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Greenhouse Gas Inventory

SUNY Jamestown Community College

A GHG inventory, essential to a legitimate GHG reduction strategy, reinforces an organization's commitment to addressing climate change. Recognizing this, SUNY Jamestown Community College became a signatory to the American College & University Presidents Climate Commitment on April 23rd, 2008. The commitment requires the college to develop and implement strategies to reduce GHG emissions. This inventory identifies, quantifies, and categorizes sources of GHG emissions at SUNY Jamestown Community College with the intent of both establishing a GHG emissions baseline and identifying action steps for reducing the college's carbon footprint.

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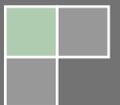


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Executive Summary

Upon signing the American Colleges and Universities Presidents Climate Commitment (ACUPCC) in April of 2008, SUNY Jamestown Community College assigned several student interns and volunteers the task of completing a total greenhouse-gas emissions inventory of the college under the supervision of the sustainability consultant. After several months of collecting data from different departments and facilities staff, the team completed the inventory in August of 2009. The following outlines the college's GHG emissions by sector.

	Metric Tons of CO ₂ Equivalent	Percent of Total Emissions
Scope 1		
Refrigerants (R-22):	166.6	1.12
Vehicle Fleets:	93.7	0.63
Fertilizer Application:	.1	0.00
On campus stationary (Natural Gas)	1863.2	12.53
Scope 2		
Purchased Electricity:	4522.3	30.40
Scope 3		
Scope 2 T&D Losses	447.3	3.01
Faculty and Staff Commuting:	1234.1	8.30
Student Commuting	6426.3	43.20
Directly Financed Air Travel	10.9	0.07
Directly Financed Outsourced Travel:	37.6	.25
Solid Waste:	30.9	.21
Paper	41.3	.28
Total	14874.3	100.00

As shown in both the table above, commuting accounts for over half of the emissions at the college with combined student and staff emissions of 7660.4 MTCO₂e (51.5%) Other notable sectors are purchased electricity at 4522.3 MTCO₂e (30.40%), and on campus natural gas combustion at 1863.2 MTCO₂e (12.53%). As a result, travel habits and electricity use hold the greatest opportunity for improvement.

The commuting emissions caused by daily travel to and from rural campuses results in extremely high GHG emission totals. This results in decreased percentages of emissions from other sources, causing them to appear less significant. In this inventory, emissions from refrigerants, fertilizer application, solid waste, paper use, vehicle fleets, and outsourced travel reflect a low percentage of emissions, but will still be targeted for reductions where possible.

According to the ACUPCC, a Climate Action Plan or a Plan for Climate Neutrality should be completed following a GHG Inventory. Based on the results of this inventory, it is recommended that the following be included in this plan:

- An energy policy with an outline for enforcement
- A timeline and plan for running a Transportation Conservation campaign
- A Green Purchasing Policy including purchasing requirements and recommendations
- Plans for a Waste Composition Report to evaluate recycling participation
- A Plan for instituting sustainability education programs or committees

College	MTCO ₂ e/ student
Tufts University	2.50
Champlain College	2.68
Lewis and Clark	3.40
University of New Hampshire	4.55
SUNY JCC	6.34
Connecticut College	9.00
Carlton College	9.20
Harvard University	10.00
Smith College	12.70
Middlebury College	14.39
Oberlin College	17.00

Other smaller steps include considering alternative power sources and making information about public transportation and carpooling more accessible on each campus. It would also be beneficial to involve student senate and other college organizations in coordinating future sustainability efforts (club projects or fundraisers).

Acknowledgements

Completing the Greenhouse Gas Inventory for SUNY Jamestown Community College required participation from various operational areas and departments throughout the college. The GHG Inventory Project Team would like to thank the following individuals for their contribution to the inventory data collection and reporting process.

