Environmental Audit 2014

Mount Allison University

PART ONE: Emissions

May 2014

Environmental Audit 2014

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Preamble & Policy 2102

The audit was carried out according to Mount Allison University's Environmental Policy (2102) Section 5 "Audit and Accountability". The policy dictates that an audit of at least two policy subsections will be carried out every summer by a student of the University. The 2014 audit, carried out in May of 2014, is an appraisal of Policies 2101 (PART ONE: Energy & Emissions) and 2102.c (PART TWO: Waste) and examines progress toward goals set out in the aforementioned policies.

Conducted through a series of interviews with Mount Allison employees and service professionals, analysis of collated data provided by the University, research of external resources and the practices of outside institutions the auditor attempts to adequately and comprehensively measure compliance with and progress toward sustainability goals as outlined in the University policy, and provides recommendations throughout, pertaining both to the progress toward goals and targets, and critique of the policy itself.

Special thanks goes to those in Facilities Management and Financial Services who answered continuous questions and provided me with the documents I needed to carry out this audit, no matter how many emails I might have sent them in a single afternoon. Thanks goes to: Robert McCormack, Perry Eldridge, Matt Estabrooks, Michelle Strain, Chris Milner, Carolyn Richards, Andrea Towers, Phil Cormier, Bart Musgrave, Helmut Becker, Michael Cantwell, Jenna and Tina at Westmorland Albert, Graham Muise, Clara Doucette, J. P. Oulette from NB Power, University Advancement, who housed me for a month, and of course thank you to Robert Inglis who provided priceless guidance, aid and advice throughout the process

Lauren Latour

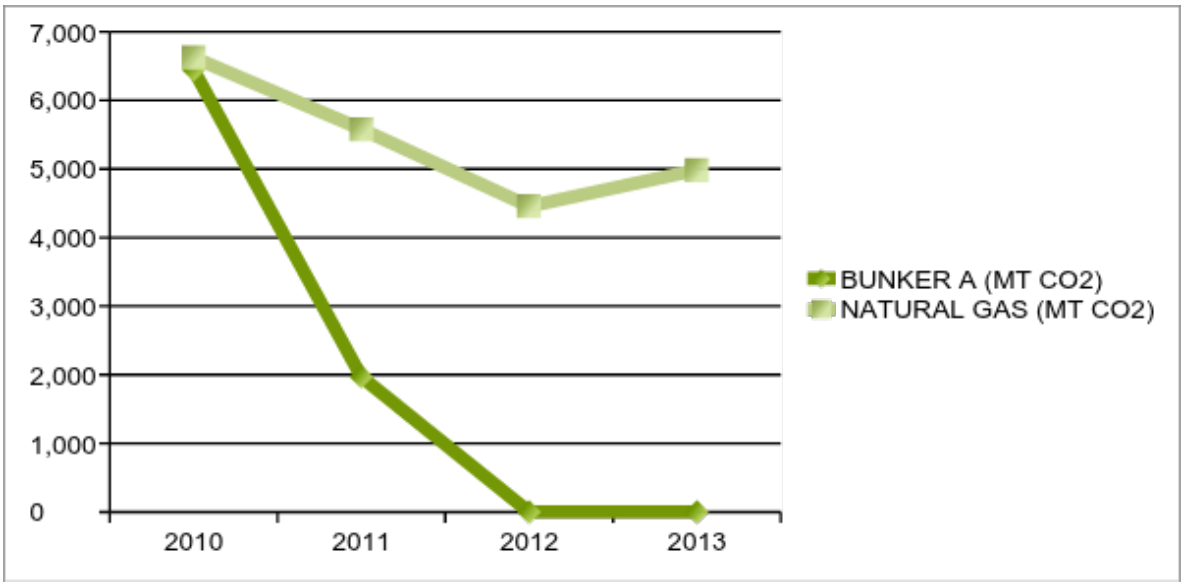
Environmental Audit 2014

Energy & Emissions: Environmental Policy 2101

Heating (2101 2.1)

"The University will make it a priority to decrease emissions resulting from the generation of heat for campus buildings"

Switching to lower emission fuel sources as these become available and represent viable options (2101 2.1)



This chart illustrates the overall decrease in carbon dioxide emissions resulting from heating of campus buildings by almost 2,000 Metric Tonnes from 2010 levels with the conversion of Bunker A to Natural Gas.

Results:

The University has met this clause in primary stages, however, as the number one undergraduate university in Canada (*Macleans*) the institution should always strive to improve upon its own accomplishments. In 2010 the University underwent the process to convert the heating plant from boilers burning Bunker A, to a natural gas system, controlling interior temperatures on campus through steam. Although natural gas is a fossil fuel, the green house gas emissions are considerably less per GJ

than those generated by Bunker A; with the University emitting nearly 2,000 fewer Metric tonnes of carbon dioxide annually since the conversion was first implemented.

Beyond the conversion to natural gas it appears as though serious investigation into alternative heating options has not been conducted, as natural gas is both relatively well priced and has resulted in a comparative decrease in emissions. Further decrease of emissions through alternative heating methods would demonstrate Mount Allison's commitment to decreasing the risk of climate change, beyond cost-effective energy efficiency measures.

Recommendations:

- Specify more clearly what "viable" means in this case. Include a maximum payback period if this applies
- Specify what "lower emission fuel sources" are in comparison to. For the purpose of this audit, it was acknowledged that Natural Gas releases comparatively lower emissions than Bunker A, however, now that natural gas is the new status quo, it is assumed and expected that further improvements can and will be made.
- It is strongly recommend that the University develop an alternative means of heating to supplement natural gas use.
- It is recommended the University convert to a new, more environmentally responsible, and carbon neutral heating source entirely. Bishop's University's geothermal heating system could investigated and perhaps used as inspiration.

A question that has arisen is whether or not methane emissions should be calculated and recorded separately in order to better allow Mount Allison to understand its full environmental footprint. At this point methane emissions are converted and expressed in values of metric tonnes of CO2 for ease of analysis, however, this conversion removes an integral aspect of the role the University plays in climate change. Although the atmospheric lifetime of methane is far shorter than that of carbon dioxide, the EPA states that methane is far more effective at capturing radiation in the short-term, and as a result is

20 times more potent over a 100-year period. Questions surrounding natural gas also surface when procurement of the resource is considered. Although this portion of the audit is dedicated to emissions, the audit is not restricted to these issues alone, and should take all related environmental matters into account. Currently it is assumed that Mount Allison's natural gas comes from offshore wells near Sable Island, NFL. However, the issue remains that should demand for Natural Gas continue to rise (as projections predict) procurement via hydraulic fracturing (fracking) wells in New Brunswick would be a foreseeable next step Although there is much political contention when hydraulic fracturing is discussed, what little research that has been conducted seems to indicate that the practice can have extremely adverse side effects on the ecosystem the well has been built within.

