Edmonds Community College

Preliminary Green House Gas Emissions Inventory

Phase I

(2005 – 2008)

January 2009

FINAL

NextGen TODAY

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EXECUTIVE SUMMARY

Edmonds Community College in Lynnwood, Washington (EdCC) is undertaking a preliminary greenhouse gas inventory as part of its commitment to the American College and University Presidents' Climate Commitment (ACUPCC).

The purpose of this report is to provide a view into EdCCs' current green house gas (GHG) emissions, use historic emissions data to project future trends, and to build a collection method and set of tools to gather ongoing emissions data. The report and supporting data will also be a useful tool for students working on campus sustainability and could serve as the basis for curriculum development around greenhouse gases, inventories, and managing sustainability initiatives.

This preliminary greenhouse gas inventory focuses on direct and indirect emissions (where data is available) arising from campus operations for the fiscal years from 2000 to 2008 utilizing the Clean Air Cool Planet GHG calculator Version 5.0, focusing on direct and indirect emissions, excluding transportation. The final baseline for FY 2008 – 2009 will shift the data set to Version 6.0 of the calculator and will include transportation estimates to establish a final GHG base-line and methodology for going forward.

The findings from the preliminary inventory and the follow-on inventory that will include FY 2008-2009 inventory will be submitted publicly to the ACUPCC on or before August 15, 2009.

Summary of GHG Highlights

This preliminary inventory serves as an initial estimate of greenhouse gas emissions for Scope 1 (direct emissions from on-site production), scope 2 (indirect emissions from electricity production) and partial Scope 3 emissions (indirect emissions from other activities) for the fiscal years running from July 2005 – June 2008, where that data is available or could be derived.

- The analysis shows that Edmonds Community College was responsible for a total of 24,208 metric tons of CO2e (MTCDE) from reported sources during fiscal year 2007-2008 from its use of natural gas, electricity, propane, fertilizers, and solid waste. These consumption-based emissions are offset slightly by a modest amount of composting.
- The actual MTCDE will be much larger when direct emissions from campus vehicles and indirect emissions from student and faculty commute and air travel are included in FY 2008-09
- The **Scope 1 sources** contribute the largest proportion of the net emissions at **20,754 metric tons** of CO2 equivalents. This is followed by the **Scope 2 sources** at 3**,222 metric tons**, and **Scope 3 sources** at **231 metric tons**.
- 2006-2007 saw a decrease over the previous year in net emissions while the campus population and square footage increased slightly by 3000 square feet.
- 2007-2008 saw an increase in leased square footage of 46,000 square feet.

Most of the Scope 1 emissions as reported right now (in absence of calculations for direct use of vehicle fuel) comes from natural gas consumption, with only a minor amount coming from fugitive emissions from HVAC and chemical sources. Scope 2 emissions from electricity are a much lower portion of the whole, in part because of the use of hydro-based power sources by the regional utilities. Currently, scope 3 emissions calculations only include waste figures, and so are a much lower part of the whole than they will be when commuting travel is included. Most campuses who have included staff and faculty travel are finding that this category as a subset of Scope 3 ends up representing the greatest impacts on their carbon footprint. It is likely that the FY 2009 -10 baseline that includes the travel survey will reveal the same.

Potential for Green House Gas Emission Reduction

The campus has already implemented several sustainability initiatives through the course of 2008 – 2009 that will begin to have an impact on the emissions profile, and **Appendix A: Example of Potential Actions in a Sustainability Plan** on page 23 in this document outlines several additional opportunities.

Reducing scope 1 direct emissions means tackling natural gas use through initiatives around more efficient systems and operation of the heating facilities, installing alternative district heating sources such as solar or geothermal, or other measures. It also involves greening the fleet through conservation driving behaviors, better maintenance and equipment management, and selecting vehicles that are more climate-friendly.

Reducing scope 2 electrical consumption emissions involves decreasing demand for lights and equipment with initiatives to retrofit with higher efficiency systems and campaigns to increase campus conservation. The emissions factors could also decrease through encouraging the utility to use more renewable alternative power sources and/or installing renewable power sources on-campus.

Reducing Scope 3 emissions involves reducing emissions from waste reduction initiatives, selecting waste landfills that recover emissions or generate energy. Primarily, though, it means reducing commutes, shifting commutes to cleaner choices, and addressing air travel through off-sets.

For each of these initiatives, the cost effectiveness and emissions returns would need evaluation to determine which set would represent the best options.

Overview of Project and Next Steps

There are several activities that will follow to build a foundation for inventories going forward and the sustainability plan:

Update the Calculator and Adjust Base Year Data. For the FY 2008 – 2009, the Clean-Air/Cool Earth calculator issued a version 6 of that tool that added several categories of new information to be included. All of the Version 5.0 calculator data will also be converted to Version 6.0. A collection strategy for developing a more complete analysis of all scopes is included in this report.

Establish the Foundation for Future Collection. The FY 2008 – 2009 collection and reporting effort will be used as an opportunity to train the individuals who will be continuing on to help monitor GHG emissions on campus. NextGen will continue to verify the historic data and support the Sustainability Council in its efforts to complete the data collection for 2008 – 2009, including implementing a commuter survey to capture scope 3 emissions. A strategy for building the annual Green House Gas inventory into the campus curriculum is outlined.

Collect Missing Data & Backfill Previous Data. For the FY 2008 – 2009, it is recommended that the Sustainability Council sample a set of students and faculty and secure information on travel and commuting. Once this data is received, it will be easier to extrapolate and derive estimates of previous years emissions in these categories.

Develop a Sustainability Plan to Reduce Emissions and Increase Performance. As part of the President's Climate Commitment, the campus needs to build a sustainability plan that includes goals for reduction and specific initiatives.

A follow-on meeting on campus will be used to cover the greenhouse gas inventory, potential goals, and the development of an ongoing approach to monitor and evaluate emission performance. This will include a discussion about incorporating climate instruction and GHG inventories into the campus curriculum. The next steps are summarized in Table 1 below.

Table 1: Review of Project To Date & Next Steps

ACTIVITY	STATUS & TIMING	LEAD ORGANIZATION
Choose Calculator and Inventory Protocols	Complete	NextGen
Initial Data Collection & Preliminary Report Generation	Complete	NextGen
Verify Data Sets	May 2009	NextGen
Conduct on-campus meeting with sustainability group to review inventory	May 2009	NextGen
Issue Transportation Survey	May 2009	Sustainability Council with NextGen Support
Establish protocol to secure scope 3 emissions and complete inventory for 2008-2009 year	May 2009	Sustainability Council with NextGen Support
Develop sustainability plan and long-term strategy to reduce emissions	June 2009	Sustainability Council with NextGen Support
Make inventory available to students and faculty online	July 2009	Sustainability Council
Develop plan to integrate sustainability into curriculum	August 2009	Sustainability Council
Submit Climate Action Plan to ACUPCC	By 8/15/09	Sustainability Council

The following report provides detailed information about these findings and the data and analysis methods used to conduct the inventory.

EDMONDS COMMUNITY COLLEGE AND SUSTAINABILITY

Edmonds Community College is located in Lynnwood, Washington. Currently, more than 11,000 students take courses for credit toward a certificate or degree over the course of a year, with 43% of the students planning to transfer to a four-year college or university and more than 31% working toward career program degrees. More than 62 % of students in credit courses are part-time students who combine college with work and with family.

This preliminary inventory is part of a broader commitment that Edmonds Community College has made to sustainability. EdCC joins other schools in the region who are examining their campus sustainability practices, and emissions profiles. Beyond campuses, Washington as a state has made a broader commitment to energy and resources conservation, climate and environmental performance, and green jobs.

Presidents Climate Commitment

Edmonds community College signed the Presidents Climate Commitment of the American Council of University Presidents, joining other Colleges and Universities throughout the United States to work together in reducing greenhouse gas emissions 80% by mid-century.

Signatories of the Presidents Climate Commitment are required to take three actions within the first few years of signing, with an eventual requirement of achieving carbon neutrality:

1. Develop a committee or other body to develop and oversee the implementation process within two months.
2. Complete a greenhouse gas inventory within a year
3. Develop a strategy and target date to attain carbon neutrality and have successfully completed two tangible actions mandated by the ACUPCC within two years.

Once the plan is developed, the plan, inventory and progress reports must be made publicly available. These plans identify a time period to achieve climate neutrality, and outline the structures they will create to guide their plan, complete an inventory of emissions, (including transportation, buildings, electricity, waste, etc.,) and develop an action plan. These actions plans need to include a date for achieving climate neutrality, actions to make climate neutrality and sustainability part of the schools curriculum and educational experience, expand research efforts, and design a way to track progress on goals and actions.

Ultimately the schools are working to integrate curriculum into their schools and teach students how to better sustain a healthier environment. This commitment will bring together communities and help educate students by the time they are graduates to help reduce emissions of global warming. The colleges and universities that signed this commitment will help their students face challenges and help them make economical decisions in the future.

