals of these types of programs are to alleviate traffic congestion, reduce energy consumption, and curtail vehicle emissions and air pollution to create a healthier workforce and downtown environment.

Encourage Reuse or Recycling of Construction and Demolition Materials

Due to La Conner's large projected growth, the city will see a substantial amount of new construction by the forecast year of 2025. To address the growing problem of wasteful disposal of useable building materials, the Town of La Conner should promote reuse and recycling of materials from new construction and demolition. The ReStore located in the City of Bellingham offers services including pickups, salvage, and whole building deconstruction. This saves homeowners and contractors money on their disposal and labor costs to remove materials and diverts waste from the landfills. They also carry quality building and home improvement materials at prices that are up to 50% off of new items. By diverting construction waste from the landfill this will help La Conner reach its emissions reduction target.

[17] Anti-Idling. 2006. US Environmental Protection Agency. Available Online at: http://epa.gov/cleanschoolbus/antiidling.htm

Table 11. Proposed and Quantified Community Greenhouse Gas Emissions Reduction Measures

Measure	Proposed start year	Tons eCO_2 Reduction by 2020	Cost Savings	Implementation Cost
Green Power				
Increase Residential Purchase to 15% of Total Electricity	2007	147	None	$5,941 cumulative for all participating households (price based on $.02 premium per kWh).
Commercial Purchase 10% of Total Electricity	2007	425	None	$358.00 on average (based on 144 registered businesses) (price based on $.02 premium per kWh).
Energy Efficiency				
Community Energy Efficiency Challenge Residential & Commercial Sectors	2007	1515	10% of Utility Bills ($161,539)	Education and Outreach – Staff Time and Materials
Alternative Transportation				
Increased Bicycling and Pedestrian Activity	2007	15	$3,604 Cumulatively	Education and Outreach – Staff Time and Materials
TOTAL		2102	Variable	Variable

B. Municipal Measures

1. FACILITIES AND APPLIANCE ENERGY MANAGEMENT

A. Purchase 10% of Municipal Electricity as Green Power

Emissions Reductions - This would result in an annual reduction of 40 tons eCO2.

Implementation Costs – At the rate of $.02 per kWh of green power, the Town of La Conner would have to pay $1,524 to green 10% of its electricity purchase.

- Importance/Context- Renewable sources of energy, such as electricity produced from the wind, the sun, or otherwise landfilled waste products, will be an increasingly important part of the Northwest's energy future. One local example of green electricity production near La Conner is the VanderHaak anaerobic digester which is generating enough electricity to power about 180 homes. Western Washington University, Whatcom County and the City of Bellingham have chosen to purchase 100% green certified electricity for their operations.

  The Town of La Conner could consider purchasing at least 10% green electricity by 2020 for its operations. While choosing renewable electricity will incur a small premium at first, it is expected that the cost will decrease over time.

- Implementation Scenario- The city should consult PSE regarding purchase of green electricity.

- Co-Benefits- This creates helps create demand for green electricity which will help reduce the rates for green power. The Town's purchase also sets an important example to the community about the social and environmental value of this program.

- Internal Responsibility for Implementation- Administration, Finance Department

- Available Assistance/ Support - PSE's green power program:

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

- Potential Barriers- The primary barrier is expected to be the cost.

B. Water/Waste Water Treatment Plant Upgrades

- Importance/Context- La Conner's water/waste water treatment plant comprised 55% of energy consumption and greenhouse gas emissions in 2005. La Conner should continue researching opportunities to increase performance and efficiency of this facility. In recent years upgrades such as Variable Speed Drives have been made, and it's possible the largest margins of gain in energy efficiency have already been accomplished. A decrease in energy consumption per gallon of water treated at these facilities would equate to big savings in energy consumption and savings. It is recommended that the w/ww treatment plant begin tracking energy use, a service that could be provided through PSE's energy services. This may help identify the specific operations within the facility that use the most electricity. Puget Sound Energy offers a substantial number of rebates and grants for energy efficiency measures. La Conner should explore opportunities to receive partial funding from PSE to upgrade existing equipment at the wtp/wwtp.

