

1 POLICY 2102A – TRANSPORTATION POLICY

This policy was last approved on November 28, 2012 by the Vice-President, Administration.

As per the policy: “Mount Allison is committed to reducing its impact on the environment through the use of vehicles”

1.1 – Introduction

Mount Allison University is in a small community with many amenities within walking distance. The campus is small and is promoted as a pedestrian campus. Most academic and student buildings as well as all residences have bike racks in front of them. The availability of the Bike Co-op enables students and community members to think twice before burning the emissions they would for a short drive across town during the warmer months.

Where Sackville is far from any city centre sometimes it is necessary for a commute by University members. A program has been set up per the Emissions Policy 2101 to track the mileage to calculate the University’s personal carbon footprint based on University funded travel and its owned maintenance vehicles on campus. There are multiple programs offered by the University that involve a lot of travelling such as bringing in guest speakers, travel grants, exchange programs and commuting international students. These are all activities that can be recorded for the purpose of tracking a carbon footprint.

Vehicles used on campus for maintenance purposes are chosen for practical reasons and efficiency and when possible lower emission producing vehicles are considered. Facilities management has a goal to reduce the number of trucks in their fleet.

1.2 – Indicators

Bike Racks are available at Academic and Residence Buildings

There are 15 bike racks around campus. They are typically located in front of residence buildings and a least one is located in front of each student and academic building except for Convocation Hall. There are currently large bike racks in front of Windsor Hall and Jennings Dining Hall and there are plans to put in smaller bike racks throughout the south side of campus for visitors. Harper Hall and Campbell Hall each have bike rooms that lead directly outdoors that serve as a storage room for bikes.

The Mount Allison Student Union runs a bike co-operative during the warmer months of the year. The MASU Bike Co-op encourages physical activity and the use of alternative modes of transportation. Typically, the Bike Co-op services 40 participants throughout the summer and there are 5 bikes to rent. Any member of the University or the community are able to use this service. Bikes can be rented for up to 3 days using a sign out system and paying a security deposit. The security deposit of \$20 is refunded upon the return of the bikes. The bike co-op does multiple events throughout the summer to encourage alternate modes of transportation! This program is funded via a student levee based on a referendum passed every three years. The most recent referendum was passed in 2016.

Emission levels are taken into consideration in the purchase of vehicles

The goal of Facilities Management is to reduce their fleet by removing some of their trucks. Newer vehicles have been purchased which tend to have a better fuel economy as well as have an emissions system on them. Club cars are electric and do not

produce emissions as a result from fossil fuels. They are owned under the carpentry shop and are used throughout campus. ProGaters are used to avoid the emission usage of larger vehicles. The University owns many vehicles across departments to aid with maintenance, field work, research and general use around campus as well as travelling to get supplies. See Figure 1.3.4. When purchasing any new equipment, there is an environmental impact assessment included in the tender. This is assessed as a part of the criteria considered by the Procurement department. In Facilities Management, emissions are considered but it is paramount that the vehicle be able to complete the duties required.

Adherence to, and effectiveness of, vehicle policy

Policy 7903 outlines vehicle operations concerning the fleet owned by Facilities management. The responsibility section of this policy states that each “shop supervisor” in which Facilities vehicles are assigned to, must have a log book to track daily mileage, gas purchases, maintenance items, and oil changes. In the operations section of this policy it states “Vehicles are not to be left running if the vehicle is unattended or if the stop is expected to be more than five minutes.” There is little to no signage on campus issuing an idle-free zone. More education around campus should be implemented for University community members to be able to understand how they can be accountable for their personal emissions.

There is also a policy within the Facilities Management Policies and Procedure manual that addresses fuel conservation and idling, policy 1.16. This policy states that it is known for many reasons that idling results in economic, health and fuel deficiencies and as a result vehicle operators should actively conserve fuel by:

- Minimizing vehicle idling time

- Reducing vehicle warm-up time. Follow the vehicle manual recommendations for idling in extreme weather conditions.
- Accelerating gradually and avoid sudden braking if possible.
- Eliminating unnecessary weight in vehicles.
- Car-pooling whenever possible.
- Ensuring that vehicle tires are properly inflated.
- Ensuring that the vehicle emission control systems are not altered or disconnected.

Section 2.3 of the Emissions Policy 2101 states that “the University will make it a priority to decrease emissions resulting from University-owned vehicles and University-approved travel.” The strategies outlined in this policy 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.