To date, EdCC has already established a Sustainability Council, made up of several departments across campus who are interested in and impacted by the schools commitment to the Climate Commitment. A Sustainability Assessment was conducted by an in-house time led by a Horticulture faculty and his two students. Using the good company framework, they examined current practices on the campus and identified areas for improvement.

This inventory is the next step in the effort. The goals for the preliminary and follow-up GHG inventory include

- Fulfill requirements of the President's Climate Commitment
- Estimate current and past GHG emissions with available and derived data
- Identify trends and establishing a baseline
- Build tools that can be used to complete the inventory and integrate its ongoing update into subsequent curriculum
- Use the information to develop strategies and policies
- Assess progress in those plans in subsequent inventories

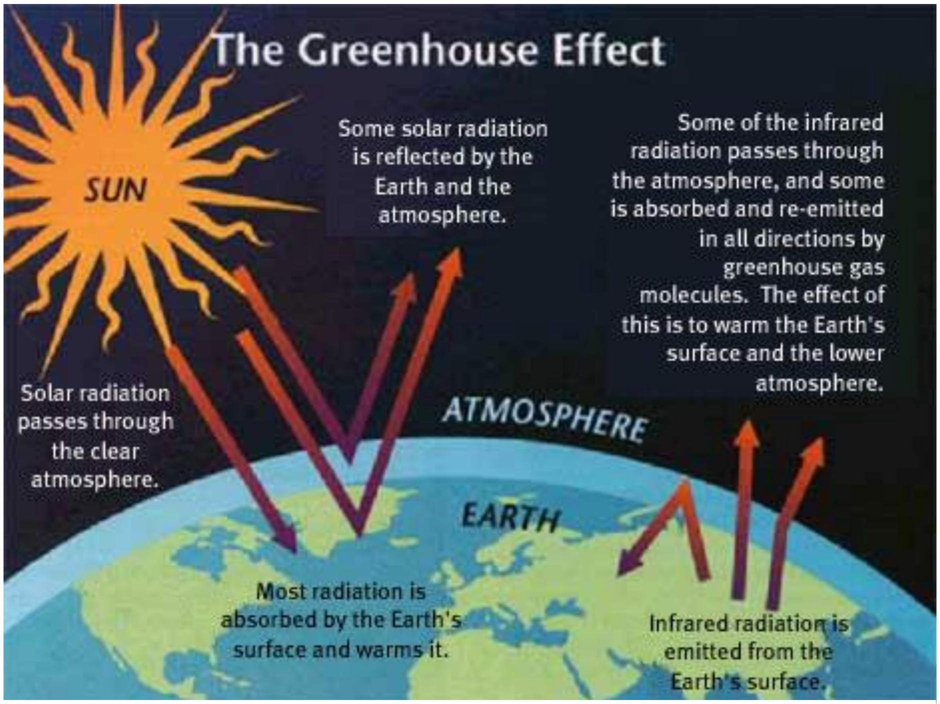
To accomplish these goals, this inventory is written in part as a tutorial overview of green house gas concepts and methodologies. The report also includes the basis of information necessary to complete the 2008 – 2009 fiscal year.

GREEN HOUSE GAS OVERVIEW

Chemical compounds in the atmosphere called Green House Gases (GHG) trap heat on the earth and contribute to the greenhouse effect.

There are several naturally occurring gases (known as direct greenhouse gases), including water vapor, carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and ozone (O3). Human activities have changed their atmospheric concentrations above those that might occur naturally. The Environmental Protection Agency reports that concentrations of these greenhouse gases have increased globally over the last 250 years from human activities, with CO2, CH4, and N2O rising 36, 148, and 18 percent respectively (IPCC 2007). There are also several classes of halogenated substances that contain fluorine (hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF6)), chlorine (chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs)), or bromine (bromofluorocarbons (i.e., halons)).

Figure 1: Understanding the Greenhouse Effect



Source: Environmental Protection Agency

As illustrated in the figure from the Environmental Protection Agency, some of these gases absorb radiation, and therefore contribute directly to the greenhouse effect. In other cases, chemical transformations of a particular gas can produce other greenhouse gases or extend the atmospheric lifetimes of other gases. Still other gases affect atmospheric processes (like cloud formation) and can thereby alter the radiative balance of the earth.

Some gases indirectly affect terrestrial and/or solar radiation absorption by influencing the formation or destruction of greenhouse gases, including tropospheric and stratospheric ozone. These gases include carbon monoxide (CO), oxides of nitrogen (NOx), and non-CH4 volatile organic compounds (NMVOCs). Aerosols, which are extremely small particles or liquid droplets, such as those produced by sulfur dioxide (SO2) or elemental carbon emissions, can also affect the absorptive characteristics of the atmosphere.

But attention to the issue can make a difference. For instance, beginning in the 1950s, the use of CFCs, HCFCs, halons and other stratospheric ozone depleting substances (ODS) increased by nearly 10 percent per year until the mid-1980s, when international concern about ozone depletion led to the entry into force of the Montreal Protocol. Since then, the production of ODS is being phased out. In recent years, use of ODS substitutes such as HFCs and PFCs has grown as they begin to be phased in as replacements. While these fluorine halogenated substances do not deplete the ozone, they are still powerful greenhouse gases. Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes.

GHG all have varying degrees of severity. To global warming potential of each gas is a measure of the gases radiative forcing—the greater the radiative forcing the more potent the gas. To make easier comparisons, most GHG inventory tools will translated all gases into equivalent units of carbon dioxide (CO_2), otherwise known as eCO_2 (see Table 2) . So carbon dioxide has a value of 1, and single units of other gases like methane have a radiative force 23 times that of CO_2. Some gases like the HFCs and SF6s are often emitted in smaller quantities than methane or carbon, but because they are potent greenhouse gases thousands of times more powerful than a single CO_2 unit, they are sometimes referred to by global climate organizations as "High Global Warming Potential gases."

Table 2: Global Warming Potential of Specific Gases

Gas	Units Equivalent of C02
Carbon Dioxide (CO_2)	1
Methane (CH_4)	21
Nitrous Oxide (N_2O)	310
HFC-134a	1,300
Sulfur Hexafluoride (SF_6)	23,900

GHG Inventory Methodology

A greenhouse gas inventory focuses on an organization or geographic area over specific time period and assesses the amount of greenhouse gases emitted to or removed from the atmosphere. The focus for the GHG inventory is on the six regulated GHGs: CO_2, CH_4, N_2O, HFC, PFC and SF_6. Each of these is described briefly in the table below, along with some example sources from EdCC operations.

Table 3: Regulated Greenhouse Gases

Gas	Description	Example Source from EdCC Operations
Carbon Dioxide (CO_2)	A colorless, odorless gas that is the most prominent Greenhouse gas. It is formed during respiration, combustion of fossil fuels (oil, natural gas, and coal), and organic decomposition (solid waste, trees and wood products) and used in food refrigeration. Carbon dioxide can also result from other chemical reactions (e.g., manufacture of cement).	▪ Natural gas boilers ▪ electricity consumption ▪ oil consumption
Methane (CH_4)	A colorless, odorless flammable gas that is the major constituent of natural gas and is emitted during the production and transport of coal, natural gas and oil. Methane can also itself be another source of fuel and is an important source of Hydrogen. Livestock, other agricultural practices, and the decay of organic waste in municipal solid waste landfills can also result in methane emissions.	▪ Natural gas boilers ▪ electricity consumption ▪ oil consumption ▪ landfilling solid waste

Table 3: Regulated Greenhouse Gases

GAS	DESCRIPTION	EXAMPLE SOURCE FROM EDCC OPERATIONS
Nitrous Oxide (N2O)	Occurs naturally in the atmosphere, and can also result from agriculture and industrial activites and combustion of fossil fuels and solid waste. It is also used as a mild anesthetic.	▪ Natural gas boilers ▪ electricity consumption ▪ oil consumption ▪ fertilizer on campus lawns
Hydrofluoro-carbons (HFCs)	A fluorocarbon emitted as a by-product of industrial manufacturing. Also, a halocarbon in which some hydrogen atoms have been replaced by fluorine and it is used in refrigerators and aerosols.	▪ refrigerant gases
Perfluoro-carbons (PFCs)	A compound consisting of carbon and fluorine. A compound in which all the hydrogen atoms of a hydrocarbon are replaced with fluorine atoms	▪ refrigerant gases
Sulphur Hexafluoride (SF6)	A colorless gas that is soluble in alcohol and ether. It is a powerful greenhouse gas widely used in the electrical utility industry.	▪ refrigerant gases

The inventory can be used to better understand the activities that cause emissions and removals, and so can inform strategies and help track impacts from actions taken.