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Introduction

Jamestown Community College and the President’s Climate Commitment

On April 23, 2008, SUNY Jamestown Community College signed the American College and University’s President’s Climate Commitment (ACUPCC). As mandated by the commitment all participating colleges and universities must complete an inventory of all their greenhouse gas (GHG) emissions within a year of signing. Within two years, they must develop comprehensive institutional plans, interim goals, deadlines, and tracking systems for becoming “climate-neutral” — reducing or offsetting all greenhouse gas production to create a “neutral” effect on global warming. Ideally, the greenhouse gas inventory effort will set the stage for developing a

Climate Action Plan, which will document how the college intends to achieve climate neutrality.

This inventory identifies sources of GHG emissions across the multiple campuses that comprise SUNY Jamestown Community College. It then quantifies and categorizes these sources with the intent of both identifying and establishing an emissions baseline. Finally, this inventory report analyzes the results of this inventory by identifying possible action steps for reducing the college's carbon footprint.

GHG Accounting and Reporting Principles

In order to conduct a truthful and fair inventory of the college's GHG emissions, certain principles were accepted as boundaries for whether to report various categories. These principles are as follows:

1. **Relevance:** Ensure that the GHG inventory appropriately reflects GHG emissions and serves the decision-making needs of users—both internal and external.
2. **Completeness:** Account for and report all GHG emission sources and activities within the defined inventory boundary.
3. **Consistency:** Using consistent methodologies to allow for meaningful comparisons of emissions over time.
4. **Transparency:** Address all relevant issues in a factual and coherent manner, based on clear data.
5. **Accuracy:** Ensure that the quantification of GHG emissions is neither systematically overstating nor understating your true emissions.

Data Sources and Methodology

The Six Greenhouse Gases

As required by the ACUPCC, the college must report emissions of all six internationally-recognized greenhouse gases regulated under the Kyoto Protocol:

1. Carbon dioxide (CO₂);
2. Methane (CH₄);
3. Nitrous oxide (N₂O);
4. Hydrofluorocarbons (HFCs);
5. Perfluorocarbons (PFCs); and
6. Sulfur hexafluoride (SF₆).

Data Sources

As is standard in the practice of GHG inventories for institutions like SUNY JCC, the calculations of greenhouse gases were organized into three levels, or scopes, to increase transparency and facilitate fair comparisons.

The CA-CP Campus Carbon Calculator was very helpful in discovering the sources of GHG emissions. It breaks down scopes 1, 2, and 3 into source categories. The following are the standard definitions for these scopes and the source categories at SUNY JCC.

Scope 1 refers to direct GHG emissions occurring from sources that are owned or controlled by the institution. For SUNY JCC, this includes the following:

- Refrigerants (specifically HCFC-22 or R-22)
- Vehicle Fleet gasoline combustion
- Fertilizer application across campuses
- On campus combustion

Scope 2 refers to indirect emissions generated in the production of electricity consumed by the institution.

- Electricity purchased from National Grid and Jamestown Board of Public Utilities

Scope 3 refers to those indirect emissions that are a consequence of the activities of the institution. This included the following:

- Commuting to and from the campuses
- Directly financed outsourced travel

Assessment Tools

This assessment was conducted with the use of the Clean Air-Cool Planet Calculator (CA-CP).

Website: <http://www.cleanair-coolplanet.org>

Other tools that were used to evaluate and interpret data include:

The GRP

Is an instruction guide that outlines the principles, calculation methodologies and procedures required by the California Registry, the most stringent climate action registry in the United States to date. It was used as a manual for formulas and procedures used in this inventory.

Website: www.climateregistry.org

The GHG Protocol

is a unique multi-stakeholder partnership of businesses, NGOs, and governments, led by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). It serves as the premier source of knowledge on corporate GHG accounting and reporting and draws on the expertise and contributions of individuals and organizations from around the world. A majority of the definitions found in this report and in the GHG Inventory Instruction Guide were found using this resource.

Website: www.ghgprotocol.org

EPA GHG Tools and Conversion websites

were used to convert measurements into those used by the CA_CP calculator and to double check all calculations for consistency.

Websites:

<http://www.epa.gov/climateleaders/>

<http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

- Solid waste
- Paper
- Scope 2 Transmission & Distribution losses

Source: ACUPCC Implementation Guide

Organizational Boundaries

When completing an inventory, organizational boundaries must be determined to identify which buildings and spaces are to be included in the inventory. In this case, SUNY JCC chose to complete this inventory using the control approach; more specifically, the operational control approach. This means that all buildings and spaces over which the college has power of management over the daily activities of business are to be included in the inventory. The dorms, which were not in use during the chosen inventory year, fall under this control and will be included in future inventories.