The central accounting system that monitors travel distances and modes of all University expensed travel creates an appropriate measure of accountability of a carbon footprint. There is a report completed annually by the Financial Services department that calculates the carbon emissions footprint each year. See Figure 1.3.5.

Status of Mount Allison's commute

Mount Allison University has a broad demographic of 38.7% of students originally from New Brunswick, 50.7% of Canadian students from outside of New Brunswick and 10.6% of students who are international students as of fall 2014. See figure 1.3.1. On campus of students enrolled in an undergraduate program, 62% as of fall 2014 live on campus (Parsons). This means that 62% of students are in close proximity of campus buildings for class and that it would nearly always be unnecessary to drive a car anywhere. The remaining 38% of students either live off campus near enough to not need a vehicle, or commute from Amherst, Moncton, or areas of Sackville that are considerably further from the University campus. Many students travel back and forth from home to school during breaks, after exams and during long weekends. A shuttle service is offered to students requiring access to the Moncton

Airport before and after extended breaks which allows for carpooling opportunities that would lower general emissions from a student's commute.

The Airport Shuttle Service is a relatively new service at the University was established by the Mount Allison Student's Union in 2012. The service is intended for the ease of student's ability to get home or to school with ease. Typically, the shuttle service runs after fall semester exams and before the winter semester begins. Both shuttles with a maximum of 10 passengers and cabs with a maximum of 4 passengers are used to get University members to the airport on time. This carpooling service by nature, reduces an immense amount of carbon by reducing unavoidable trips between Moncton, NB and Sackville, NB. See Figure 1.3.3.

1.3 – Data

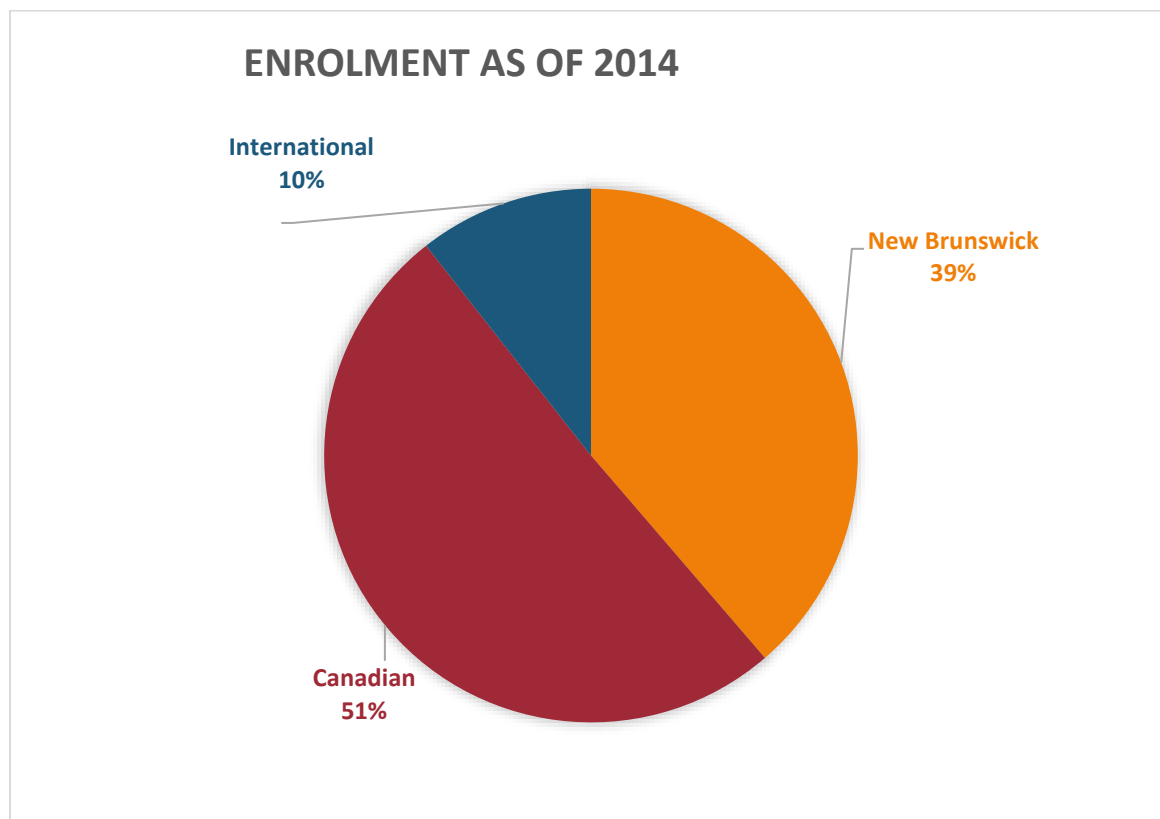


Figure 1.3.1 to give an image of how many undergraduate students travel a greater commute to attend Mount Allison University.