- Implementation Scenario- Research opportunities to improve facility efficiency through Puget Sound Energy or other engineering entity.
- Resource Savings- These have not been quantified at this point but are potentially large.
- Emissions Reductions- Not quantified at this point but potentially large
- Costs - Cost figures are unknown.
- Internal Responsibility for Implementation- Public Works Department and w/ww treatment plant Director Kelly Wynn.
- Available Assistance/ Support - PSE can provide funding up to 50% on energy efficiency related upgrades. The regional contact for project grants is Buzz Busby. e-mail: buzz.busby@pse.com, phone: (360)424-2983

C. Garden Club Water Heater Replacement – TBC

2. TRANSPORTATION

A. 10% Reduction in Employee Commute due to Compressed Schedules or Working From Home

Emissions Reductions - This would result in an annual reduction of 2.67 tons eCO2.

Resource Savings – This measure saves 4 Administrative employees a cumulative savings of $579.

(Both of these figures above do not account for the savings incurred by Jenny Scott, who already works from home one day per week).

- Importance/Context- In an effort to conserve fuel during the commute to work, government employees could be encouraged to work from home one day per week or to work on a compressed workweek schedule. Because of its isolated location, it's not feasible for employees, save two or three, to get to work via means of alternative transportation (bicycling or walking) or public transportation.
- Implementation Scenario- The Administration could review the feasibility of these altered schedules.
- Internal Responsibility for Implementation- City Administration

B. Vehicle Fleet – Purchase of Energy Efficient Vehicles and Biodiesel

Biodiesel (B-20) Fuel Use for Ford 550B

Emissions Reductions - This would result in an annual reduction of .8 tons eCO2.

Resource Savings – Variable. Currently B-20 biodiesel is nominally cheaper at the pump compared with regular diesel ($2.99 for biodiesel at the Rexville Grocery vs. $3.03 for diesel). According to the Department of Energy, the energy content of biodiesel is about 11% less than regular diesel. Therefore La Conner would have to buy approximately 2.2% more fuel.

Implementation Costs – There will be (minimal) costs associated with ensuring that the rubber valves(?) in the fuel injection system are replaced, as these deteriorate with the use of biodiesel.

- Importance/Context- La Conner should consider switching to B20 biodiesel for all of its diesel fuel needs. Biodiesel is a cleaner burning diesel fuel made from natural, renewable sources such as vegetable oils. It can be combined with regular diesel fuel in any percentage—20 percent (B-20) is most common. B-20 can be used in regular diesel engines with no modification. The great advantages of biodiesel are: 1) lower greenhouse gas emissions; 2) significantly lower emissions of carbon monoxide, particulates, sulfur dioxide, and toxics (ten to 20 percent lower with B-20); 3) increased lubricity, resulting in less engine wear; 4) made from renewable resources.
- Implementation Scenario- Consult the City's current fuel providers regarding supply of biodiesel fuels and/or research other local distributors.
- Co-Benefits- Purchasing biodiesel supports biofuels production and agriculture in Washington State, improves local air quality and reduces dependence on foreign oil.
- Internal Responsibility for Implementation- Public Works.
- Potential Barriers- Some car engine warranties have begun to have clauses regarding biodiesel use. The municipality should consult their manufacturer's warranties regarding certain policies.

Purchase Compact/More Efficient Vehicles – Replace Crown Victoria with Compact Car and Replace Chevrolet HD 3500 with Mid-Size Truck

Emissions Reductions - This would result in an annual reduction of 10.26 tons eCO2.

Resource Savings – Assuming the same vehicle miles are traveled in these automobiles, the fuel savings would be $2634. It's also possible to save additional money by downsizing to a car that has higher gas mileage, but has a lower value (e.g. replace the Ford Crown Victoria with a Ford Contour or the Chevrolet HD 3500 with a Chevrolet S10 Pick-up).

- Implementation Scenario- La Conner municipal departments should consider purchasing the most efficient vehicles where appropriate – either for future purchases or to switch out current vehicles. While at this point it's not practical to replace the Crown Victoria, when that vehicle is finally replaced, a more fuel efficient model could be chosen. La Conner should explore opportunities to receive bulk discounts by purchasing vehicles on the Washington State purchasing contracts.

- Internal Responsibility for Implementation- Administration, Public Works, Parks, and Police Departments.