Despite new findings in the *Journal of Geophysical Research: Atmospheres* and in the *Proceedings of the National Academy of Sciences*, Mount Allison's CH4 to C02 conversions remain up-to-date and accurate, as conversions are calculated using the "Clean Air, Cool Planet" calculator, a database with frequently updated metrics.

The reader should be informed that Mount Allison is charged for Natural Gas based on the Boston, U.S. market. Predicted rising prices due to increased Boston area demands coupled with underestimated emissions risks and environmental issues associated with natural gas procurement require a very strong recommendation that alternatives for heating are earnestly investigated and used to supplement Mount Allison's heating energy requirements. In recently released reports (published in the *Journal of Geophysical Research: Atmospheres* and in the *Proceedings of the National Academy of Sciences*) findings in both Colorado and Pennsylvania found that amounts of methane per square kilometer were far above what the EPA had initially estimated. After accounting for pollution generated by "landfills, water treatment and cattle operations, the scientists concluded that emissions from drilling were close to three times higher than an hourly emission estimate published by the EPA." This is due in large part to methane leakage from drilling operations and pipelines. These new findings are extremely troublesome and this new information should be seen as a warning, and call to search for less carbon-intensive heating alternatives, perhaps similar to fellow U4 member Bishop's University's recent geothermal heating development.

Implementing energy efficiency measures within University renovation projects (2101 2.1)

Results:

BLAC-10-02	Black House Renovation
BENN-10-01	Interior Renovation Project
BENN-13-01	Bennett Bigelow Interior/Exterior Reno Phase II
JENN-12-01	Jennings Upgrades Phase II

The above four projects were randomly selected for the purpose of the audit to see how often energy efficient measures are implemented within renovation projects on campus. Of the above four sample projects, all four has energy efficient measures implemented, ranging from LED lighting and insulation upgrades in Black House and Bennett, to secondary doors and a vestibule built onto the front of Bennett and Bigelow houses to aid in temperature control. The Jennings Upgrades were carried out after an energy audit of the building was conducted, and as a result was made up of entirely energy efficiency measures. The sample size, albeit small, displays a trend of follow through and adherence to this particular clause by facilities management.

Recommendations:

- Individual building Energy Audits are frequently conducted prior to renovations on campus. The University should implement Energy Audits for all buildings which have not already been audited, in order to provide Facilities Management with a clear idea of upgrades to be made to lessen the energy required to operate buildings on campus.
- In order to carry out Energy Audits and continue to implement energy-saving measures on campus the Green Evolving Fund should be re-instated to provide resources and encourage energy-saving means for the sake of environmental responsibility, not merely as a means of saving money.
- Seek funding from the Internal Loans program for projects under $500,000 with a relatively low payback period.

Using alternative energy sources where these sources are appropriate in building construction, maintenance and renovation (2101 2.1)

Results:

Although alternative energy measures have been seriously investigated in the past, alternative energy projects have never been implemented at Mount Allison, with cost being cited as the primary challenge to overcome. In the past geothermal has been explored, with Jennings meal hall being considered as a site for heating, however, price paybacks proved to be far too far reaching. Solar and wind energy have

not been seriously examined recently, as they are typically thought to be underdeveloped means of energy generation.

Recommendations:

- It is strongly recommended that the University more actively and earnestly investigate alternative energy for Mount Allison, with the goal ultimately being implementation or sourcing of alternative energy in the near future.
- Re-instate the Green Evolving Fund to aid in the development of alternative energy projects on campus
- Actively fundraise through University Advancement to support sourcing of alternative energy

Pursuing Green Globe certification for all major renovation and construction projects (2101 2.1)

Results:

The University has worked to achieve high Green Globes ratings for some, but not all of its major construction and renovation projects. The Wallace McCain Student Centre has achieved a standing of 3 Globes respectively, while the Fitness Centre within the WMSC has a rating of 4 on its own. The new Purdy Crawford Centre for the Arts, which opens in the fall of 2014 is expected to achieve a rating of 4 Green Globes, however, the exact number will not be confirmed until after this audit is complete. The only major construction projects which have not pursued Green Globes on campus have been the recent renovation of Black House and the Bennett/ Bigelow residences, as the projects were deemed too small to warrant the relatively expensive Green Globes certification

Recommendations:

- Specify which level (number) of Green Globes Certification the University will consistently aim for

- Establish a minimum project size for Green Globes certification (by dollar amount)
- Evaluate if Green Globes is truly the University's best means of measuring the environmental impact of a building

Working with students & employees to reduce ambient room temperature in buildings (2101 2.1)

Results:

By and large, efforts to reduce ambient room temperature are controlled by Facilities Management. Room temperatures are turned up during the day to accommodate occupation, and once buildings are closed at the end of the day, temperatures drop to conserve energy. Room for improvement exists in those residences like Campbell and Bennett/Bigelow, which allow for individual room temperature control, as opposed to other residences which only allow for vents to be opened and closed according to desired temperature. Facilities Management recognizes the need for monitoring of both residence and academic buildings in order to facilitate energy reduction through behavioural change, and through constant monitoring of any operational issues. In the past there has been an effort to employ EcoReps within residences to help with building monitoring and reporting, however, recent efforts have fallen short. The summer of 2014 is anticipated to bring change, as Facilities Management is coordinating a team of employees and students to function as EcoReps, monitoring behaviour and operations of all campus buildings, ensuring efforts are made not to waste energy in any capacity, and to encourage those people who pass through that building to be more mindful of their energy use within that space.

Recommendations:

- Frequently assess the EcoRep program for achievements, challenges and ways to improve and perpetuate this very important program
- Provide visual aids throughout the University around the time of the EcoRep program implementation. If measurements of energy use and emissions resulting from heating each building could be compiled into a graph, it might be an effective means of showcasing the environmental footprint of the campus, and hopefully generate a sense of competition

Electricity (2101 2.2)

"The University will make it a priority to decrease emissions through a reduction of the use of fossil fuel sourced electricity."

Purchasing green power through the New Brunswick power grid as it becomes available and represents a viable option (2101 2.2)

Results:

Currently, the only means of purchasing green power through NB Power is by generating it privately and selling that energy back to the grid. This presents issues on many levels, the primary problem being that of cost. Developing a means of generating Mount Allison's energy on campus, although doable through NB Power's Embedded Generation and Net Metering programs, would be extremely costly and time consuming, requiring months or years of consulting, planning and construction. In the past projects of this sort have been considered, however these projects have all been abandoned, with cost being cited as the primary reason.