To build the inventory protocol, several key decisions needed to be made:

1. Selecting a GHG Protocol and tools
2. Scoping the preliminary and follow-on inventories
3. Choosing organization boundaries
4. Establishing base and trend years
5. Determining data collection strategy
6. Identifying data limitations and strategies for future

In a typical GHG inventory, these decisions inform the analysis but may not be a specific focus in the report, which may instead focuses mostly on results. In this case, however, we have taken more care to systematically lay out the methods and approach uses to provide the Sustainability Council with the information necessary to carry forward this effort.

1. GHG Protocol--Cool Air, Clean Planet Calculator

The Clean Air-Cool Planet calculator (CACPC) was chosen for this project because it satisfied several important criteria:

- The calculator is recommended by the ACUPCC, and therefore meets their requirements for collection and emission factor calculations that are in compliant with World

Resources Institute (WRI) Greenhouse Gas Protocol and IPCC guidelines (See Appendix B for more illustration of the conversion factors).

- The calculator is widely used across campuses and to date, it has been implemented in more than 1200 campuses across the country in schools of all sizes, which creates the opportunity for benchmarking and best practice sharing.
- The calculator comes with factor conversions already incorporated, yet still has enough sophistication to accommodate more developed approaches that the college may want to pursue over time.
- The calculator continues to be updated through a collaboration among several universities and other organizations, and therefore will likely adjust with the times.

In sum, the calculator is a clear asset for campuses. However, it is not without its challenges, and the same innovation that will keep the calculator relevant also can create some data collection and standardization challenges. Even in the case of this inventory, the shift from Version 5.0 to Version 6.0 of the calculator creates some decisions about how current and historical data will be interpreted.

2. Preliminary Inventory—Determining the Scope of Emissions

The Campus Carbon Calculator (CCC) divides greenhouse gas emissions into three scopes:

- **Scope 1**--EdCC's direct GHG emissions from on-site energy production, mobile combustion, other industrial activities and fugitive emissions from HFC leakage or CH4 from farm animals
- **Scope 2**--Energy that is purchased from off-site—electricity, steam, etc.
- **Scope 3**--Broader GHG impacts from operations, including employee and student travel, off-campus waste disposal, upstream emissions from products purchases and downstream emissions from transporting and disposing products used/sold by the firm

The ACUPCC signatory institutions are responsible for inventorying scope 1 and 2 emissions, along with commuter and air travel and waste disposal within scope 3. Preliminary, retrospective GHG Inventories rarely include all data sources, in part because that data was typically not gathered previously in the organization. Many of the GHG Inventories found among the President's Climate Commitment resources do not include travel, for instance, or perhaps have other categories where data was not consistently available. From these preliminary inventories, organizations then work to improve their data collection and availability, and in some cases may even move to build additional assumptions and derivations to "back fill" missing data.

As for EdCC's preliminary inventory, the various types of data in each scope is outlined below[1], along with a summary of the EdCC situation around that data. It is also noted whether or not the data is included in the current analysis, and the intentions for the FY 2008-2009 assessment.

[1] IMPORTANT TO NOTE: This is based on Clean Air/Cool Planet Version 5.0, Additional Categories are added to Version 6.0

Table 4: Data Types by Emission Scope Included in GHG Inventory

SCOPE	CATEGORY	EDCC SITUATION	2005-08	2008-09
Scope 1	Stationary Power Sources	The campus has several standby generators that consume either propane or natural gas. These are run infrequently, either from 1) a short monthly test, 2) power during construction, 3) back-up power for power outages, primarily from storms.	Included, some estimates necessary for propane	Will be included, with additional efficiencies information
	On-Site Heating, Cooling, Cooking, Laboratories, Etc.	The campus has a natural gas space heating, chiller plant, boilers, science labs, culinary programs, greenhouse, and other related applications.	Included	Will be included
	Mobile Sources	The campus uses both gas (combustion) automobiles, along with electric golf carts. Separate vehicle fleets are used and maintained by difference groups: security, landscaping maintenance, and facilities.	Incomplete historical data found to date	Will be included, based from expenditure data
	Refrigeration/AC Use	Several systems on campus leverage some form of HVAC or other situations where "fugitive" emissions may occur, although many of the buildings are served by a centralized chiller/boiler plant. Units are serviced by a third party vendor, who provides the refrigerants.	Included	Will be included
	Indirect Electricity/Steam Purchases	Electricity serves buildings on campus for lighting, heating, HVAC, power and other functions. No steam is purchased	Included	Will be included
	Fertilizer	Synthetic and organic fertilizer used on lawns, in horticulture, etc.	No data provided to several requests	Will be included
	Agriculture & Livestock	No livestock on campus	n/a	n/a
Scope 2	Electricity Purchases	Electricity is used for lighting, power, heating, cooling and some electric transport. All electricity is purchased through Snohomish County PUD.	Included using standard grid mix	Will be included using SnoPUD's calculated mix
Scope 3	Student Travel	The student body includes students from 68 other countries, but nearly 90 percent of students live within eight miles of the campus.	No data available	Will be included (assumes survey)
	Faculty Travel	Travel costs are currently 1% of the overall expenditure budget		
	Waste	A number of tons go directly to the landfill, and the campus also recycles and composts	Included	Will be included
	Off-Sets	The campus currently composts	Included	Will be Included

3. Organizational Boundary—Operational Control

Establishing a consistent organizational boundary for a Greenhouse Gas Inventory is key. Organizations must choose either an 1) equity share (based on ownership) or 2) control approach (based controlling either financial or operational decisions) to establish an organizational boundary. For the EdCC inventory, we used the Control approach—more specifically the operating control approach. Under this approach, EdCC takes on 100 percent of GHG emissions from operations over which it has control. It does not account for GHG emissions from operations in which it owns an interest but has no operating control.

The implications of these boundary choices for basic operations and various "grey areas" are outlined below:

Table 5: Operational Control Implications on Inventory Scope

Category	Description	GHG Implications from Operational Control Boundary
Owned Facilties and Vehicles	EdCC has a number of buildings and fleet that institution owns.	Included in all cases where EdCC also has operational control over how buildings are operated
Leased Facilities and Vehicles	EdCC has several buildings and partial buildings that are leased, not owned.	Included, leased assets that fall within EdCCs organizational boundary are classified as Scope 1 or 2 as appropriate, those that do not fall within a company's organizational boundary should are Scope 3.
Golf Course	EdCC is partial owner of a municipal golf course with the City of Lynnwood, but does not make any of the operating or financial decisions.	Not included
Headstart Initiative	EdCC conducts headstart classes in various locations around the region beyond the campus.	Should be included, but data was not available at he time of the inventory. Will be calculated separately
Correctional Facilities Support	EdCC provides staff to aid with correctional facilities.	Not included, and affected employees would not be included in any employee counts

4. Base Year Issues

The first choice to be made was whether to frame the inventory in terms of calendar year or fiscal year. Fiscal year was chosen to align with the decisions that are made that could impact further green house gases—primarily operating and capital budgets.

Trend years data for the fiscal years 2005 – 2006, 2006-07 was also sought where data was available. Data was also collected from July 1, 2008 through the current date to facilitate the collection and reporting of the GHG levels for the next fiscal year.

There are a two main reasons one might adjust base year emissions:

- **Structural changes**, including the acquisition of operations or facilities which existed prior to the company base year, the divestiture of operations or facilities, or a normalization factor for goal-tracking
- **Methodology changes**[2], including significant change in emission factors, constants, or methodologies; or where errors are discovered in previously submitted data.

In EdCC's case, there is the potential for both of these issues are impacting the use of the current preliminary inventory results.

Several Structural Changes. A number of construction projects have changed the square footage and underlying operations of the college from the FY 2007-08 baseline. It is unclear at this point whether the changes are significant enough to impact the baselines—this will become more clear when the FY 2008-09 collection and calculations is complete.

Calculator Methodology Changes. Clean Air Cool Planet has issued a version 6.0 of the calculator. Along with some modest changes to scope 1 categories, this version has additional categories of collection in Scope 3 emissions, including waste water, paper use, and more. The FY 2008-09 collection will use Version 6. When the 2008 – 2009 collection is completed, a decision will need to be made about whether to attempt to gather or derive the additional categories of information retroactively for previous years.