Automobile	Miles Per Gallon	Kelly Blue Book Value (Assuming 60,000 miles)	Gallons Gas per Year - Assuming 4700 Miles Yearly	Total Annual Gas Cost $	Tons Co2
Current: 1993 Crown Victoria	20	3,000	235	599	
Proposed: 1995 Ford Contour (Example)	27	2,685	174	443	
$ Savings		**$325**		**$155**	**1.26 eCO2**

Automobile	Miles Per Gallon	Kelly Blue Book Value (Assuming 60,000 miles)	Gallons Gas per Year - Assuming 29,000 Miles Yearly	Total Annual Gas Cost $	Tons Co2
1994 Chevy HD 3500	14	$9,500	2071	5282	
Proposed: 2000 Chevy S10	25	$6,200	1160	2958	
Savings		**$3,300**		**$2479**	**9 eCO2**

3. LIGHTS

A. Convert Flashing Red (Amber) Traffic Signal (4 Lights) to LEDs

Emissions Reductions - This would result in an annual reduction of 30 tons eCO2.

Resource Savings – PSE currently charges a flat rate for the traffic signal.

Implementation Costs - Red LED lights costs approximately $60-$75 apiece.

Importance/Context- LED bulbs save 80-90% on electricity and have a much longer lifetime. Many cities have already switched over to LED traffic signals and in several years incandescent signals will no longer be available. PSE typically provides up to 50% grant funding for projects that will reduce electricity consumption.

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.

OTHER POTENTIAL MUNICIPAL MEASURES

To reach La Conner's municipal goal of reducing greenhouse gas emissions by 15% of 2000 levels the following are some additional suggested measures.

Photovoltaic Lighting on Facilities

The Town of La Conner manages parks and recreation areas which require lighting. These spaces are used primarily in the spring and summer. Due to the seasonal usage, there is a significant opportunity for installing photovoltaic cells to fuel the lights in the recreational fields. These lights will nearly eliminate emissions, and will also serve as a demonstration of the city's commitment to reduce its impact on the environment and to create a cleaner, healthier La Conner. Typically photovoltaic installations pay for themselves in 7-10 years and last for 30 years.

Only Energy Star® or Equivalent Purchases

The Energy Star® office equipment program was created in 1992 by the DOE and EPA to increase the energy efficiency of common office equipment. Many computers, monitors, copiers, fax machines and other devices on the market are Energy Star®-compliant, and, as the program expands, new products are being added to the list of labeled products, including televisions, VCRs and lighting fixtures. Priced comparably with conventional office equipment, Energy Star®-labeled equipment can save as much as 50-75 % of total electricity use in an office, depending on the type of device and usage patterns. Because of these substantial projected savings in electricity costs, all new office appliances should be purchased with an Energy Star® or equivalent rating. It is important to note that in order to be effective, Energy Star® products must have the specific energy efficient features active. The procurement policy should ensure that there are adequate and well-placed small appliances, such as microwave ovens, coffee pots, and refrigerators, to meet the needs of city employees. More information regarding energy star products and energy savings can be found at:
http://www.energystar.gov

No Idling Policy for Municipal Fleet

Idling vehicles can add unnecessary air pollution to La Conner's air. Excessive idling also wastes fuel and money, up to half a gallon per hour of idling[18]. It is a myth that car engines need to idle more than a few minutes to warm up. Extended idling can cause engine damage due to carbon buildup, potentially reducing fuel economy and oil life[7]. The municipality should establish a policy that prohibits unnecessary idling of fleet vehicles.

[18] Anti-Idling. 2006. US Environmental Protection Agency. Available Online at: http://epa.gov/cleanschoolbus/antiidling.htm

Table 12. Proposed and Quantified Community Greenhouse Gas Emissions Reduction Measures

Measure	Proposed start year	Tons eCO_2 Reduction by 2020	Cost Savings	Implementation Cost
Facilities and Appliances				
Increase Municipal Purchase of Green Power to 10 % of Total Electricity	2007	40	None	$1,541 (price based on $.02 premium per kWh).
WW/W Treatment Plant Upgrades	2007	TBC	TBC	TBC
Installation of On Demand Hot Water Heater in Garden Club	2007	TBC	TBC	TBC
Transportation				
Compressed Work Week	2007	2.67	$579	None
Biodiesel in Ford 550	2007	.8	Variable	Variable
Efficient Vehicle Purchase/Switch	2007	10.26	$2634	None
Lighting				
Traffic Signal – LED Replacement	2007	30	TBC	TBC
TOTAL		83.76	$ 3213	Variable