Recommendation:

- Specify more clearly what "viable" means in this case. Include maximum payback periods, or costs if they are applicable.
- Specify what "green" power is defined as (for instance, is nuclear power considered "green" by these standards because it does not emit GHGs?)
- Re-establish the Green Evolving Fund to support energy-generating projects; without the GEF, there is little chance that Mount Allison will acquire the funding necessary to develop a large project to generate green power.
- Seek funding from the Internal Loans program for projects under $500,000 with a relatively low payback period.
- Work with University Advancement to fundraise for such initiatives

According to a calculator provided by the American EPA, Mount Allison would require 1.2 wind turbines at 1. 94 MW to cover its power needs (using 2013 levels).

- Generate renewable energy on campus. NB power does not provide the option of acquiring power from only renewables, therefore Mount Allison's only means of fulfilling this clause is through partnering with NB Power and its Embedded Generation or Net Metering programs and generating its own energy
- Look to other universities for inspiration:
    - U4 institution Bishop's University recently implemented the only Geothermal District heating system in Canada, reducing their GHG emissions by 62% and is producing an annual savings of $325,000.
    - Bowdoin college, a liberal arts university in Maine has a student body of 1,770 and a carbon footprint similar to MTA's at 14, 920 MT. The college has plans to construct 3 acres of solar photovoltaic panels in 2014.

Retrofitting buildings with energy efficient lighting and motion sensor/timer/volt or power miser technology wherever it is reasonable to do so (2101 2.2)

Results:

This process is ongoing and constant, with lighting options always being considered whenever lights burn out or need to be replaced for an alternative reason. Currently nearly all lights on campus are fluorescent (T5) or LED, with the new Purdy Crawford Centre for the Arts being entirely lit by LEDs. Motion sensors are also being installed across campus more frequently, and are always being considered for installation, with Campbell Hall's common area lights being entirely connected to motion sensors. Where issues do arise is in the coupled implementation of fluorescent bulbs and motion sensors. While fluorescent bulbs do require less energy than incandescent bulbs and boast a longer lifetime, they are composed of extremely dangerous chemicals, including mercury, and wear out far faster if frequently turned on and off, which can sometimes be the case with motion sensor systems.

Recommendation:

- LEDs should be installed in favour of fluorescents as their lifetime is longer, they lack the dangerous chemicals fluorescents do, they require less energy and less maintenance over time.
- The statement "reasonable to do so" is ambiguous in nature; the clause should be rephrased to reflect a specific timeline, expectation, price, etc. in order to ensure action is taken to convert lighting options to those which aid in energy conservation in a timely manner.

Purchasing high efficiency model appliances and computer hardware (2101 2.2)

Results:

When the decision is made by a given department to purchase computers or appliances, purchases must first be approved by Computing Services or Facilities Management, respectively, before finally being passed along to Procurement for the last stages of decision-making and purchasing. Both Facilities Management and Computing Services consider energy use when making decisions regarding products, however, as computers generally run very efficiently, and Mount Allison purchases exclusively from Dell and Apple, the process is primarily concerned with cost-effectiveness. It should also be noted that this process is carried out largely out of individual practice and is not necessarily mandated in a purchasing policy beyond this single clause in the Environmental Policy. When larger acquisitions are carried out, typically companies will bid for the opportunity to have Mount Allison as a customer. When this is the case, (as is the case with larger equipment in sciences, for example) applicants are required to consider environmental effects in their application, being mandated to provide evidence that the company in question has considered and addressed the environmental impact of the product at all stages of the lifespan of the good.

Recommendation:

- "High efficiency" should be defined more precisely, and specified under a certification if this is what policy writers had in mind. As it is, this clause is very ambiguous and can be subject to personal opinion and desire.

- The University's Procurement Policy (7101 subsection 8-Environmentally Aware Procurement,) should be expanded to reiterate the necessity of purchasing items which require lower energy use. Stressing the importance of low energy appliances is of great importance in ensuring these policies are adhered to and these issues taken into account throughout different employees and changing cultural sentiments.

Working with students and employees to reduce their use of electricity. (2101 2.2)

Results:

The response to this clause has been largely similar to the response seen to a subsection of Heating which dictates the collaboration of students and employees to reduce ambient room temperature in buildings. With the exception of the Campus Climate Challenge, which has always been successful in residence buildings, efforts to encourage and facilitate student and employee behavioural change have been lacking. EcoReps have always been employed in residences, though as of late their responsibilities are limited to waste sorting and collection and the promotion of C3. As mentioned previously in the audit, Facilities Management is redesigning the EcoRep program during the summer of 2014, and expectations are high. The new program will include students and staff, and encompass all campus buildings, not being limited to residences as before. The EcoReps will be responsible for monitoring energy use in a given building, as it results from human action or inaction. The EcoRep will report any operational issues to Facilities Management, allowing for increased and more frequent response to energy-intensive malfunctions (leaking windows, faulty ventilators, etc.) The EcoReps will also be on hand to encourage simple actions by the campus community, for instance, ensuring lights and computers are off when rooms are not in use, and spot ventilators are not left on in laboratories

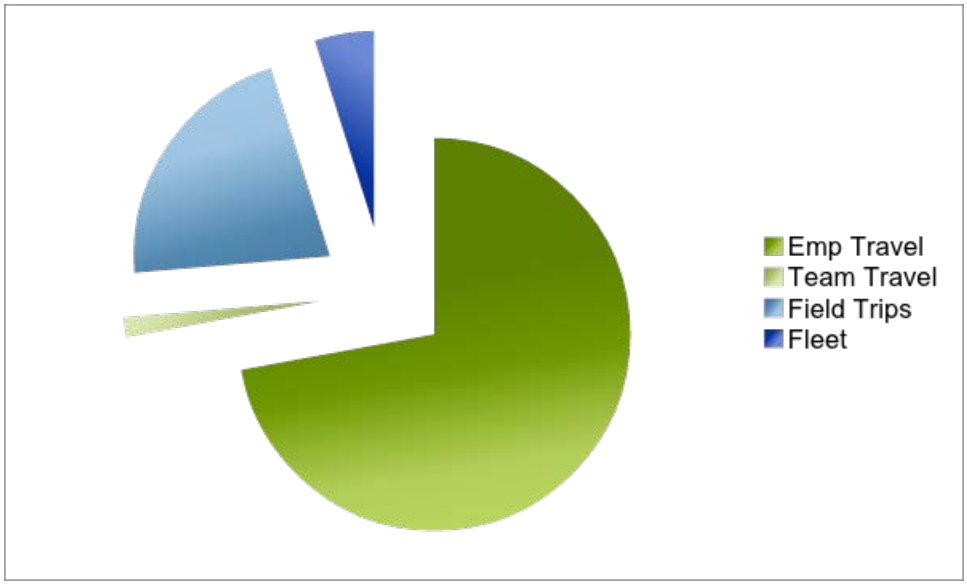
Recommendation:

- Frequently assess the EcoRep program for achievements, challenges and ways to improve and perpetuate this very important program
- visual aids be utilized to encourage personal change. Data telling the story of MTA's carbon emissions and energy use is available in abundance, and providing this information to the student

and staff community through posters and digital signage may be an effective means of conveying information and encouraging individuals to find out how they contribute to the greater University impact.