Many students have to take a plane, train, bus or drive a significant distance to come to Sackville, New Brunswick for their semester.

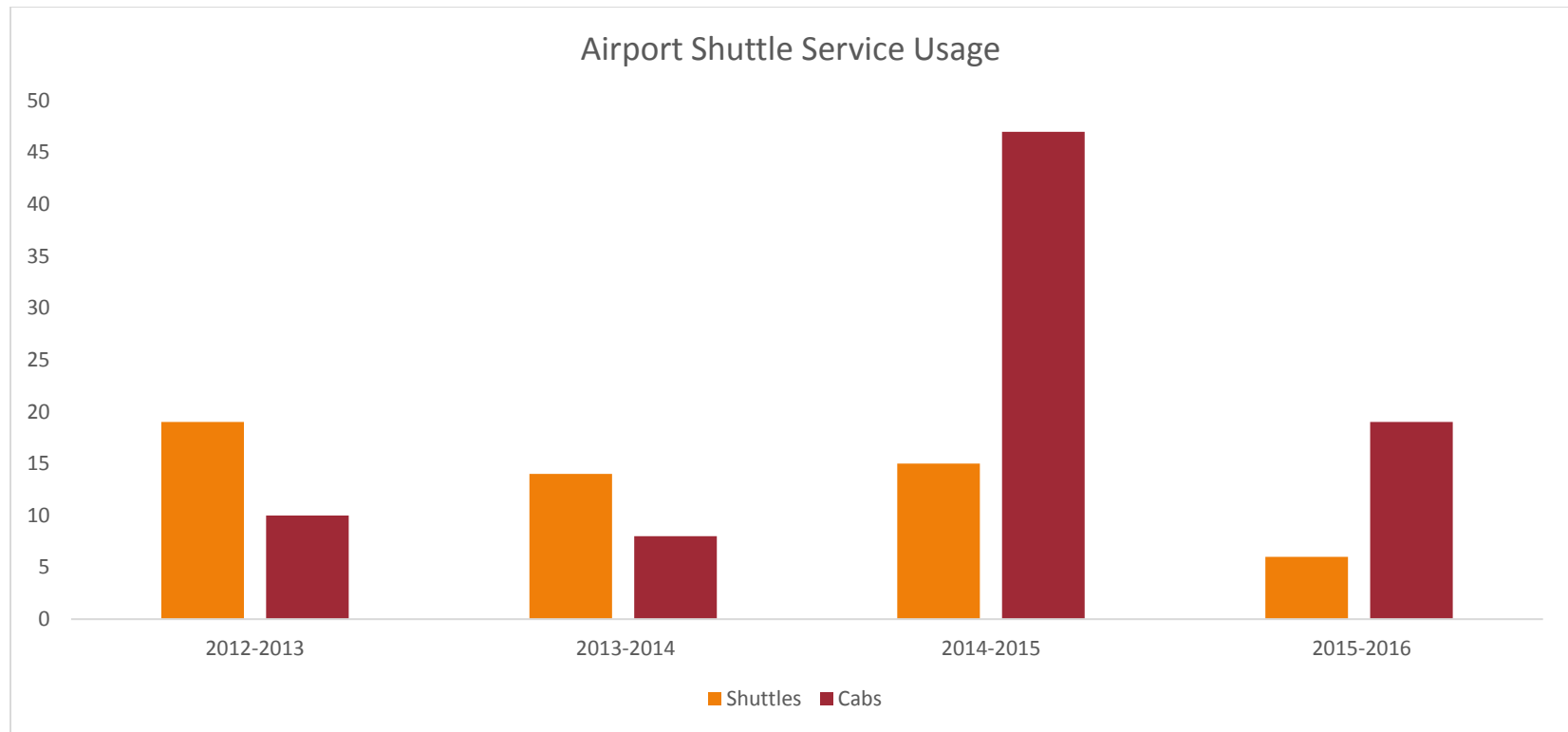


Figure 1.3.3 shows the usage of the airport shuttle service with shuttles transporting an average of approximately 7 on every shuttle and 3 in every cab.