Reporting Year

A reporting year is the year in which the emissions occurred. In this case, the timeline for data gathered was September of 2007 through August of 2008. Because a majority of the emissions occurred within the year of 2008, the reporting year of this inventory is 2008.¹ In the future, a trend analysis may be conducted using data from multiple years. There was insufficient data and time available to run this type of analysis as part of this inventory.

Methodology

Two student interns, two student volunteers, and two faculty sponsors undertook the task of completing a total greenhouse-gas emissions inventory of the college under the supervision of the sustainability consultant. Following a training session provided by Josh Wilson of Ecology and the Environment based out of Rochester, team members defined organizational boundaries and identified sections to be included in the inventory. Team members then followed the data collection procedure below.

1. Receive weekly data collection assignments
2. Identify campus data sources and enter into contact list
3. Contact identified sources and record both information and time of call
4. If contact name changes, record and enter into contact list
5. Receive emissions factors
6. Calculate emissions based on received emissions factors
7. Verify data

To ensure accuracy, once information was received and calculated, it was verified and calculations were double-checked by the sustainability consultant. The report itself was sent to the faculty sponsors, a team of editors and to Josh Wilson to be reviewed and edited.

¹ This timeframe was chosen because it follows the operating year of the college. A majority of the data available is listed by month and is therefore easy to process.

Current GHG Emissions by Scope

Scope 1 Emissions Sources

On-Campus Stationary Sources: Refrigerants

SUNY JCC currently uses multiple refrigerants to meet cooling demands, but only R-22 is considered an HCFC and should be included in this inventory. The college does not currently record information on refrigerant usage on campus or escapee emissions of refrigerants. Therefore, estimated escapee emissions of R-22 are based on a collection of work orders from the 2008 identified inventory timetable. These work orders are kept in the office of Buildings & Grounds and describe how much R-22 is added and how much was reclaimed or recycled. It was assumed that what is added for the year would be the escapee emissions for that timeframe. The net R-22 added to the system during the 2008 inventory year was 215.5 lbs. This figure was then multiplied by the GWP number for R-22 and converted to MTCO₂e. R-22 has a GWP of 1700.

Total Refrigerant Emissions = 166.2 MTCO₂e, accounting for approximately 1% of total emissions.

Direct Transportation Sources: Vehicle Fleets

All direct transportation sources, including lawn care equipment, gasoline vehicles, and diesel fuel vehicles operated by SUNY Jamestown Community College comprise the Vehicle Fleets section. Emissions from vehicle fleets are based on total fuel consumption during the 2008 inventory year; these fuels emit carbon dioxide, methane, nitrous oxide, and hydro-fluorocarbons.

SUNY JCC uses Sunoco, Exxon Mobil, and other credit cards to purchase gasoline and diesel fuels for the vehicle fleet and lawn care equipment. The business office keeps a list of invoices from these credit cards, and from these invoices the total gallons of fuels purchased for the 2008 inventory year were summed. The buildings and grounds staff used a total of 9999.3 gallons of gasoline and 446.1 gallons of diesel in the reporting year. The CA_CP calculator gave the following results:

Total Vehicle Fleet Emissions = 93.7 MTCO₂e; accounting for 1% of total emissions.

Chemicals

Lab chemicals, a common GHG emissions category in campus inventories, can potentially produce green house gases. Data on SUNY JCC's lab chemical disposal was provided courtesy of the senior lab technicians at the Jamestown and Cattaraugus Campus'. The project team found that lab technicians store the chemicals in jars of varying sizes and amounts, and chemicals are disposed of annually or when the storage cabinets become full. JCC then solicits bids for proper disposal of the chemicals. Measurements and records of these chemicals are in Waste Manifest reports that can be obtained from the Director of Buildings and Grounds. Fortunately, the amounts of lab chemicals that can potentially produce GHGs were found to be negligible

and so were not included in the inventory. These chemicals were halogenated hydrocarbons, and less than one pint was disposed of.