Transportation (2101 2.3)

"The University will make it a priority to decrease emissions resulting from University-owned vehicles and University- approved travel."



The chart illustrates the division of emissions resulting from transportation in 2013

Employee Travel: 72%, Team Travel: 2%, Field Trips: 21%, Fleet: 5%

Reducing the number of university-owned vehicles where it is appropriate to do so (2101 2.3)

Results:

Strictly speaking, the size of the University fleet has not been reduced, with numbers having slightly increased with replacement of 1 truck by 3 electric gators, however, these non fossil-fuel emitting vehicles do demonstrate a dedication to emissions reduction. Thoughts of reducing fleet size have been

discussed and considered by those in Facilities Management, which owns the vast majority of University vehicles (the science department also has a small number of vehicles), however, difficulties arise with the perceived necessity of those vehicles. Cultural change has been cited as an obstacle to overcome; before vehicle numbers are reduced, first employees will have to become comfortable with the idea of sharing vehicles in some capacity. One interviewee has spoken about the structure of Facilities Management, and why this might ultimately hinder fleet reduction. Because vehicle purchasing, and the vehicles themselves are separated by individual Facilities Management department, it is difficult to make general mandates without individual department follow-through and attention being paid to the requirements of each department.

Recommendations:

- A timeline and/or number of vehicles the fleet should be reduced to or by (perhaps per department) should be specified
- Each individual Facilities Management department head should be met with to determine individual department needs
- strategies should be developed to gradually reduce the number of vehicles Facilities Management operates,
    - Could perhaps be achieved with departments sharing vehicles if feasible
    - Trading those remaining vehicles in for electric options, only keeping combustion-engine vehicles for those duties which require exceptional power, or road-capable vehicles.

Replacing the existing fleet with low emission, alternative-fuel vehicles where it is appropriate to do so.

(2101 2.3)

Results:

In 2013, the Carpentry & Paint department chose to give one van to the grounds department which was in need of a vehicle. This van was then replaced with 3 electric gators, leaving the department with one truck for municipal road travel, and the three electric utility vehicles for general use and transport of

materials. Although the option was presented to have one of the three electric cars charged by solar panel, this option was ultimately eschewed to save cost. The adoption of electric or hybrid trucks and vans had been rejected up until this point, largely as a result of cost and the need for high-powered vehicles for grounds maintenance. Currently requests for new vehicles are placed by department managers, which are then passed on to those in procurement via Robert McCormack, the Director of Facilities Management. Because requests are put forth by individual managers, by and large the vehicles are chosen by those individuals, subject to what the manager sees as appropriate and based on factors they see to be of priority. As of yet the only electric vehicles purchased have been those in the Carpentry & Paint department, following the department manager's analysis of Acadia University's model of vehicle use. Thus far the new electric utility vehicles and the system upon which their use is based has proven to be effective and cost efficient.

Recommendations:

- A timeline or target date should be provided, along with the number or percent of fleet vehicles which should operate on alternative fuels, produce lower emissions, etc.
- Existing diesel vehicles, or those purchased in the future be converted to run off of used cooking oil from Jennings Meal Hall, Gracie's and other Sackville establishments.
- Determine how many road capable vehicles are truly necessary for each department, and of those, which could be shared within Facilities Management. Those vehicles which are not required to be road-capable should be traded for electric utility vehicles as the opportunity arises, preferably on a shorter time scale.
- Research, and have an ongoing list of electric vehicles which could be used for Facilities Management operations, and continue to revisit this list as electric vehicle prices are reduced.

Implementing a central accounting system that monitors travel distances and mode of all university travel

(2101 2.3)

Results:

Travel data has been collected and analyzed for several years now, and although the system does not record distances travelled, it organizes all travel by nation visited, means of transportation, and the carbon emissions of that trip. Final data for each year is then collated into a document highlighting which nations the University emits the most carbon dioxide travelling to. The data collected is extremely informative and could be very effective in enacting change if utilized properly. The large bulk of travel related emissions result from air travel within North America. In 2013, these emissions accounted for over half of Mount Allison's overall travel emissions. In many ways this is good news, because it means that these emissions can be reduced considerably simply by encouraging employees to travel by train, car or bus whenever possible. It should also be noted that travel emissions have reduced considerably when comparing the 2012/2013 year to 2011/2012, with emissions being reduced by almost 700 metric tonnes. This reduction was primarily due to a reduction in Canadian travel; and although it is unknown exactly why this reduction has occurred, it might perhaps be accredited to the increased use of video-conferencing now available in Bennett, a service which has seen increased use in recent years, especially by departments interviewing for position openings.

Recommendations:

Those in financial services, Carolyn Richards in particular have done extremely well collecting, calculating and archiving travel data completely and comprehensively. The system currently in place is to be commended. It is recommended that the process of data collection continue much as it has in the past, with recommended changes primarily being what is done with the data once it is collated; these recommendations will be discussed in the final travel subsection, discussing working with students and employees to consider their travel habits.

Working with students and employees to consider their use of University approved travel (2101 2.3)

Results:

Up until now, the clause has been largely untouched, as behavioural change is extremely difficult to coordinate and effectively activate. Due to the decentralized nature of the issue, it has been difficult to evaluate. It can be seen from records of university- approved travel that there has been little success in employees and students reducing their travel emissions, however, it appears as though little effort has been made to encourage such behavioural change, aside from video-conferencing being utilized for long distance meetings and interviews when appropriate. Efforts have also been made to amalgamate athletic team travel when the opportunity allows, with Mount Allison teams sharing buses with other Mount Allison and Atlantic University teams. As the chart on page 12 shows, the vast majority of transportation related emissions result from University employee and field trip travel. This presents an issue unique to the university education system; in order for professors to properly educate students, research must be carried out, which can take individuals to countries and continents across the globe. The same concept applies to students and field trips; for instance, the Geography and Environment department (which takes issues of sustainability very seriously) travels with some 24 students to Jasper National Park every summer to allow students the ability to conduct their own independent research in the field. These experiences are of the utmost importance to the education of students and the integrity of Mount Allison University, and as a result cannot be easily avoided; alternative means of reducing these emissions must be investigated.