Table 13: Emissions and Target Summary

	Community Analysis	Municipal Operations Analysis
Base Year	**2005**	**2005**
eCO_2 Emissions (tons)	15,435	520
Target Year Forecast		
eCO_2 Emissions (tons)	25,085	580
Proposed Reduction Target		
Percent eCO_2 reduction	20%	20%
Reductions Necessary to Reach Target		
eCO_2 Emissions (tons)	12737	164
Proposed Measures	2102	83.76
% of Target Achieved by Proposed Measures	**16%**	**50%**

VII. Conclusion

Climate change is an issue of growing concern for communities across the United States and around the world. La Conner has displayed great leadership and foresight in choosing to confront this issue now. By reducing the amount of greenhouse gases emitted by its community, La Conner joins hundreds of other American cities in stemming the tide of global warming 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, La Conner 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 global warming 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 more livable community.

Meeting La Conner's reduction target will require both persistence and adaptability. Therefore the very next step in this process should be to work with the Northwest Clean Air Agency to fund a regional Resource Conservation Manager position, to ensure that the existing forward momentum is maintained and enhanced. This person can promote the measures already in progress and being implementation of those that have yet to begin.

VIII. Guide for Future Steps

A. Administration and Staffing

A key part of effective measures implementation is assigning and defining management responsibilities for the individual components. An appropriate staff person within the Town should be assigned overall responsibility for coordinating the implementation of the Climate Action Plan.

It may make sense for the Town 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 and implement the goals of the Climate Action Plan. 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 Town actions, and to recommend and coordinate actions in the private sector.

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

B. Financing and Budgeting

Many opportunities will arise to incorporate measures into existing projects and expenditures, from right-sizing the municipal fleet to incorporating policies that encourage and enable transit in lieu of single occupancy vehicles. Some actions, such as adding more buses or routes to expand transit use, may require significant up-front investment, whereas some, such as reducing number of vehicles in the municipal fleet or 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 the Climate Action Plan's programs and measures should be timely enough to get La Conner to its goal by the target year. However, it should also be practical, taking into account the administrative, political, technical, and other issues involved in getting programs up and running.

The overall schedule should meet the target date 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 Town 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 the Climate Action Plan is implemented effectively and on schedule, it is important to include procedures for monitoring its implementation, measuring results, keeping track of changing conditions, taking advantage of new information and ideas, and so on. Measuring results is important. This requires following up on the sources and data developed in preparing the emissions analysis and forecast. 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 La Conner is making.

Climate Action Plan can become incorporated into the larger municipal and community operations is by including the proposed recommendations in county-wide planning documents. .

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 - Data Collection Process, Assumptions and Notes

All of the detailed assumptions made about data are detailed in the spreadsheet "Data Summary." Below is a brief description of the data sources and assumptions.

Government Inventory:

Buildings: Data for all municipal electricity accounts were gathered from utility bills from 2005 from the Town of La Conner.

Vehicles: Debbie Malarchick provided the fleet inventory and fuel records. Brian Lease provided information about vehicle VMT. Gallons of fuel were determined from the city's fuel purchases.

Employee Commute: Based on a survey with a 100% response rate.

Streetlights: Electricity usage was determined based on the wattage method in conjunction with the assumption that streetlights were on for an average of 11 hours per day.

Water/ Sewage: Data for all water and sewage electricity use were gathered from utility bills from PSE.

Waste: Government waste was determined by billing records from the tipping fees at the Skagit County Transfer Station. Kelly Wynn and Brian Lease provided information about the break down of waste (how much was from the ww/w treatment plant and how much from government operations. The methane recovery factor of 80% was applied, as all Skagit County waste is deposed at the Roosevelt Landfill.

Community Inventory:

Residential, Commercial & Industrial:

Electricity:

All electricity figures for the residential and commercial sectors in were reported to us by PSE.

Transportation:

La Conner annual vehicle mileage was based on traffic counts by the Skagit County Council of Governments, vehicle registrations and street length data. Mark Sullivan of SKOG used these factors to model (program?) the daily VMT. The same data was input into the CACPs software to arrive at a daily VMT number. These figures were adjusted to account for higher travel from April to October, due to tourism.

Waste:

Community waste for La Conner was estimated based on County rates for waste generation and recycling and per capita waste averages from Anacortes and Bellingham.

Recycling:

Recycling data was based on Skagit County's Comprehensive Waste Management Plan.
http://www.skagitcounty.net/PublicWorksSolidWaste/Documents/CSWMPFinal.pdf