Fertilizer Application

Emissions from fertilizer application are based on the nitrogen content of each type and amount of fertilizer used on campus. JCC uses both synthetic and organic fertilizers, each with different nitrogen contents. Figures for the total amounts of organic and inorganic fertilizer purchased, and therefore assumed to be used, were provided by Dave Johnson (North County and Jamestown) and Scott Welka (Cattaraugus County).

Most fertilizers are labeled with their chemical makeup using three numbers to represent the percentages of nitrogen (N), phosphorus (P), and potassium (K). So 15-10-10 fertilizer is 15% nitrogen. Using this percentage, the total N₂O emissions were calculated and converted to MTCO₂e.

Total Fertilizer Emissions = .1 MTCO₂e, accounting for less than 1% of total emissions.

Fertilizer application makes up such a small percentage of total GHG and N₂O emissions, it could be classified as an insignificant source. However, Suny JCC will continue to track fertilizer use, perform soil testing, and conduct natural gardening practices to prevent unnecessary nutrient runoff into the local water supply.

Energy Suppliers

The office of Buildings & Grounds maintains records of the electric and fuel consumptions for the Jamestown, Cattaraugus (Olean), and North County (Dunkirk) campuses. The table below outlines the electricity and natural gas providers for each campus location.

Jamestown	Cattaraugus (Olean)	North County (Dunkirk)
Collegiate Center	The Library & Liberal Arts Center	North Country Training Center
Hultquist Library	The Depot	North County Center
Carnahan Center	College Center	
Physical Education Complex	Cutco Technology Center	
Arts and Science Center	Allied Health & Science Center	
Manufacturing Technology Institute		
President's House		
Sheldon House		
Electric supply - City of Jamestown Board of Public Utilities	Electric supply - National Grid	Electric supply - National Grid
Natural gas - National Fuel Gas	Natural gas - National Fuel	Natural gas - National Fuel

Based on the documents received from the office of Buildings & Grounds, it was determined that JCC uses a total of 7,484,046 kWh of electricity and 352,148 CCF of natural gas.

Natural gas is a scope 1 emission resulting from on-site combustion of the gas which is primarily used for heating. The 352,148 ccf used on campus was converted to MMBtu (million Btu) for entry into the CA_CP calculator.

Scope 2 Emissions Sources

In order to calculate emissions, the project team first identified in which grid region the JCC campuses were located. The CA_CP calculator spreadsheet made this calculation simple and the results are as follows:

Total Purchased Electricity Emissions = 7,484,046 kWh accounting for 30.4% of total emissions.

Purchased electricity is a significant source of the emissions at SUNY JCC. An energy audit was completed for the college by Ecology and Environment, Inc. in the semester prior to this GHG inventory. The energy audit indicated that electronic equipment, lighting and the operation of HVAC equipment were responsible for most energy consumption at the college.

Scope 3 Emissions Sources

Commuting

For many colleges, commuting can be one of the largest sources of emissions. It can also be one of the most difficult sources to measure because commuting patterns are not controlled by the college itself. To gather data on commuting patterns, a survey was created and sent to students, staff, faculty and administration. In an effort to complete the inventory, the survey was sent out at the end of the Spring 2009 semester. As a result, survey respondents were expected to fill out the survey during the summer months. Because the number of respondents to this survey was too low to accurately estimate student commuting, the project team was forced to determine another method of gathering this information. The project team made cold calls to students using a call script based on the original survey (refer to Figure 1 for a copy of this call script). The team reached approximately 13% of the total college population. For future inventories, it is recommended that a respondent rate of 20% be used to accurately portray commuting patterns.

The original survey was sent via the college assigned student email accounts (Gmail). Many students do not utilize this service and so were unaware of the survey. Personal emails are not kept by the college, with the exception of some professors who request these at the start of a semester. It is recommended that future surveys for this inventory be sent via personal emails (if they can be obtained) or by a posting on ANGEL. Most students access ANGEL for school purposes so students are more likely to see the survey and participate. Another option is to

send out the survey during a semester other than the summer semester. Fewer students are active during the summer semester; this is a possible reason for the low number of respondents.