Recommendations:

- data might be organized based on department and faculty, to inform departments of the size of their particular travel carbon footprint.
- When Financial Services develops its list of local bus services, those bus lines which operate more fuel efficient buses should be identified, so they might be utilized more frequently.

- When field trips are taken over farther land-based distances, it would be beneficial for those classes to travel by rail instead of renting a series of vans, as rail travel is one of the less carbon-intensive means of travel available, and through CAUBO Mount Allison approved travellers receive 10% off
- Individual team footprints might be collected and presented, allowing teams to understand their impact, in hopes that they might consider the environmental (and financial) benefits of vehicle sharing
- An individual should be dedicated to coordinate such efforts, and to develop new ways of engaging the Mount Allison community and reduce travel emissions through behavioural change.
- Mount Allison should develop its own carbon offset program. A budget could be designed, built largely on carbon offset funds, to finance more ambitious carbon emission reducing projects than those which have been implemented up until now. It is through this model that a Green Evolving Fund could be re-instituted and supported.

Staff and Student Commuting

Although currently measured and calculated, emissions resulting from student and employee commuting are not included in the University carbon footprint or Environmental Policy. Although these emissions are largely beyond the control of Mount Allison, the University could play a role in encouraging behavioural change. It is recommended that the University take initiative on the issue, perhaps publicizing and developing a car-pooling campaign, event or webpage to aid in coordination of drivers and riders and encourage exploration of alternative means of transport.

Finance (2101 3)

All renovations and new buildings incorporate alternative energy or highly efficient construction techniques

Results:

Although renovations and new buildings have not incorporated alternative energy to this date, it has been reported that all construction techniques utilized are as efficient as possible, as efficiency is not only what is typically best for the environment, but also for economic purposes.

Recommendations:

- The university should strive towards incorporation of alternative energy in all new buildings, renovations and across campus
- Consider rephrasing this clause, or defining what is meant by "highly efficient construction techniques" this phrase reads as though it only pertains to the construction process, which "all renovations and new buildings incorporate alternative energy" seems to refer to the buildings themselves.
- Confirm that "highly efficient construction" does in fact refer to highly energy efficient construction, as efficiency means many things to many people depending on where their preoccupations lie.

Continued efforts at fundraising for building renewal/renovation and deferred maintenance to lessen energy consumption (2101 3)

Results:

This clause has been largely unmet. The last major attempt to garner donations specifically to lessen energy consumption was the "Greening of Mount Allison" campaign, almost a decade ago as part of the JUMP campaign. The "Greening of Mount Allison" campaign itself was unsuccessful, bringing in little money, and currently there are no scheduled attempts by University Advancement to raise money for environmentally responsible projects or those with energy reduction specifically in mind. This lack of success is thought to perhaps stem from a lack of structure and planning for the fund itself. It is believed that donors were not provided with clear goals or project ideas for the fund, which might have deterred donations. However, money has been raised for projects such as the Purdy Crawford Arts Centre, which of course incorporates energy saving measures, but funds were not raised to be devoted specifically to an environmental cause. There was an effort made by University Advancement to fundraise for environmental education when the Montreal Based EcoFoundation was approached and provided two payments of $15,000 to Dr. Brad Walters for his Environmental Activism course. The funds have gone to support numerous students attending conferences, protests and meetings, in addition to funding individual student activist projects and a Teaching Assistant for the course.

Recommendations:

- An ongoing campaign should be developed and launched through University Advancement to fundraise for projects which lessen energy consumption, offset carbon emissions, develop energy generating projects, reduce carbon emissions, etc.
- This clause should be elaborated upon to include fundraisers not just for building construction, but also to include projects which would offset carbon emissions, develop energy generating projects, reduce carbon emissions, etc.
- Clear projects, targets, timelines and goals should be planned to aid in fundraising and provide donators with assurance that their money is being well spent

Establish a Green Evolving Fund using the savings that result from such projects. (2101 3)

Results:

In May of 2010 Mount Allison implemented the Green Evolving Fund, designed as the policy required, using the savings resulting from building renewal and renovation projects, and applying them to exclusively fund energy efficiency and environmentally responsible projects. The fund operated for approximately three years, funding several projects including the Library Energy Management System, re-commissioning the WMSC, lighting retrofits and even the installation of Dyson Airblade hand-dryers in the student centre washrooms. Although there were many issues surrounding the Green Evolving Fund, it generated an exceptional amount of money far faster than had been expected, with upwards of $800,000 in the fund after three years of operations. The 2013/2014 academic year brought with it financial difficulty as a result of enrollment dropping by approximately 100 students. Upon further investigation, discrepancies arise in the reasons cited for the ultimate cancellation of the fund. Although all agree that the primary cause is the financial shortage resulting from low enrollment, the fund itself was reduced several months prior to students enrolling by several hundred thousand dollars. Lack of economically feasible projects has been reasoned, as has a lack of administrative and planning resources,

ultimately the reasons for cancellation of the fund are complex and nuanced, and demand further explanation.

Recommendations:

- In order to comply with the University's Environmental Policy the fund should be re-instated.

  Although resources remain in some capacity to fund energy saving projects upon application, the pay-back period required of those projects is comparably low when it is considered that many of the "low hanging fruit" projects with short payback periods have already been implemented. The Green Evolving Fund was an excellent means of Mount Allison demonstrating and acting upon its dedication to maintaining environmental integrity and supporting future generations of Mounties with a more secure climate. The existence of the fund required constant project development, solely for the purpose of reducing energy use and resulting emissions. Although energy use and emissions are certainly a priority in new project development, it (reasonably) takes a back seat to maintenance, innovation and financial responsibility on campus. The Green Evolving Fund provided Mount Allison with the means to dream bigger and work more vigorously towards a sustainable campus and a sustainable future.

- Consider development of a Mount Allison- based carbon offset program for travel emissions to supplement the Green Evolving Fund

- An alternative to the Green Evolving Fund is to encourage use of the Internal Loans program as dictated in policy 8901 "Authorization for Borrowing"

  Facilities Management with help from a small committee of students could help to develop an annual list of potential projects for the university to implement, focusing on those projects which reduce energy use and emissions, yet have a relatively small payback period,

Performance Indicators, Accountability, Targets (2101 4)

"The Controller will collect information and report metrics and progress on emission reduction in the annual Review of Operations. The metrics to be considered for inclusion are:"

- Fossil fuel use and emissions from fossil fuels consumed for heating purposes
- Electricity use and emissions from annual electricity consumption
- Emissions from University approved travel
- Energy Consumption and emissions per square foot
- Energy consumption and emissions per student and per employee

Although all of the aforementioned information is readily available, not all information has been included in the Controller's annual report, simply because to do so would require a far more extensive document. What has been suggested by the Controller, and supported in the audit is the inclusion of a link to Mount Allison's environment page, which will include a brief summary of the above information, so that it might be more readily available to the general public, as well as to those who have access to the Controller's report and would like further detail. The single page document can be found in Appendix D of this report.