5. Data Sources and Collection Strategies for FY 2005 - 2008

To complete the calculator, we gathered data from various sources, outline below. Collecting this data required several approaches:

- Interviews--Phone and in-person meetings with facilities personnel
- Site visit—on campus review of major facilties
- Vendor outreach--Data requests from utilities and review of utility bills, Interviews with vendors

Data was sought on the following areas:

Table 6: Summary of Data Collection Categories for Preliminary Inventory

Scope 1 & 2 Data	Data Type	Source	Notes for Collection in FY 08-09
Electricity Purchases 07 - 09	Bi-monthly purchase record by meter in KWh	Snohomish County PUD PowerTrends tool	Retrospective required special project in utility. Data is only kept in Power trends for 12 months
Natural Gas Purchases 05 – Current	Monthly purchase records by meter in Therms	Puget Sound Energy Account Executive	15 new meters added in 2008-09, data requires account request
Refrigerants	Purchase in pounds, part of annual service plan through third	Pac Air Account Executive	Need to establish regular tracking and reporting from vendor into data collection

[2] Methodology changes are included if they represent greater than 5% difference in total base year emissions

Table 6: Summary of Data Collection Categories for Preliminary Inventory

Scope 1 & 2 Data	Data Type	Source	Notes for Collection in FY 08-09
	party		
Propane	Purchase in Gallons through third party		Conversion of propane generators to natural gas for FY 2008-09
Campus Waste	Short Tons	Allied Waste Services	Additional food composting implemented in 2008
Gasoline Fuel Purchases	Gallons	Estimates for Prelim, soliciting	Needs to be resolved for 2008-09

6. Data Limitations for Base Years to Be Addressed in FY 2008-2009

All data for all required reporting categories was obtained for FY 2007-2008, with the exception of direct fleet fuel consumption, which will need to be addressed during the FY 2008-09 collection and will need to be derived for previous years. The information reported to ACUPCC will need to include this information. The general lack of information across key categories will provide a limited comparison across years. More importantly, though, these issues need to be addressed to build a strong inventory system going forward.

Vehicle Fuel Consumed. Vehicles are used by a wide variety of departments on campus. Unfortunately, there does not appear to be a central location where gasoline purchases in gallons are tracked, which made it difficult to assess direct emissions related to on-site fleet. In finalizing collection for FY 2008 – 2009, additional investigation will be done to determine if estimates can be made from the assets themselves, from gas cards, from a centralized gas account, or from statistics provided to the State of Washington. It would also be good to include a full list of vehicles on campus.

Monthly Steam Output and Boiler Operation Time. Information about steam output should be included in the Scope 1 emissions calculations. While information about capacity and efficiency factors could be surmised from the equipment types, we weren't able to find information about actual utilization and outputs, either from the college itself or from the contractors working in parallel on the energy efficiency audit. This information should be captured, both for the greenhouse gas inventory as well as for the useful insights it would bring to increasing operational efficiencies.

Electricity for FY 1999-2000 to Current. Data on meters for the campus was available online for 24 months, but not available in hardcopy or easily through the utility. Data back through 2005 was provided, and further requests to get data back to 2000 have been submitted. If/when data is secured, a FY 1999 – 2000 baseline that captures gas and electricity usage can be added to the overall inventory.

Student and Faculty Travel. One of the biggest challenges typically faced by campuses is data collection for air travel and commuting. In some cases, such information is derived. A survey is included in Appendix E that could be issued each year to collect for future inventories.

Other Broader Transportation Emissions. Construction and renovation projects, purchased materials and supplies.

GREENHOUSE GAS INVENTORY INPUTS

Greenhouse gas is generally estimated in CO^2 equivalent units. To determine the metric tonnes of carbon dioxide equivalent for a particular energy source or activity that emits greenhouse gases, we collect information on the amount of activity or quanitify of energy that was used, in either kWh, MMBtu's, Gallons, Pounds, or whatever unit is appropriate. Appendix B shows all of the potential inputs and their unit for Version 5.0 of the calculator. Then the calculator brings together information about 1) the greenhouse gas emitted from each activity or energy source (see Table 3 for examples), 2) the average rate of emissions for a particular gas from a particular source, and 3) the global warming potential for each different greenhouse gas to create an emission coefficient for each category.

Table 7-Table 10 outline the more significant inputs we leveraged to build the preliminary Green House Gas Inventory, including information about buildings on campus, gas and electric purchases, and waste practices.

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Table 7: Buildings on Campus with Square Footage for Fiscal Years 2005 – 2008

Building Name	Date Built	Floors	Major Reno complete	Inc	Address	05-06	06-07	07-08
North Duplex	9/1/30	2			20010 – 68th Ave. W	3,989	3,989	3,989
South Duplex	9/1/30	2			20014 – 68th Ave. W	3,989	3,989	3,989
Mountlake Terrace Hall	9/1/70	2	6/19/2006	2,801	20124 – 68th Ave. W	57,600	60,401	60,401
Lynwood Hall	9/1/72	5			20212 – 68th Ave. W	90,960	90,960	90,960
Util. Bldg (Boiler Room)	1/1/73	1	12/5/2004	2,032	20020 – 68th Ave. W	6,932	6,932	6,932
Woodway Hall	9/1/76	2			20120 – 68th Ave. W	20,120	20,120	20,120
Brier Hall	1/1/77	2			20122 – 68th Ave. W	51,767	51,767	51,767
Seaview Gymnasium	1/1/77	1 1/2			19906 – 68th Ave. W	30,100	30,100	30,100
Meadowdale Hall	4/1/78	2			20128 – 68th Ave. W	27,640	27,640	27,640
R L H	9/1/82	1			19922 – 68th Ave. W	1,872	1,872	1,872
Horticulture Boiler Room	5/1/90	1			19806 – 68th Ave. W	96	96	96
Horticulture Green House	5/1/90	1			19806 – 68th Ave. W	4,356	4,356	4,356
Clearview Hall	7/1/90	2	2/15/2007	0	7030 – 196th St. SW	14,000	14,000	14,000
Triton Union Building	7/1/91	2			20200 – 68th Ave. W	25,782	25,782	25,782
Maltby Building	4/1/92	1			7020 – 196th St. SW	8,046	8,046	8,046
Horticulture Building	9/1/95	1			19810 – 68th Ave. W	4,000	4,000	4,000
Snohomish Hall	2/1/96	3			20226 – 68th Ave. W	50,400	50,400	50,400
Mill Creek Hall	2/1/00	2			20130 – 68th Ave. W	19,380	19,380	19,380
Indoor Hitting Facility	3/1/00	1			19828 68th Ave. W.	4,860	4,860	4,860
Snoqualmie Hall	8/16/02	3			20022 – 68 th Ave. W	50,538	50,538	50,538
Edmonds Conference Center	9/15/02	2			201 – 4th Ave.	12,270	12,270	12,270
Center for Families	8/3/03	1			20400 – 68 th Ave. W	15,542	15,542	15,542
Monroe Hall	1978	1	5/05 & 4/07		6606 196 th St. SW			10,608
Alderwood Hall	8/1/90	2			20210 – 68 th Ave. W	22,050	22,050	22,050
Mukilteo Hall/Black Box	12/1/07	4			20310 -- 68 th Ave. W.	67,279	67,279	67,279
ERC	7/1/06				9901 24th Pl. West Everett 98204	43,000	43,000	43,000
RLA (24'X60')	Leased	1			19916A 68 th Ave. W.	1,440	1,440	1,440
RLB (24'X60')	Leased	1			19916B 68 th Ave. W.	1,440	1,440	1,440
BTC	Leased	1			15620 Hwy 99, Suite 6B, Lynnwood	1,500	1,500	1,500
ATTC	Leased				2333 Seaway Blvd Everett 98203			2,439
North Campus Complex D	Leased	1			7016 – 196th St. SW			1,320
North Campus Complex E	Leased	1			7014 – 196th St. SW			10,764
Beresford Building	Leased	3			6600 196 th St. S.W.			32,000

Natural Gas

Puget Sound Energy provides natural gas to the campus, which is used for heating, cooling, and powering stand-by generation. Table 8 below summarizes the usage for the last three fiscal years. Information on gas utilization is available back through 1999.

Table 8: Natural Gas Purchases FY 2005-2008

ADDRESS	05 - 06	06-07	07-08
20000 68th Ave W	319604.457	288356.908	321133.883
20000 68th Ave W # Greenhouse	7688.0049	8153.8076	10150.0554
20000 68th Ave W # Student-Ctr	3137.5272	10773.0318	9360.8924
20010 68th Ave W	1586.0895	1541.9444	1744.3374
20014 68th Ave W	1224.3203	1060.8767	1475.7159
20022 68th Ave W	39.1971	113.5281	20.8992
20120 68th Ave W # Woodway Hall		6278.5681	7461.6713
20200 68th Ave W # Triton UN	128.8772	1053.9005	2507.6738
20400 68th Ave W	7956.7217	8131.7264	9513.5021
6600 196th St SW	6858.252	5820.7362	6549.2628
7014 196th St SW #10	5481.249	8809.7716	9306.1807
7014 196th St SW #6	4098.1263	4289.4282	4142.8432
7014 196th St SW #7	83.3812	1226.3176	4104.8831
7030 196th SW	3287.5827	3579.0596	4489.509

Waste Recovery

Information on waste recovery was sought from campus personnel who managed these activities. The data they supplied is provided in Table 9 below.