To determine the emissions associated with commuting, the results were tallied, and the following were identified:

1. Average number of trips per week
2. Average distance traveled
3. Average miles per gallon

These numbers were used to convert the total miles traveled into an estimated total gallons of gas used in association with commuting to the various SUNY JCC campuses. These numbers were then calculated in the same way as the vehicle fleet section.

Total Commuting Emissions = 7,660.4 MTCO₂e, accounting for of total of 51.5% of campus emissions.

A commuting and public transportation campaign will be key to reducing the GHG emissions created by student and staff travel to campus. This travel is necessary due to the rural nature of SUNY JCC. New commuting habits will require extensive changes in behavior. SUNY JCC will seek successful models from other community colleges to assist in implementing these changes.

Directly Financed Outsourced Travel

Travel by staff and faculty members at JCC produces a large amount of CO₂ and other GHGs. It was assumed that any travel reimbursed or paid for by the college falls within the ACUPCC mandated ownership boundaries. This includes all travel reimbursement for air travel, personal and rental cars for the 2008 inventory year. The business office keeps a record of all travel reimbursements as it is policy for all travel reimbursed to be reported and authorized by an administrative supervisor.

This section encompasses air, auto and train travel. Auto and air travel emissions are calculated in the same way as the Vehicle Fleet and Commuting sections. . There was no recorded train travel during the 2008 inventory year.

The total auto miles reimbursed by the college equal 93,007.16 miles. The total air miles reimbursed by the college equal 14,104 miles.

Total Directly Financed Outsourced Travel Emissions = 48.5 MTCO₂e for .32 % of total emissions.

Solid Waste

Waste disposal produces methane gas emissions in the decomposition of organic matter. Data on JCC's solid waste disposal was provided courtesy of Westfield Disposal/ Casella Waste Systems contact, Renee Press, servicing the Jamestown and North County campuses and SDS of

Solid Waste Assumptions

When matter decomposes it releases both CO₂ and CH₄. Generally, CO₂ is produced through the decomposition of organic materials derived from biomass sources (e.g., crops, forests). In the U.S. these sources are grown and harvested on a sustainable basis in order to maintain farmers' livelihood. Sustainable harvests imply that photosynthesis (which removes CO₂ from the atmosphere) is equal to decomposition (which adds CO₂ to the atmosphere). As a result, CO₂ emissions from biogas or CH₄ oxidation are not counted in this GHG inventory.

Olean (also an affiliate of Casella) contact servicing the Cattaraugus campus. The College coordinates with each of these sources for pickup of their waste disposal. These companies then measure and record the trash weight. Smaller containers are not weighed by Casella and so solid waste numbers for Jamestown and North County are estimates provided by Casella and based on averages.

The college does not currently record the composition of waste disposed.

The table below lists the solid waste collection company by campus location.

Campus	Collection Company	Amount of Solid Waste
Jamestown	Westfield Disposal	104 tons
Catt County	SDS of Olean	12.5 tons
North County	Westfield Disposal	5.2 tons

Total Solid Waste Emissions = 30.9 MTCO₂e, accounting for less than 1% of total emissions

Offsets

What are Offsets

Offsets are operations or activities that the college undertakes that help or repair the environment as opposed to damaging it. These activities can include land and tree preservation, recycling or investing in clean technologies or sustainable activities whose positive impacts are measurable. JCC does not currently purchase offsets, but they are involved in both recycling and tree preservation.

Recycling

During the 2008 inventory year SUNY JCC was undergoing changes in their pre-existing recycling program. In the future some, if not all, campuses will convert to single-source recycling. When this takes place, the GHG inventory will need to include the amount and composition that is recycled. Recycling does not add to the inventory, but it can be used to offset the amount of solid waste that is disposed of by the college.

Forest Preservation: Tree-Campus USA

The purpose of the Tree-Campus USA program is to establish and sustain healthy community forests for the benefit of current and future residents. It is a program that requires a college or university to complete an inventory of the trees located on a campus and to maintain them. As it relates to this inventory, the Tree-Campus USA program identifies how many trees the college can claim.