The New England Governor's and Eastern Canadian Premier's Conference Climate Change Plan.

In 2005 Mount Allison signed on to the New England Governor's and Eastern Canadian Premier's Conference Climate Change Plan, a pledge taken by politicians and University Presidents alike, pledging to return to 1990 GHG by 2010 regionally, a further reduction of 10% vs. 1990 levels by 2020, and to reduce emissions by 75-85% below 2001 levels by 2050. Until 2013 these goals were still being pursued, until recently, when the Climate Change plan was not renewed. The plan is being addressed and rewritten by an American committee governing both Energy and Emissions in the private and public sector. A new document with new targets for 2025 and 2050 is currently being developed and will be proposed again in the future.

"The University will…"

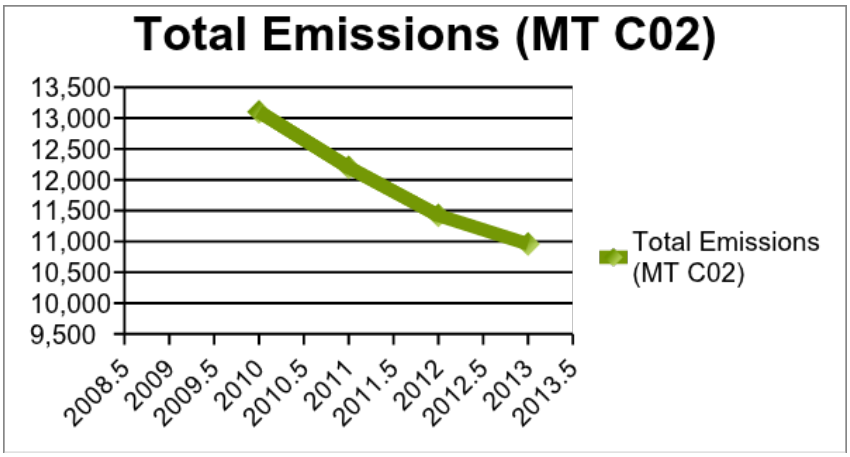
- Establish a baseline by April 30, 2010 for indicators noted above
- Establish interim targets by December 31, 2010 for goals and actions for 2012, 2015, 2020 and other years to 2039

Although a baseline of 2010 values has been established, and emission reduction targets researched and collated, (see Appendices) these targets have not been developed into clear, mandated goals for each of the required years[1]. Actions to achieve those goals also have been researched, but not yet approved, accepted and mandated. It is strongly recommended that this portion of the policy requirements be completed according to the above clauses, using information already largely at hand to develop a carbon emissions reduction strategy with specific goals and actions for each of the specified years. This document should be drafted in a timely manner, and moved to the Environmental Issues Committee for approval immediately following. Ideally the strategy should be adopted and mandated within the first weeks of September 2014. A sample document is attached in the appendices for review.

Primary Energy/ Emissions Recommendations

Overall, Mount Allison's carbon dioxide emissions have experienced a steady downward trend over the last four years. However, it is too early to say if this is a trend the University will maintain, although ample resources exist to continue this downward trend, and improve MTA's emissions output over time.

[1] *Previously drafted targets can be found in the appendices.*



Although recommendations have been made throughout the report, this should be considered an overall summation recommendations.

- Consider rephrasing language of policy clauses to reflect commitment to sustainability and to encourage more active, frequent action. Remove or rephrase qualifiers like “wherever it is reasonable to do so” and “if economically feasible.” These clause qualifiers appear to make Mount Allison’s commitment to environmental sustainability and responsibility a priority ranking below convenience and finances.

- Quantifiers should be added to all clauses: dates, specific targets, maximum/minimum payback periods, etc.

- University should be calculating methane and nitrous oxide emissions as well, especially as methane is the primary green house gas emitted from Natural Gas, which is our sole heating source. STARS and the Clean Air Cool Planet measures require/allow for methane, nitrous oxide and other GHGs to be calculated and included. Methane in particular is extremely potent, some 20times more potent than CO2 over a 100 year period, and is taken very seriously for its warming and radiation capturing potential.

- If we are going to continue to convert methane to CO2 for the sake of simplicity, it must be ensured that up-to-date conversion calculations and equivalency values are used.

- Overall, language and enforcement must be considered more closely and perhaps require reworking of the policy, as many environmentally responsible or energy conscious process are carried out more out of practice than as a result of policy, or with mind consciously being paid to environmental policy. While this reflects well on the employees of Mount Allison and certainly helps to perpetuate a culture of sustainability on campus, risk arises when loss of those employees in question is discussed. If environmental responsibility is not very specifically mandated in policy, monitored and enforced. Hope for carrying out these actions onto the next generation of employees wanes.

- Care should be taken to encourage a culture of sustainability on campus, which currently is the fringe, and not widely discussed, appreciated or taken seriously

- Develop a sustainability strategy for Mount Allison, taking into account past audit recommendations. Within this strategy could be included goals for carbon emission reductions and actions which could help Mount Allison achieve those goals. A strategy would help institutionalize the recommendations made in past audits, and help to establish a strong commitment to the reducing the environmental footprint of the University, while helping to encourage a culture of sustainability on campus, whereby environmental responsibility is part of everyday activities for all members of the Mount Allison community

Appendices

Appendix A. Environmental Policy 2102

Policy #: 2102

Subject: **Environmental Policy**

Group: Institutional

Approved by: Executive Committee

Approval date: May 11, 1999

Effective date: May 11, 1999

Revised: April 20, 2012

Administered by: Vice-President (Administration)

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1. PREAMBLE

Mount Allison University's mission is to provide a rigorous liberal education of high quality primarily to undergraduate students.

Because the University is a perpetual and endowed institution, it must be even-handed between the current and future generations. Therefore it must protect the interests of the current generation by operating as efficiently as it reasonably can and by providing a healthy environment for its students, faculty and staff, and it must protect the interests of future generations by operating in a sustainable manner.

Because the University operates in a local and global context, it must also consider the impact it has on others, including its impact on future generations.