Table 9: Waste Recovery Information for FY 2005 - 2008

2004 – 2006	TONS/YR	DETAILS
Annual campus waste production in Short Tons	470.562	
Volume Recycled (approximately 50%)	236.686	
Volume Landfilled (approximately 50%)	233.87	No CH4 Recovery
Compost Volume	113.40	25% of overall waste
Solid Waste Incinerated for Local power (MMBtus)		None
Solid waste in a Waste to Energy Plant not Used For Local Power		none
Hazardous Waste	2.15	80% incinerated

Electricity

Snohomish County PUD provides electricity to the campus through a number of meters. Data across all meters was captured and aggregated into fiscal years 2005 – 2008.

Table 10: Electric Usage in kWh for FY 2005 – 2008

METER	05-06	06-07	07-08		METER	05-06	06-07	07-08
126355			6,158,400		432139	13,856	12,059	11,538
126263	536,100	563,700	555,600		420924	11,888	11,118	13,039
125244	194,160	202,960	207,040		420849	13,258	15,765	13,830
135629	181,920	184,080	175,760		420886	10,975	14,620	7,823
125635	112,080	117,680	136,080		420907	15,970	12,531	13,641
128623	119,120	122,160	48,080		420848	15,575	11,845	13,927
354462	15,735	21,604	13,170		420922	12,116	13,365	12,116
380835	5,389	8,051	1,586		420871	19,276	15,281	14,923
380835	5,389	8,051	1,586		315244	23,349	21,951	24,026
354061	14,602	38,742	10,210		397137	22,376	21,686	23,451
333593	16,270	21,454	11,143		420860	15,351	17,330	16,419
420216	67,270	80,153	29,940		397141	20,431	20,525	22,201
279796	55,708	58,570	34,606		397157	26,678	20,547	22,310
135356	43,280	49,120	28,160		397136	25,386	16,565	21,370
397153	47,570	54,319	52,024		127838	26,200	20,880	20,680
126613	7,428,600	7,299,000	1,862,100		420923	0	0	18,897
397132	8,059	7,261	5,049		420847	11,998	12,313	22,307
420921	18,433	8,721	15,994		341653	17,977	17,456	17,784
397140	1,973	12,509	9,388		420869	13,502	20,849	20,227
420872	14,027	15,384	16,530		420859	18,544	16,233	11,124
420850	11,726	13,747	9,674	Total kWh		9,226,728	9,192,134	9,722,167

SUMMARY OF GREEN HOUSE GAS MAP RESULTS

From the data above and other information, we used the calculator to generate information on emissions. This preliminary inventory serves as an initial estimate of greenhouse gas emissions for Scope 1 (direct emissions from on-site production), scope 2 (indirect emissions from electricity production) and partial Scope 3 emissions (indirect emissions from other activities) for the fiscal years running from July 2005 – June 2008, where that data is available or could be derived.

The analysis shows that Edmonds Community College was responsible for a total of 24,208 metric tons of CO2e (MTCDE) from reported sources during fiscal year 2007-2008 from its use of electricity, natural gas and propane. However, the actual MTCDE will be much larger when direct emissions from campus vehicles and indirect emissions from student and faculty commute and air travel are included in FY 2008-09

Understanding Emissions By Scope. Examining the emissions by scope in Table 11 reveals that the predominant amount of emissions are coming from direct emissions from campus operations, primarily from the use of natural gas.

Table 11: GHG Emissions by Scope FY 2005 – 2008

FY	SCOPE 1 Emissions	SCOPE 2 Emissions	SCOPE 3 Emissions	Net Emissions (MT eCO_2)
05-06	19,125	3,058	231	22,414
06-07	18,489	3,047	231	21,767
07-08	20,754	3,222	231	24,208

The **Scope 1 sources** contribute the largest proportion of the net emissions at **20,754 metric tons** of CO2 equivalents. Most of the Scope 1 emissions (in absence of calculations for direct use of vehicle fuel) comes from natural gas consumption, with only a minor amount coming from fugitive emissions from HVAC and chemical sources.

This is followed by the **Scope 2 sources** at **3,222 metric tons**. Scope 2 emissions from electricity are a lower portion of the whole, in part because of the use of natural gas for much of the heating needs and because our regional energy mix is already relatively low emissions.

The final category is **Scope 3 sources** at **231 metric tons**. These emissions calculations only include waste figures, and so are a lower part of the whole. Most campuses who have included staff and faculty travel are finding that this category as a subset of Scope 3 ends up representing the greatest impacts on their carbon footprint. It is likely that the FY 2009 -09 baseline that includes the travel survey will reveal the same.

FY 2006-07 shows a decrease over the previous year in net emissions while the campus population and square footage increased slightly by 3000 square feet. 2007-2008 saw an increase in leased square footage of 46,000 square feet with a slight increase in natural gas use.

Table 12: Total Emissions by Green House Gas

FY	Total Emissions (kg CO2)	Total Emissions (kg CH4)	Total Emissions (kg N2O)	Total Energy Use (MMBtu)
05-06	22,119,115	11,988.63	56.32736	402,081.4
06-07	21,475,009	11,925.35	54.9947	389,943.8
07-08	23,908,335	12,151.94	60.55398	435,065.5

Emissions by Type of GHG. Table 12 at right illustrates the emissions each year from the three major gases, CO_2, CH_4, and N20. It also illustrates the total energy use for each year. Interestingly, energy use decreased in FY 2006-2007.

Comparison to Other Institutions. Requests are out to regional utilities to secure local greenhouse gas inventories, and the 2008-09 collection will draw a comparison of EdCC emissions to those of peer organizations. Table 13 below shows where EdCC compares to other schools. This comparison is not entirely accurate with this preliminary inventory, however, since the scope 1 emissions do not currently include vehicle fuels.

Table 13: Comparison to Other Schools

School	FY	MTCDE	FTE (U/G)	MTCDE / FTE
Edmonds Community College	07	24,208	6,788	3.56
College of Charleston	01	38,712	9,820	3.9
Oberlin	00	50,417	2,800	18.0
NKU	07	77,363	11,502	6.7
UT – Knoxville	06	263,374	26,476	9.9
Harvard	06	385,668	6,715	57.4
Yale	02	284,663	5,300	53.7
Source: Modified from UTK Preliminary Greenhouse Gas Emissions Inventory 2006				

LEVERAGING THE INVENTORY TO BUILD A SUSTAINABILITY PLAN

Moving from a preliminary inventory to a sustainability plan involves several key steps:

- Setting GHG Emission Goals
- Evaluating and Defining Corrective Actions
- Establishing an Ongoing GHG Inventory and Sustainability Audit Function

Each of these steps are summarized below. Goal approaches, possible actions, and subsequent plans for GHG inventories will be discussed in an on-campus meeting to review the inventory and will be developed into a plan to work towards carbon neutrality.

Setting GHG Emission Goals.

There are many ways to set sustainability and emission goals—targets to a particular baseline year or an outside index, or a specific amount or percentage reduction in overall tonnage or a particular category of energy or resource consumption. The materials around the president's climate commitment outline some example approaches:

As examples, some universities commit to a particular amount of metric tons of emissions reductions per year. Other schools have tied their commitments to state-level executive orders to reduce emission levels down or below a particular baseline (as in reduce emissions to 2000 levels by 2010). In other institutions, they've committed to reduce energy consumption by 20% in existing facilities within a five year period, with the most recent inventory year as the baseline year.

Goals can take a number of forms:

- Absolute--reduce total emissions by 15 percent from 2009 – 2015
- Normalized--reduce emissions by 12 percent per square foot of building space from 2009 – 2015
- Index—reduce emissions by 13 percent per production index from 2009 – 2019
- NetZero/Carbon Neutral—achieve netzero emissions by 2015 and maintain that level through 2020.

Setting goals that are meaningful and achievable for the campus will be important.

Evaluating and Defining Corrective Actions

Meeting those goals involves making key changes in campus operations and student and faculty behaviors. There are several tangible actions that the college can take to reduce its greenhouse gases. The ACUPCC outlines seven possible "tangible actions" the University can take to fulfill its two year action deadline. These are to: (a) establish an explicit green building policy, (b) adopt an Energy Star procurement policy, (c) offset all air travel emissions through an official policy, (d) encourage public transportation use, (e) purchase at least 15 percent renewable energy within one year, (f) support climate-friendly investing, and (g) participate in RecycleMania and adopt at least three additional waste reduction measures (ACUPCC, 2007).