As mentioned in the Solid Waste section of this inventory report, photosynthesis removes CO₂ from the atmosphere. When a college chooses to maintain individual trees or a forest, they are effectively offsetting the carbon equivalent that is being emitted into the atmosphere. Unfortunately, at the completion of this inventory, the Tree-Campus USA inventory had not yet been accepted. The project team chose not to include this offset until the inventory was accepted. Therefore, future inventories will show a lower MTCO₂e per student count than during the 2008 inventory year.

Next Steps and Opportunities for Improvement

The creation of a Climate Action Plan or a Plan for Climate Neutrality should be the next task that the college as a whole or the Sustainability Committee undertakes. Based on the results of this inventory, it is recommended that the following be included in this plan:

- An energy policy with an outline for enforcement
- A timeline and plan for running a Transportation Conservation campaign
- A Green Purchasing Policy including purchasing requirements and recommendations
- Plans for a Waste Composition Report to determine possible recycling measures
- A Plan for instituting sustainability education programs or committees

Energy Policy

Having an energy policy will communicate the commitment of your SUNY JCC to the ongoing management of energy. Furthermore the development of an energy policy is a vital stage in identifying where energy management can become more efficient, leading to greater reductions in energy usage and plans for a longer term energy strategy. A key document used in this policy will be the energy audit that was completed for the college in the spring. This document outlines where energy is currently used in excess as well as some options for improvement. Generally a policy should include:

1. **A statement of commitment** from upper management
 - a. this should be signed by a dean or the president of the college
2. **List of objectives** setting out both short and long term aims.
3. **A plan of implementation** detailing how the policy objectives will be met.
4. **Details of everyone's involvement** including a defined role
 - a. this should make everyone's responsibility and involvement clear.
5. **Applicability**
 - a. this defines which parts of the college will be covered by the policy.
6. **Review procedures** setting out when and how progress will be monitored.

Transportation Conservation Campaign

Auto travel emissions sectors make up a significant percentage of GHG emissions at SUNY JCC. Auto travel emissions are also something that the college may not have direct control over. The great thing about running awareness campaigns is that it can be followed by anyone, anywhere, and at anytime. People do not feel forced to comply, but they are given a choice.

Author, Bill McKibbean offers insight on how to successfully push any campaign from its birth to its ultimate success, in his book entitled, *Fight Global Warming Now: The Handbook for Taking Action in Your Community*. It is recommended that a campaign be planned using this or another resource and be included in the Climate Action Plan.

Green Purchasing Policy

Because many people resist change and don't necessarily take into account environmental impact, it's not always the best solution to rely on environmental education. Sometimes policy is necessary to institute change. The following is a sample purchasing policy from the Natural Resources Defense Council. It will have to be detailed and modified to fit in with the culture at SUNY JCC.

This environmental purchasing policy of XYZ Company has been set up to provide guidance in the purchasing of products and services that meet the environmental goals of our company. Purchasing preference (whenever feasible) will be given to products that:

- 1. Cut back on greenhouse gas emissions or are made with renewable energy (i.e. ENERGY STAR computers, hybrid company cars).*
- 2. Decrease the use of toxins detrimental to human health and to the environment.*
- 3. Contain the highest possible percentage of post-consumer recycled content (a finished material that would normally be thrown away as solid waste at the end of its life cycle, and does not include manufacturing or converting wastes).*
- 4. Cut back on air, land, and/or water pollution.*
- 5. Reduce the amount of waste they produce.*
- 6. Are reusable or contain reusable parts (rechargeable batteries, refillable pens, etc.).*
- 7. Are multifunctional (i.e., scanner/copier/printers, multipurpose cleaners) and serve to decrease the total number of products purchased.*

Favor will also be given to suppliers who offer environmentally preferable products, who work to exceed their environmental performance expectations, and who can show documentation of their supply-chain impacts.

Environmentally preferable products and services of similar quality and price to conventional counterparts should gain a purchasing preference. When the greenest option is not available, too costly, or impractical, XYZ Company should look at how the products are produced, as well as the environmentally and socially responsible management practices of suppliers and producers.