If 19 shuttles are being used with approximately 7 people during the commute to and from the December break in 2012 to 2013 on every shuttle, the amount of trips decreased from 133 to 19. If 19 cabs are used with 3 people in every cab during the commute to and from the December break in 2015 to 2016, the amount of trips reduces from 57 to 19. One way to the Greater Moncton Airport is approximately 42 km from Mount Allison University. The amount of carbon emissions saved from 19 trips carpooled instead of 57 using the cabs was approximately 0.38 tonnes of CO_2 emissions (Zero). The amount of carbon emission saved from 19 trips instead of 133 using the shuttles was approximately 2.28 tonnes of CO_2 emissions.

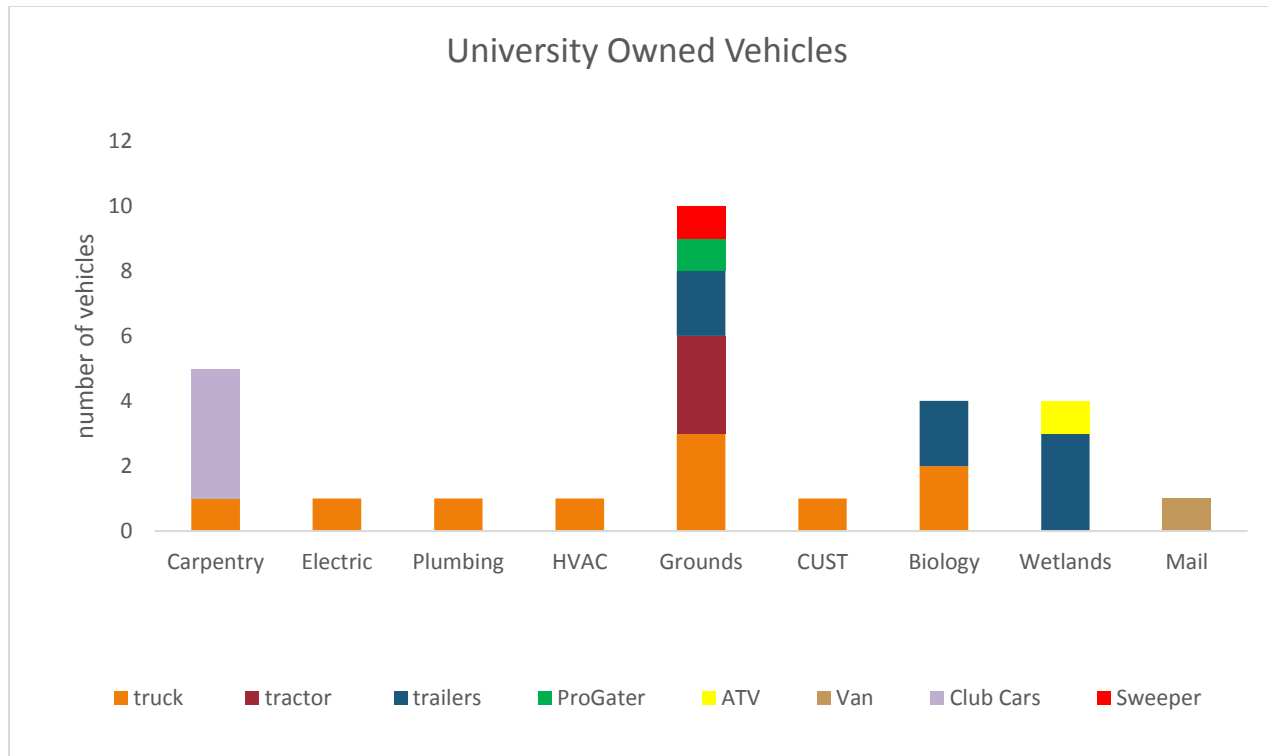


Figure 1.3.4 The University owns 23 insured vehicles across many represented departments as well as club cars and sweepers.

The number of vehicles insured by the University has increased from 18 to 23 vehicles. This addition of vehicles has been a result of academic departments adding more vehicles to their fleet for field research. This figure does not include mowers or other motorized maintenance tools used on campus. It does include club cars and sweepers which are not listed as insured vehicles by the University. These are vehicles categorized under landscaping equipment and do not have odometers. They are instead tracked by hours used. All insured vehicles keep track of their daily mileage in a log book that gets reported to Financial Services.