There are, in fact, many other actions that can also help to reduce energy consumption and bring down emissions. Appendix A lists a broad set of potential initiatives that include 1) items that campus management can do, 2) actions targeted at faculty and students, and 3) opportunities outside campus into local infrastructure. These actions are summarized into a variety of categories:

- **Operations**—focuses on the day to day running of the school
- **Energy**—specific initiatives on the energy sources
- **New Buildings**—new construction opportunities around energy usage
- **Buildings**—retrofit and management modifications on existing buildings
- **Grounds**—landscaping and management of the overall campus
- **Fleet**—the vehicles owned or managed by the campus
- **Commutes**—daily/weekly travel to and from campus by faculty, students and staff
- **Air**—air travel associated with campus activities
- **Waste**—waste, composting, and recycling activities

Ultimately, an important step is the evaluation to determine which of these activities make the most sense for a particular campus. When done well, the initiatives chosen represent real value for the campus, which makes it easier to articulate them in a way that secures support for them among campus decision-makers. These goals then tie to emission and savings outcomes to make them more attractive and understandable by others on campus.

For instance, the same university committing to the 20% reduction in energy consumption in the goal example raised above calculates that they will save more than 32 million kWhs annually, resulting in cost avoidance in excess of 2 million dollars per year (using 2005-2006 energy costs). This 20% reduction in energy consumption will also result in annual carbon dioxide emissions being reduced by approximately 50 million lbs. In another example, a four miles per gallon increase in fuel efficiency for one campus was projected to achieve a 20% improvement in gas mileage and a 20% reduction in greenhouse gas emissions.

Proposed measures to evaluate potential initiatives include the following criteria:

- ***Cost Criteria***--Cost for implementation, percent pay-back per year, payback time, free-cash flow generated
- ***Environmental Criteria***--Potential emissions reduction, consistency with sustainability priorities
- ***Financing Viability***-- Funding sources, assistance/support available
- ***Implementation Criteria***-- Ease of implementation, examples of others doing It, implementation timeframe
- ***Promotion Value***—Visibility, campus community reaction

The calculator used in this project should also be incorporated into the analysis of particular projects, by helping to assess the project's energy and greenhouse gas impact. These factors can help screen alternative plans and weigh in on a various courses of action to towards carbon neutrality goals. GHG considerations should ultimately be incorporated into campus budget processes for buildings, grounds, fleets, etc.

This discussion will be addressed in the on-campus meeting to cover the inventory. Doing this effectively involves selecting measures that aid in identifying those initiatives that would have the most impact.

Establishing an Ongoing GHG Inventory and Sustainability Audit

We will use the upcoming collection for FY 2008 -09 to build a more robust baseline and to develop and ongoing collection mechanism. That involves several key areas:

- **Roles and Responsibilities**—defining who on campus will be responsible for the annual collection, and how those will the data will make it a normal part of their routine to provide the data in a timely fashion without significant prompting
- **Training**—initial training will help the Sustainability Council complete the FY 2008 -09 baseline, and can be used to build a training module as a potential component of a GHG curriculum.
- **Document Retention and Control**—we will us this inventory and the data collected as a starting point to establish a place to keep the data centrally, establish internal auditing to verify data accuracy.
- **Management Review Process**—there should be an annual process to review performance and outputs from implementation of various initiatives, and set priorities
- **Corrective Action**--the results from the inventory and audit should be used as a benchmark for developing plans to move forward with additional initiatives to improve systems and behaviors across campus and in the local community to secure energy savings and emission reductions.

Each of the steps above will be addressed at an upcoming on-site campus meeting where we will discuss goals, selecting reduction activities, and future inventory approaches. The value of and approach to a climate-related curriculum will be outlined with the academic representatives on campus, and may have implications for how future inventories are completed. Table 14 below outlines the next steps for the Sustainability Council.

Table 14: Overview of GHG Project and Next Steps

ACTIVITY	STATUS & TIMING	LEAD ORGANIZATION
Choose Calculator and Inventory Protocols	Complete	NextGen
Initial Data Collection & Preliminary Report Generation	Complete	NextGen
Verify Data Sets	In Process	NextGen
Conduct on-campus meeting with sustainability group to review inventory	May 2009	NextGen
Establish protocol to secure scope 3 emissions and complete inventory for 2008-2009 year	June 2009	Sustainability Council, with NextGen Support
Develop sustainability plan and long-term strategy to reduce emissions	June 2009	Sustainability Council, with NextGen Support
Make inventory available to students and faculty online	July 2009	Sustainability Council
Develop plan to integrate sustainability into curriculum	August 2009	Sustainability Council
Submit Climate Action Plan to ACUPCC	By 8/15/09	Sustainability Council

Appendix A: Example of Potential Actions in a Sustainability Plan

	College & Campus Operations	Students & Faculty	Local Community Infrastructure
Operations	• Institute green IT programs to manage power consumption, monitor replacements • Server consolidation to reduce HVAC requirements • Institute a lights-out-at-night policy • Implement environmentally preferable purchasing program • Replace regular cleaning products with green cleaning materials • turn the heat in buildings down from 70ºF to 68ºF	• Promote water conservation through technological and behavioral modification • Promote participation in a local green business program	• Provide assistance with green practices across campus
Energy	• Explore alternative energy production on campus--solar panels, solar thermal, etc. • Purchase green electricity from solar, geothermal, wind or hydroelectric sources • Purchase green tags / renewable energy certificates • Plant trees for energy savings • Implement district heating and cooling • Install energy-efficient cogeneration power production facilities • Explore advanced approaches to chiller management	• Launch an “energy efficiency challenge” campaign for students and faculty--turn lights off when leaving a room, unplug appliances (TVs, radios, and transformers for computers and cell phones) • Launch academic holidays, where all appliances are turned off, including clocks and refrigerators. • Work with utility to distribute free CFL bulbs and/or fixtures, halogen torchiere lamps etc. to faculty and students	• Encourage the use of renewables and more system efficiencies in your local utilities • Partner with utilities to hold a community fair to offer energy efficiency information, technical assistance, training and incentives
New Buildings	• Establish an explicit green building policy that addresses resource efficiency, approaches to water/waste/stormwater management, soil erosion and sediment controls, recycling and more, using either LEED or another approach.		• Participate in green building discussions to enhance building practices community-wide

Appendix A: Example of Potential Actions in a Sustainability Plan

	College & Campus Operations	Students & Faculty	Local Community Infrastructure
Buildings	• Create a Building Commissioning Team to put buildings on a commissioning cycle (recommend 4 years) • Conduct a regular energy audit of facilities to identify new issues • Install green or reflective roofing • Install energy-efficient vending machines • Implement an energy tracking and management system • Install energy-efficient exit sign lighting • Perform energy-efficient lighting retrofits • Install occupancy sensors. • Perform heating, cooling and ventilation system retrofits (e.g., chillers, boilers, fans, pumps, belts) • Install ENERGY STAR appliances.	• Encourage faculty and students to purchase Energy Star Appliances for their homes	• Promote green building practices through a local ordinance or green building program
Grounds	• Explore irrigation alternatives and better use of stormwater/greywater • Institute programs to preserve open space • Improve water pumping energy efficiency • Install a central irrigation control system • Install energy-efficient outdoor lights (e.g., high pressure sodium) • Decrease average daily time outdoor lights are on	• Encourage the planting of trees at faculty and student homes with urban forestry practices.	
Air Travel	• Make a policy offsetting all greenhouse gas emissions for air travel paid offset all University-sponsored air travel emissions	• Ask students and faculty to purchase off-set credits for their college-related air travel	

Appendix A: Example of Potential Actions in a Sustainability Plan

	College & Campus Operations	Students & Faculty	Local Community Infrastructure
Fleets/Vehicles	• Retire old and under-used vehicles • Purchase fuel-efficient vehicles (e.g. scooters, bicycles) for local use • Utilize biodiesel, ethanol, compressed natural gas, hydrogen or fuel cells in fleet • Limit idling of campus vehicles with policies and programs • More efficient routing and train "eco-friendly" driving • Better vehicle maintenance--annual tune ups, maintenance checks, proper tire inflation. Train driving behaviors around "eco-driving". • Green fleets through buying low-emission, fuel efficient alternative fuel and/or hybrid-electric technology vehicles. • Add emission-control technologies	• Offer prioritized parking for hybrid cars • Initiate a community biodiesel purchasing coop or fueling station, or electric charging station on campus • Promote community purchases of compact and hybrid vehicles • Encourage eco-friendly driving for faculty and students	• Explore agreements to share vehicles with city • Work with the local communities to Improve traffic signal synchronization to decrease stop rate and time • Encourage electric charging infrastructure build
Commute	• Encourage car-pooling or van-pooling by employees • Institute flexible hours and telecommuting	• Encourage faculty and students to take alternative modes for their daily commute at least once a week—car-pooling, cycling, public transit • Offer video-conference, webcast, and online webinar communication options for education • Provide free bicycles for faculty or student use • Encourage car-sharing, support carsharing services, e.g. Zipcar	• Request expansion in local or regional bus service in range and/or frequency • Encourage exploration of new lightrail systems • Create bicycle and pedestrian friendly travel routes. (e.g., dedicated bicycle lanes, additional bicycle parking)