The XYZ Company policy of purchasing environmentally preferable products is one element in our continuing, long-range commitment to the environment. By adopting this policy, we hope to likewise engage the producers and suppliers of office products and services we use to utilize business practices that also reduce their impact on the environment.

Waste Composition Report

In order to institute change, the college must first know what to change. A Waste Composition report will identify the types of waste that SUNY JCC disposes. This data can then be used to determine what types of campaigns or reduction strategies might be beneficial for the future. The goal is to continually improve on what has been done in the past

Sustainability Education

SUNY JCC is a community college. As a result, education is best geared towards evening or weekend programs. Student that are attending classes are more likely to focus on their assignments than attend additional seminars or workshops. Unless sustainability is integrated into the curriculum (which is an opportunity in itself) there will be very few interested parties. This is why sustainability education needs to have focus. The college should develop exhibits and communications programs on sustainability topics that integrate environmental, economic and social factors but also pick up on outside interests such as art, movies, travel and awards. In the fall there was a photography exhibit in which sustainability was a secondary focus. This is an example of a successful way to educate on sustainability where it would not normally be found.

In terms of sustainability experts and presenters, the college should identify within their network different people with expertise in areas such as green business, renewable energy, sustainable agriculture and ecoliteracy that provide the depth and experience to clearly explain these topics.

It is also an option to create and give out awards for various sustainability achievements (i.e: Be the Change, Cultivating Sustainability, Sustainability Champion, etc).

Other

Other smaller steps might include the following:

- Research into and consideration of alternative power sources
- Making information about public transportation more accessible on each campus
- Instituting a “walking challenge”
- Involving student senate and other college organizations in coordinating future sustainability efforts (club projects or fundraisers).

List of Abbreviations

ACUPCC – American College & University Presidents Climate Commitment

CA-CP – Clean Air - Cool Planet

CO₂ – Carbon Dioxide

CH₄ – Methane

N₂O – Nitrous Oxide

HFC – Hydro-Fluorocarbon

GHG – Greenhouse Gas

eCO₂ – Carbon Dioxide Equivalents

MTCO₂e – Metric Tons Carbon Dioxide Equivalents

GWP – Global Warming Potential

Btu – British Thermal Unit; the amount of heat required to raise the temperature of 1 pound of water by 1 degree Fahrenheit

MMBtu – One million Btu

One Metric Ton = 1,000 kg or 2,204.62 lbs

Figure 1

Sample Commuter Survey (call script)

Comments reflect the opinions of Cody Norton, Student Intern

Hello, is (STUDENT NAME) there? My name is (FIRST NAME) and I'm calling on behalf of JCC. I've been contacting students from the (ACADEMIC YEAR) school year to see if they'd be willing to just take a really quick, one minute survey with me on the phone?

Survey Key

X – Already took survey

Y – Took Survey

N – Not Interested

W – Wait to call again

I – Invalid Number

1. At which campus were you typically located?

- A. Jamestown
- B. Cattaraugus County
- C. North County
- D. Warren, PA

2. Did you drive a personal vehicle? *(Because the vast majority of respondents drove a personal vehicle, I found it advantageous to ask this first. If they did not drive a personal vehicle, I would then ask whether they carpooled, used public transit, or almost always walked.)*

- A. Drive personal vehicle
- B. Carpool
- C. Public transit
- D. Almost always Walk, Bicycle, Blade, or Board

3. During an average week, how many times would you travel to campus? *(Because going to JCC and returning home is considered to be two trips, remembers to double the answer that the participant gives you. I found it much easier to just double the number myself rather than trying to explain what I meant by "two trips")*

Did you ever carpool? *(If yes, go to italicized questions. If no, skip them.)*

4. How many days a week would you carpool?

5. How many people were in the car on average?

6. On average, how many months per year do you commute in this pattern?

7. What was the approximate one-way length of your commute?

8. Were you required to drive anywhere off campus as a result of any involvement with JCC? (E.g. Clinical for Nursing or Internships)

Y = Yes

N = No

9. In miles per gallon, what is the average fuel economy of the vehicle you used?