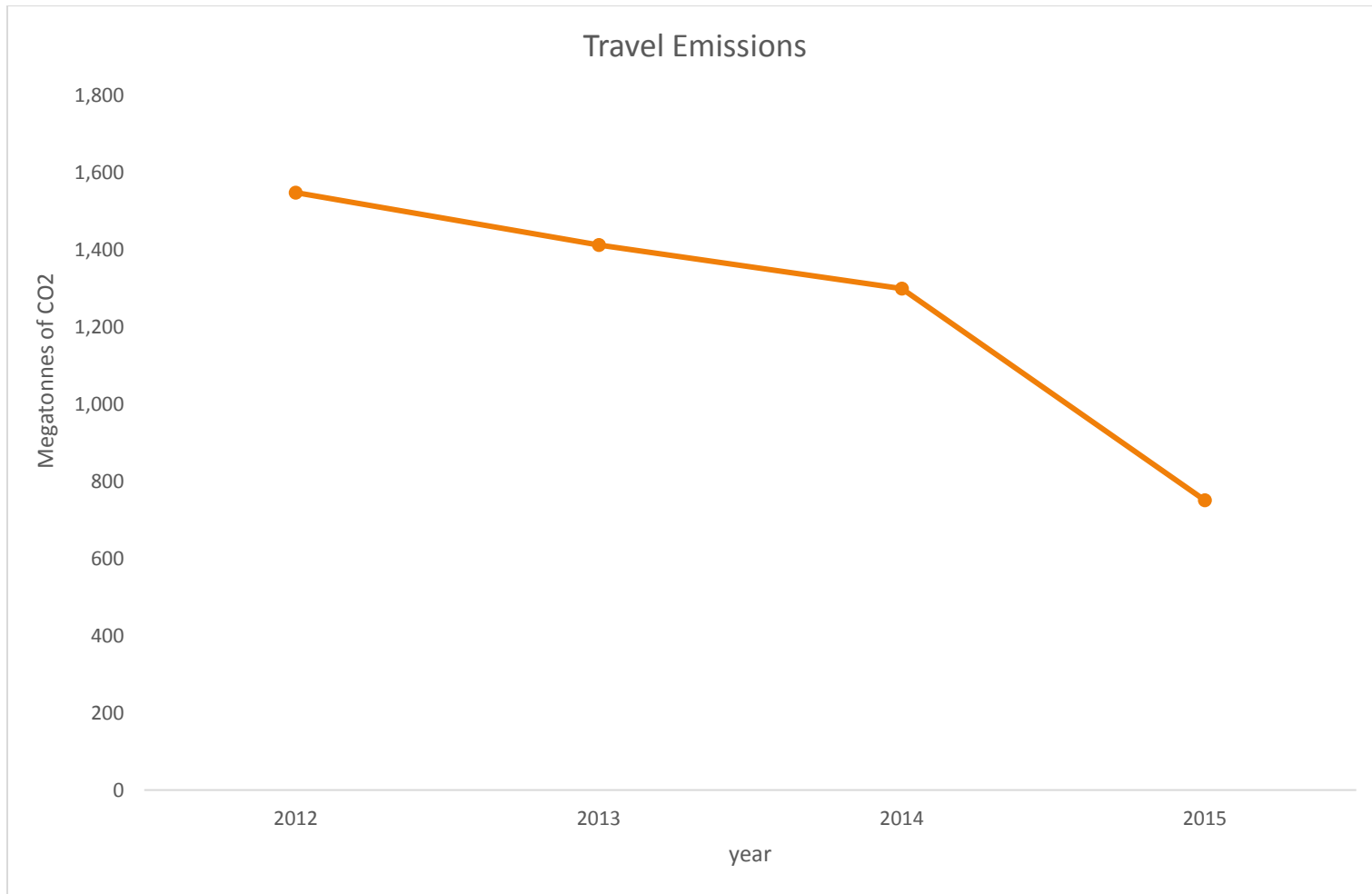


Figure 1.3.5 Emissions from University approved travel

Travel emissions are calculated by keeping record of employee travel, field trips, team travel, and the University's fleet. Travel emissions have dropped a significant amount since the last audit was performed. Employee funded travel has had the most significant decrease in CO₂ emissions contributing to this downward trend dropping from 1162 Megatonnes of CO₂ in 2012 to 454 Megatonnes of CO₂ in 2015.

1.4 – Summary and Recommendations

Summary

Mount Allison University has many policies and programs to look to when it comes to transportation. Simplification and specificity across these policies would provide more concrete grounds when setting goals for future carbon emission saving strategies.