Appendix A: Example of Potential Actions in a Sustainability Plan

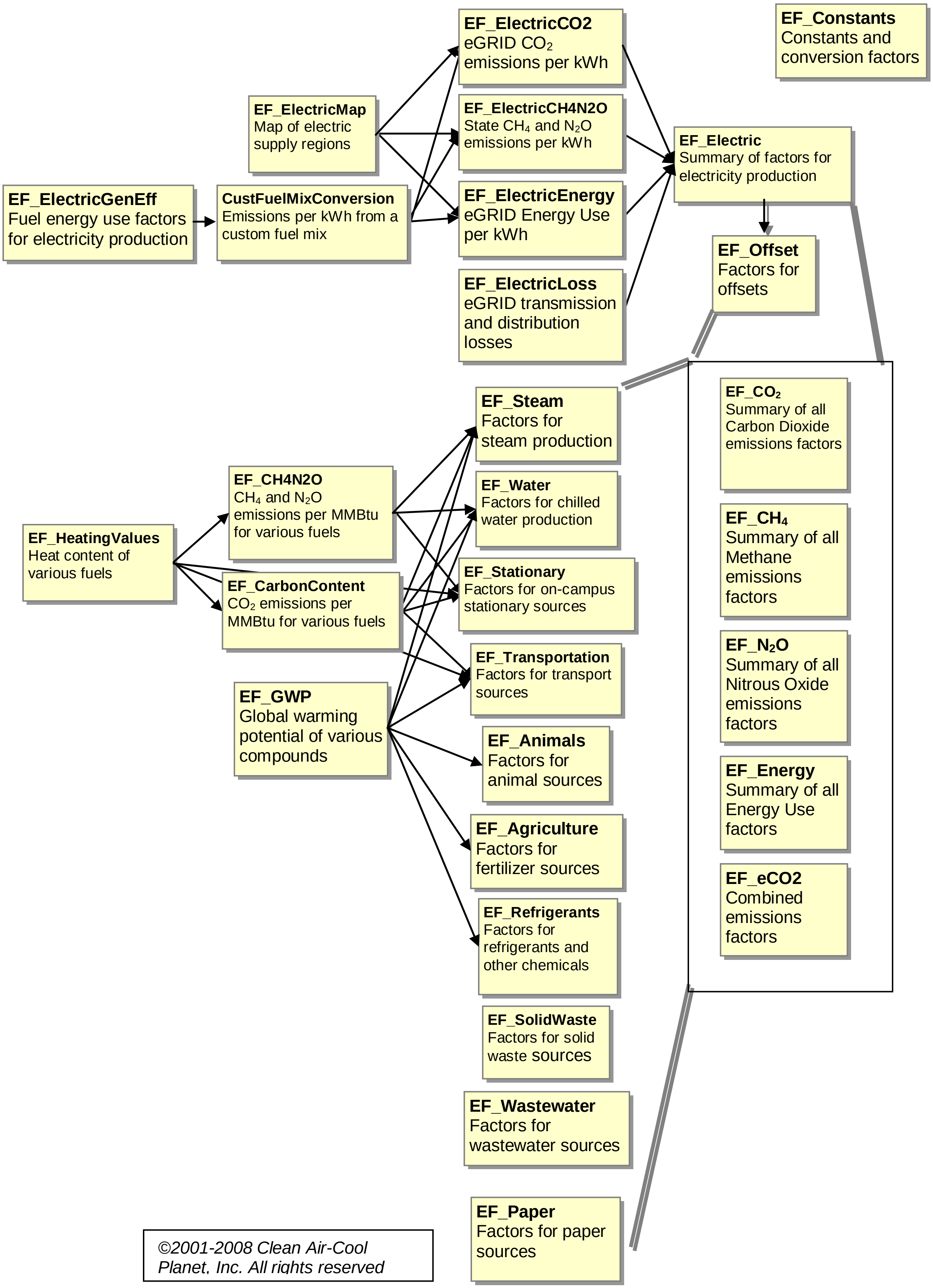
	College & Campus Operations	Students & Faculty	Local Community Infrastructure
Waste	• Chose Waste Services with CH4 Recovery or electric generation • Increase organics and yard debris collection and composting • Establish system for reuse or recycling of construction and demolition materials • Implement solid waste reduction programs • Expand recycling programs	• Offer recycling education • Implement solid waste reduction program through creation of reuse facilities /programs • Establish system for reuse or recycling of construction and demolition materials • Conduct "by-product" challenges to encourage students to think about how to extract more value from wastes	• Encourage methane recovery in local landfills • Request expansion of recycling programs in the community • Request installation of an anaerobic digester at the wastewater treatment facility • Encourage methane recovery in local wastewater treatment plant

Appendix B: GHG Data Categories

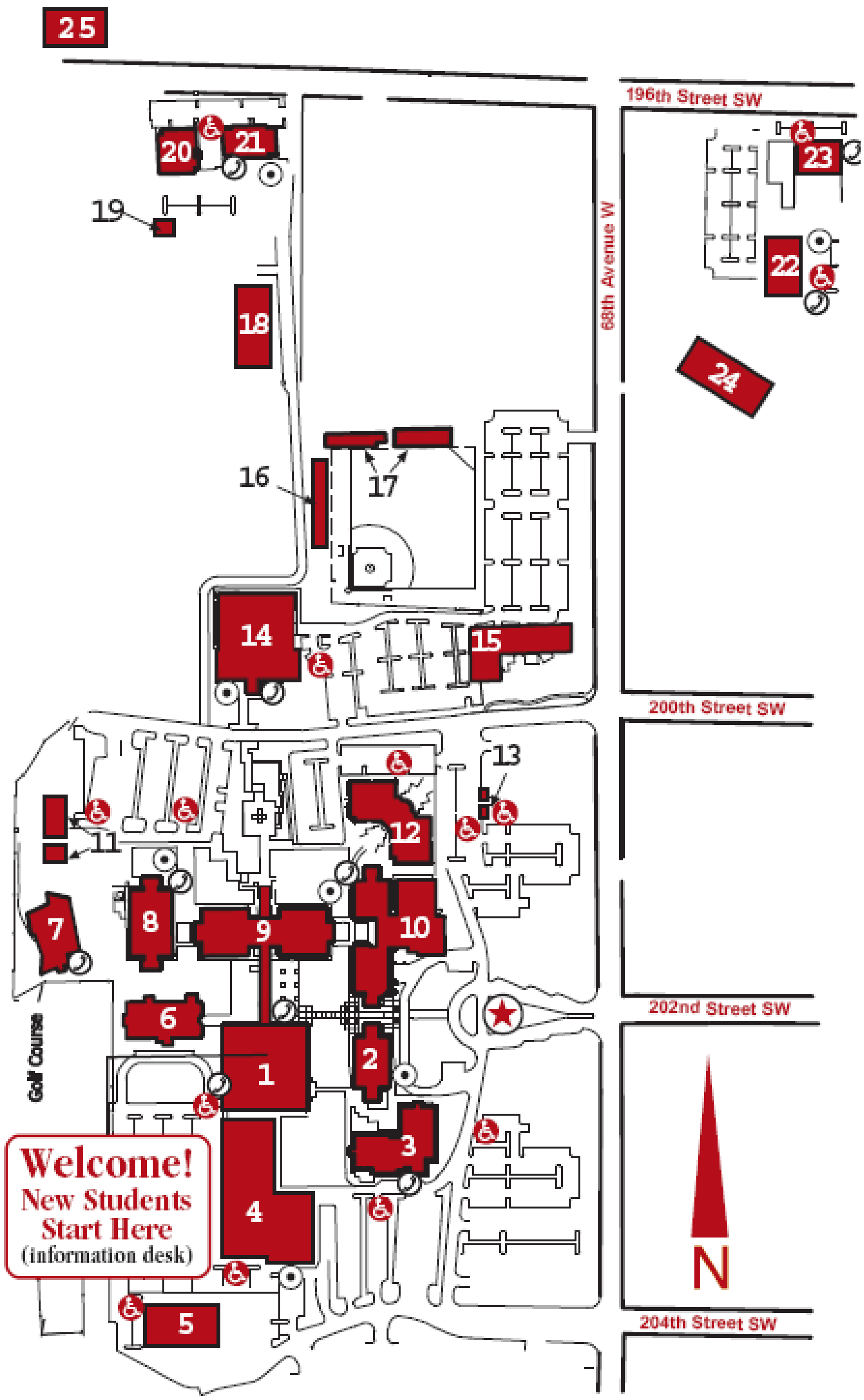
	Category	Subcategory	Units
Institutional Data	**Budget**	Operating Budget	$
		Research Dollars	$
		Energy Budget	$
	Population	Full Time Students	#
		Part-Time Students	#
		Summer School Students	#
		Faculty	#
		Staff	#
	Physical Size	Total Building Space	Square feet
		Total Research Building Space	Square feet
Purchased Energy	Electric produced off-campus	Fuel mix either standardized by region, or set based on more specific info from the utility	kWh
	Steam and Chilled water produced off-campus	Purchased Steam (broken out by steam fuel mix)	MMBtu
		Purchased Chilled Water (broken out by fuel mix)	MMBtu
On-campus Generation	On-Campus Cogeneration Plant	Residual Oil (#5 - #6)	Gallons
		Distillate Oil (#1 - #4)	Gallons
		Natural Gas	MMBtu
		Propane	Gallons
		Coal	Tons
		Electric Output	kWh
		Steam Output	MMBtu
		Electric efficiency	%
		Steam Efficiency	%
	This category includes all stationary sources of emissions on campus (heating, cooling, cooking, laboratories, etc)	Residual Oil (#5 - #6)	Gallons
		Distillate Oil (#1 - #4)	Gallons
		Natural Gas	MMBtu
		Propane	Gallons
		Incinerated Waste	MMBtu
		Coal	Short Ton
		Other A	MMBtu
		Other B	MMBtu
		Other C	MMBtu
		Solar / Wind / Biomass	MMBtu
Transpo rtation	University Fleet	Gasoline Fleet	Gallons
		Diesel Fleet	Gallons
		Natural Gas Fleet	MMBtu
		Electric Fleet	kWh
		Other Fleet	MMBtu
Commuters	Air Travel	Faculty / Staff Business	Miles
		Student Programs	Miles
	Commuters	Faculty / Staff Gasoline	Gallons
		Students Gasoline	Gallons
		Faculty / Staff Diesel	Gallons
		Students Diesel	Gallons
		Faculty / Staff Electric	kWh
		Students Electric	kWh