For these reasons, Mount Allison seeks to improve its efficiency and to minimise its negative impact on the environment through a program of continual improvement in environmental performance. This will be achieved by implementing a feasible and comprehensive environmental policy with measurable and achievable metrics as set out in its sub policies. Compliance with, and progress towards metrics set out in, the sub-policies is the responsibility of the applicable University departments who are accountable to their respective vice-presidents.

2. POLICY

This policy is structured into eight areas: Emission Reduction, Transportation, Water, Waste, Food, Paper, Grounds and Buildings.

The performance indicators and metrics associated with each area will serve as standards, and progress in meeting these standards will be measured through an independent audit process.

2.1 Emission Reduction

The University will endeavour to minimize energy consumption and emissions emanating from heating, electrical consumption and University approved travel and vehicle use as set out in its Emission Reduction Policy.

2.2 Transportation

The University will endeavour to minimise energy consumption and encourage less carbon intensive means of transportation as set out in its Transportation Policy.

2.3 Water

The University will endeavour to use water responsibly as set out in its Water Policy.

2.4 Waste

The University will endeavour to minimize solid waste production and to recycle and divert as much waste as possible as set out in its Waste Policy.

In accordance with that Policy the University will also monitor the use and disposal of hazardous materials.

2.5 Food

The University will endeavour to minimize the ecological impact of food consumption and food waste on campus as set out in its Food Policy.

2.6 Paper

The University will endeavour to minimize the use of paper and paper products as outlined in the Paper Policy and encourage responsible, environmentally-aware paper procurement consistent with the University's Procurement Policy.

2.7 Grounds

The University will endeavour minimize the ecological impact of its grounds maintenance program as set out in its Grounds Policy.

2.8 Buildings

The University will endeavour to minimize the ecological impact of the construction, maintenance and operation of its buildings as set out in its Buildings Policy.

3. ENVIRONMENTAL ISSUES COMMITTEE MEMBERSHIP

The Environmental Issues Committee will have the following membership:

- Three administrative members appointed by the Vice President, Administration;
- Three faculty members appointed by the Provost and Vice President, Academic & Research;
- One community member appointed by the Vice President, Advancement;
- Five students appointed by the Students' Administrative Council; and
- A chair appointed by the President.

4. ENVIRONMENTAL ISSUES COMMITTEE MANDATE

The mandate of the Committee will be as follows:

i. to educate members of the University community on environmental issues and initiatives;

ii. to foster co-operation and facilitate communication between the University and the broader community concerning environmental matters of mutual interest;

iii. to foster co-operation and facilitate communication with other universities concerning environmental initiatives so that all institutions will benefit from environmental progress made at any one institution;

iv. to highlight to the community those courses and other educational opportunities that focus on environmental matters;

v. at least once every three years to review and to either recommend to the President amendments to the Environmental Policy and its sub policies or recommend that they be confirmed;

vi. to review and to report to the President on the results of the annual audit completed under this policy; and

vii. to report to the President on any other matter on which it considers it appropriate to report.

5. AUDIT AND ACCOUNTABILITY

Each summer the University will complete an audit of its compliance with, and the progress made towards goals set out in, at least two of the sub-policies under this Policy, which audit may include criteria from external bodies such as Stars, ISO14000 or others. It is expected the audit will usually be completed by a student.

This Policy and related sub-Policies will be included in the University's annual legal, regulatory and policy compliance report to the University's Audit Committee.

Appendix B. Emissions Policy 2101

Policy #:	2101
Subject:	Emission Reduction
Group:	Institutional
Approved by:	The President
Approval date:	April 28, 2009
Effective date:	April 28, 2009
Revised:	
Administered by:	Vice-President, Administration

1 - Purpose
Mount Allison has a strong tradition of innovation and leadership on environmental issues. However, the current state of the climate crisis demands that the University build on this tradition to reduce its carbon footprint. Doing this will pose unique challenges that will require an unprecedented degree of commitment and cooperation by the University community. The purpose of this policy is to provide guidance and direction to address these challenges and to establish Mount Allison as one of North America's leading universities in carbon reduction.

2 – Policy
It is the University's policy to concentrate its efforts in the three major areas responsible for most of the University's emissions: Heating, Electricity and Transportation.

2.1 Heating

The University will make it a priority to decrease emissions resulting from the generation of heat for campus buildings. Strategies are to include:

- Switching to lower emission fuel sources (e.g. natural gas, biomass) as these become available and represent viable options;
- Implementing energy efficiency measures within University renovation projects;
- Using alternative energy sources (e.g. geothermal, passive solar) where these sources are appropriate in building construction, maintenance and renovation;
- Pursuing Green Globe certification for all major renovation and construction projects; and
- Working with students and employees to reduce the ambient temperature of buildings.

2.2 Electricity
The University will make it a priority to decrease emissions through a reduction of the use of fossil fuel sourced electricity. Strategies are to include:

- Purchasing green power through the New Brunswick power grid as it becomes available and represents a viable option;
- Retrofitting buildings with energy efficient lighting and motion sensor/timer/volt or power miser technology wherever it is reasonable to do so;
- Purchasing high efficiency model appliances and computer hardware; and
- Working with students and employees to reduce their use of electricity.

2.3 Transportation

The University will make it a priority to decrease emissions resulting from University-owned vehicles and University-approved travel. Strategies are to include:

- Reducing the number of university-owned vehicles where it is appropriate to do so;
- Replacing the existing fleet with low emission, alternative-fuel vehicles where it is appropriate to do so;
- Implementing a central accounting system that monitors travel distances and mode of all University expensed travel; and
- Working with students and employees to consider their use of University approved travel.

3 – Finance

The University will:

- Ensure that all renovation and new building projects incorporate alternative energy (geothermal, passive solar, etc) or highly efficient building construction techniques wherever it is appropriate to do so;
- Ensure that continued efforts at fundraising for building renewal/renovation and deferred maintenance to lessen energy consumption; and
- Establish a Green Evolving Fund using the savings that result from such projects. This fund will be used exclusively to pay for energy efficiency projects or portions of projects, and will be separate from the annual A&R budget.

4 - Performance Indicators, Accountability and Targets

The Controller will collect information and report metrics and progress on emission reduction in the annual Review of Operations. The metrics to be considered for inclusion are:

- Fossil fuel use and emissions from fossil fuels consumed for heating purposes;
- Electricity use and emissions from annual electricity consumption;
- Emissions from University approved travel;
- Energy consumption and emissions per square foot; and
- Energy consumption and emissions per student and per employee.

The University will:

- Establish a baseline by April 30, 2010, for indicators noted above; and
- Establish interim targets by December 31, 2010, for goals and actions for 2012, 2015 and 2020 and other years to 2039.