	Category	Subcategory	Units
Agriculture	Fertilizer Application	Synthetic	Pounds
		% Nitrogen	%
		Organic	Pounds
		% Nitrogen	%
	Animal Agriculture	Dairy Cows	#
		Beef Cows	#
		Swine	#
		Goats	#
		Sheep	#
		Horses	#
		Poultry	#
		Other	#
Solid Waste	Includes all solid waste produced by campus except waste composted, recycled or burned on campus for power	Incinerated Waste (waste to energy plant) not used for school power—Mass Burn Incinerator	Short Tons
		Incinerated Waste (waste to energy plant) not used for school power—Refuse Derived Fuel (RDF) Incinerator	Short Tons
		Landfilled Waste with no CH4 Recovery	Short Tons
		Landfilled Waste with CH4 Recovery and Flaring	Short Tons
		Landfilled Waste with CH4 Recovery and Electric Generation	Short Tons
Refrigeration and other Chemicals (PFCs, HFCs, SF6)	All other greenhouse gases	HFC-134a	Pounds
		HFC-404a	Pounds
		HCFC-22	Pounds
		HCFE-235da2	Pounds
		Others	Pounds
		HG-10	Pounds
		Sum	kg
OffSets	Actions taken to offset emissions	Renewable Energy Credits	kWh
		Composting	Short Tons Compost
		Forest Preservation	Metric Tonnes CO_2

Appendix C: Conversion Path in the Clean Air/Cool Planet Calculator



Appendix D: Edmonds Community College Campus Map



Appendix E: Building Summary for Edmonds Community College

Building		Purpose	Building		Purpose
Alderwood Hall	ALD	Computer Labs Humanities/Social Sciences Division Math/Science Division	Mill Creek Hall	MIC	Digital Music Labs Music Department Recording Studio
Beresford Building	BER	Allied Health Care Lab Computers, Electronics & Networks Lab	Mountlake Terrace Hall	MLT	Career Action Center Classrooms Counseling and Resource Center Triton Espresso Stand Print and Mail Center Science Labs Services for Students with Disabilities TRIO Student Support Services Testing Center Worker Retraining
Brier Hall	BRI	Bookstore and Edpass Office Classrooms College Café Culinary Arts Program Triton Marketplace (cafeteria) Science Labs Student Center Student Government Student Life Office	Mukilteo Hall	MUK	ABE, Adult High School, EdCAP, GED Black Box Theatre Bridge Classrooms ESL Classes (English as a 2nd Language) Learning Support Center (tutoring) Math Lab
Center For Families	CFF	Childcare Cooperative Preschool HeadStart Classroom Parent Education Classses	Relocatable Buildings	RLA RLB RLH	Campus Security Pre-apprenticeship Construction Industry Training
Clearview Building	CLA	Business Office Organizational Development & Employee Training (ODET) Human Resources	Seaview Hall	SEA	Athletics Department Classrooms Gymnasium
Duplex Buildings	DUN DUS	International Student Services	Snohomish Hall	SNH	Business Division Classrooms College Relations and Advancement Computer Labs Vice President for Instruction Office Health and Human Services Division President's Office The Foundation
Horticulture Buildings	HGH HRT	Greenhouse Classrooms/Boiler	Snoqualmie Hall	SQL	Central Washington University Classrooms

Building		Purpose	Building		Purpose
Lynnwood Hall	LYN	Admissions Advising Art Gallery Assessment Cashier's Office Computer Labs Enrollment Services Information Desk Library Media Services Registration Running Start Office Student Financial Services Veterans' Programs	Student Residence Hall (at Somerset Village)		Student Residence Hall (at Somerset Village) Housing Office (until fall 2009)
Maltby Building	MAB	Workforce Development Center WorkFirst	Student Residence Hall (at Sophie Court)		Student Residence Hall (at Sophie Court)
Meadowdale Hall	MDL	Art Department Classrooms	Triton Union Building	TUB	Equity and Diversity Center Game Room Golf Shop Mulligan's Café Student Lounge
Monroe Hall	MON	Materials Science Lab			

Appendix E: Draft Campus Commute Survey for Student, Staff & Faculty

This survey is designed to collect commuting information from our students, staff and faculty. Results from this survey will be used to help complete our greenhouse gas inventory as part of our commitment with other colleges and universities all across the country to become carbon neutral. This survey asks a number of questions about your commutes to campus, as well as your school-related trips off-campus. If you have any questions about this survey, please contact [insert contact here].

Basic Information

I am primarily a (select one): Student, faculty, staff
My major/department is: (open ended)
My email address is: (open ended, with email verification)
Please keep me updated on campus sustainability activities (checkbox)

Daily/Weekly Campus Commute

Approximately how many days a week did you come to campus this fiscal year
___ Summer Session July 1 2008 to Date
___ Fall Session Date to Date
___ Spring Session Date to Date

While school is in session, how far from campus do you live (in miles)?

How did you get to campus? Please enter your best estimate of the number of times a week spent commuting to and from work by the following methods: [NOTE—a roundtrip would be counted as 2 trips] (range of 0 to 50)
Drive Alone __________ trips a week
Carpool ___________ trips a week
Bus ___________ trips a week
Motorcycle or Electric Bike ___________ times a week
Bicycle ___________ times a week
Walk ___________ times a week
No Commute (Took Classs/Worked at Home) ___________ times a week

Please provide fuel usage information for each of the commute methods indicated above:
Drive Alone
Miles commuted per one-way trip: _____________
Vehicle fuel efficiency (miles per gallon or kWh): _____________ (5 mile increments, start with 10 – 15 end with 45+)
What vehicle Fuel does your car use? (select
Gasoline (this applies to regular and hybrid electric vehicles)
Diesel
Biofuel/Biodiesel
Electricity (100% electric only)
How many miles per week do you drive to travel elsewhere than to and from campus? (range between 0 and 500 miles)

Carpool
Average persons per vehicle: _____________ (selections include 1, 2, 3, and more than three)
Miles commuted <u>per one-way trip</u>: _____________
Vehicle fuel efficiency (miles per gallon or kWh): _____________
Vehicle Fuel

- Gasoline (this applies to regular and hybrid electric vehicles)
- Diesel
- Electricity (100% electric only)

Bus
Average # bus passengers: _____________
Miles commuted <u>per one-way trip</u>: _____________
Bus Fuel
Natural Gas
Diesel
Do not know

Motorcycle
Typical miles commuted <u>per trip</u>: _____________
Vehicle fuel efficiency (miles per gallon or kWh): _____________
Average Persons Transported: _____________

Travel to and From Permanent Home

Do you have a permanent home that you return to each year? This section asks about those flights that you take related to school activities (e.g. field studies, etc.) or returning home.

Air travel
How many air travel trips per year do you take that are related to off-campus school activities or returning home to family? (range of 0 – 50)
How far is the average roundtrip? (range of 0 and 25,000 miles)

Bus
How many bus (Greyhound, airport shuttle, etc.) travel trips per year do you take that are related to school activities or returning home to family? (range of 0 to 50)
How far is the average round trip? (range between 0 and 8000)

Train
How many train travel trips per year do you take that are related to school activities or returning home to family ? (between 0 – 50)
How far is the average roundtrip? (between 0 and 8000 miles)

Optional Contact Information
Name: ______________________________
Telephone: ______________________________
Thank you!