Maintained by the Office of the Vice-President (Administration) April 29,

Appendix C. Following up on issues addressed in the 2011 Audit:

Success of the MASU Bike Co-Op

Development of the MASU Bike Co-Op has been a long process, beginning in 2011, and finally opening to the public in July of 2013. This past year has seen positive support for the Co-Op, in the form of donations of over 70 bicycles in the spring of 2014, and in new and exciting involvement coming from the town of Sackville and local community group Renaissance Sackville. This past year the Co-Op has operated largely out of the MASU office, with participants placing deposits and receiving keys in the office, and procuring bikes from a shed constructed by facilities management, found behind the Athletic Centre. This is likely to change, as the MASU bike Co-Op, since renamed the Sackville Bike Co-Op is expected to expand and alter operations to better facilitate greater participation on the part of students and community members alike. At this point the Co-Op is used primarily by students, and for largely recreational purposes. It is expected by those involved in the Co-Op that at this point, reduction of emissions resulting from vehicle use is minimal, however, with the Co-op expected to expand extensively, becoming more accessible to a wider demographic, the Co-Op is anticipated to greatly contribute to a community focus on lowering emissions. The Co-Op also helps to develop a culture which adopts and utilizes alternative forms of travel. In a town of Sackville's size, bicycles are an excellent means of travel and exercise. Not only will the Co-Op provide the bicycle sharing program currently in place, but the hope is that the Co-Op will provide educational workshops and supplies for budding and advanced bicyclists, helping to further perpetuate a culture of alternative, environmentally responsible transportation.

Success of Facilities Management Idling Policy

Although it is not specified in the University Emissions Policy, Facilities Management has an idling policy which pertains to all vehicles owned and operated by those employees of Facilities Management. The policy restricts idling time for those vehicles to thirty (30) seconds. Although the policy has been in place for some time, it has proven to be difficult to monitor and enforce, with the success of the policy largely contingent on the honesty and goodwill of employees. This is a change, which similar to the

reduction of fleet size, will rely on a cultural and behavioural change in order to have the positive affect intended. Facilities Management is strongly encouraged to enforce the Idling Policy further, as the benefits of cleaner air and lower emissions benefit everyone on campus.

Appendix D. Annual Review of Operations

Fossil fuel use and emissions from fossil fuels consumed for heating purposes

2012 was the first year Mount Allison was heated without Bunker A in any capacity, however between 2012 and 2013, natural gas consumption rose from 88,830.91 GJ (giga-jools) to 92,810.23 GJ.

Comparatively, 2013 fossil fuel emission levels from heating have risen by 547 Metric Tonnes from 2012 levels (4456 MT). Furnace Oil was added to calculations this year, as it was used to heat the construction space for the Purdy Crawford Centre for the Arts, which underwent construction throughout the winter months. Although the inclusion of Furnace Oil in 2013 accounts for a portion of the rise in emissions, use of Natural Gas has increased over the past calendar year, and it is this increase that accounts for the bulk of the rise in emissions.

Natural Gas 4985MT

Furnace Oil 18MT

Total Heating 5003 MT

Electricity use and emissions from annual electricity consumption

Emissions resulting from electricity have fallen by 372 Metric Tonnes; from last year's level of 4873 MT to 4501 MT.

Emissions from University approved travel

Emissions from University approved travel fell this past year, with field trip emissions only dropping very slightly, but Employee Travel emissions falling by 144 MT from 2012 levels. In total, travel emissions this year have added up to 1,343 metric tonnes, and account for approximately 10% of all University emissions.

Energy Consumption and emissions per square foot

Taking Energy emissions to be those which result from "Power" and understanding that Mount Allison has 1,060,701 square feet, emissions per square foot are calculated at 0.0042 MT/sq ft, a very slight decline from 0.0045/sq foot in 2012.

With power consumption use at 10,162, 855 KWH, power use per square foot is 1.01 KWH/sq ft.

Energy consumption and emissions per student and per employee

Calculating energy emissions per student and per employee is not an entirely accurate process, as emissions are recorded on an annual basis, covering the calendar year, while student population levels are taken from academic year enrollment. In this case, emissions are from 2013, while the student and staff count is from the 2013/2014 year.

With power emissions at 4501 MT and the student & staff population at 2811, emissions per capita are

1.6 MT for 2013.

With power use at 10,162,855 KWH, per capita use is **3, 615.38 KWH** for 2012/2013.

Appendix E. Emissions Targets

			Targets as a change in percent											
		Baseline 2012	Business as usual			No brainer			Stretch			Utopia		
Type		MT of CO2	May 2014	May 2020	May 2030	May 2014	May 2020	May 2030	May 2014	May 2020	May 2030	May 2014	May 2020	May 2030
Bunker A		-												
Power		4,873	3%	8%	18%	0%	0%	0%	-2%	-10%	-20%	-5%	-25%	-50%
Natural Gas		4,456	3%	8%	18%	0%	0%	0%	-2%	-10%	-20%	-5%	-25%	-50%
Propane		1	3%	0%	0%	0%	-5%	-10%	-5%	-10%	-25%	-5%	-25%	-50%
Diesel		18	3%	0%	0%	0%	-5%	-10%	-5%	-10%	-25%	-5%	-25%	-50%
Emp Travel		1,162	3%	5%	10%	0%	0%	0%	-3%	-10%	-15%	-5%	-20%	-30%
Team Travel		21	3%	0%	0%	0%	-5%	-8%	-5%	-8%	-10%	-5%	-10%	-20%
Field Trips		310	3%	5%	10%	0%	0%	0%	-5%	-8%	-10%	-5%	-10%	-20%
Fleet		64	3%	0%	0%	0%	-10%	-20%	-5%	-20%	-50%	-5%	-20%	-90%
Waste		485	0%	0%	0%	-10%	-20%	-30%	-20%	-30%	-50%	-40%	-55%	-80%
Refrigerants		38	0%	0%	0%	0%	-5%	-10%	-5%	-10%	-20%	-10%	-20%	-50%
Subtotal		**11,429**												
Commuting-Students		1,026	0%	0%	0%	-5%	-7%	-10%	-8%	-10%	-15%	-5%	-15%	-30%
Commuting-Employee		1,421	0%	0%	0%	-5%	-7%	-10%	-8%	-10%	-15%	-5%	-15%	-30%
Total eCO2		**13,876**												

	2014	2020	2030	
Baseline	13,876	14,709	16,180	
Businesss as ususal	14,204	14,696	15,703	~13%
No brainer	13,706	13,598	13,466	~3%
Stretch	13,340	12,392	11,149	~19%
Utopia	13,011	10,620	7,589	~45%