There is encouragement within the University to be conscious of our personal impacts while at work and school. Tracking mileage and University travel allows the University to be aware of its carbon footprint and to consider and measure alternate modes of transportation. Carpooling and bike usage is encouraged at Mount Allison University, however there is always room for improvement when it comes to accessibility of these resources.

Mount Allison University is located in a rural area of New Brunswick and obvious efforts are made to offset the inevitable carbon emissions produced via transportation to, from and around our community.

The University has shown its commitment to reducing its impact on the environment through usage of vehicles by implementing relevant policies and practices. However, improvements can always be made to continue to encourage the decrease in emissions that stem from transportation of members in the University community. This can be done through re-evaluating policies, considering indirect travel emissions from the University community and finally taking action on goals that limit travel from University community members.

Recommendations

There are currently two policies that exist for transportation with similar mandates in both the Emissions policy (Policy 2101) and the Environmental Policy (Policy 2102). It should be considered to merge the two mandates for the purpose of avoiding redundancy and increasing clarity. Where there is also a sub policy within policy 2102 designated to emissions, consider using this section to separate specific mandates regarding transportation from other emission topics.

There should be a vehicle policy, similar to those implicating vehicles owned by Facilities Management in the Facilities Management Policies and Procedures Manual, Policy 1.6. This policy should apply to all University owned vehicles. As it stands, there is no policy for departments or other members of the University owning vehicles insured by Mount Allison to hold anyone accountable for fuel conservation or regular maintenance that would improve the fuel economy of their vehicle. The existing policy should be expanded to incorporate this accountability to avoid redundancy in University policies.

Emissions from commuting are not specified to be measured within this policy as it does not involve University funds. As it states that the University is to “encourage the University community to use less carbon intensive modes of travel” programs and monitoring of commuting emissions from students and faculty should be implemented.

Implementing an organized carpooling network either via the student’s union or University website for students and faculty and staff commuting from outside of Sackville should be considered. This carpooling system would greatly reduce carbon emissions, especially during times before and after extended break periods of

the academic year to people from the Maritime region, but it would also be significant in carbon emission savings to those who participate in a daily commute and do not already carpool with peers and colleagues.

The Mount Allison Student Union's programs, the Bike Co-op and the Airport Shuttle Service fall in the mandate of Policy 2102a and should be supported and endorsed by the University. The Bike Co-op provides educational programming to the community as well as a very accessible resource for all people in Sackville, New Brunswick. The Airport Shuttle encourages "the adoption and use of more sustainable approaches to transportation" being the only organized carpooling system on campus.

The amount of energy reduced by manufacturing recycled paper as opposed to manufacturing it from scratch is significant. This creates savings in waste, carbon emissions as well as costs (Stanford). At Mount Allison University, 100% recycled paper is used for exam booklets that are printed at the book store. The rest of the paper used on campus is made from 30% recycled materials and is certified by the Forest Stewardship Council and is produced using biofuels. This certification means that the trees used for the production of the remaining non recycled portion of the paper come from responsibly managed forests (FCS Canada). The brand used by Mount Allison is ordered through the Book Store and is called Replus. Replus paper states that by using a ton of Replus paper saves the equivalent to 5 trees, 4920 gallons of water, 4600 lbs. of CO_2 emissions, and 502 lbs. of solid waste (Enterprises).

Mass distributed publications

Mount Allison University has multiple groups and clubs that put out mass amounts of printed information to students, faculty

and alumni. Some of these publications include The Argosy, 7 Mondays, The Allisonian and The Record. Though these publications are not printed through the campus book store, they are still mass amounts of paper being used by the University community. The Argosy is distributed weekly on campus and around the Town of Sackville and also has a webpage and puts most of their printed materials online. The paper used for printing the Argosy is made from 100% recycled materials. 7 Mondays is a society whose printing is entirely dependent of a referendum vote. The Allisonian is printed and mailed to graduating students with leftover prints set out for any student to take. Any leftover year books that do not get claimed are stored and are often sought out by alumni. The Record is a magazine distributed to alumni all over the world twice a year. This year The Record is cutting back to only one print publication a year and one exclusively online publication. Currently all editions can be viewed online.

2.3 – Data

There are 47 printers throughout campus whose usage is tracked via the Environmental Dashboard on each University member's print accounts. There are also 4 printers in the print shop. In 2015 all old RICOH printers, except for those in the print shop were replaced with new Konica Minolta Printers. The new Konica printers use a polymerized toner which claims to achieve a 40% reduction of CO_2 emissions in comparison to a conventional toner. The company also states that power consumption is optimized for each operation on the printers so as not to use an excess of energy. These new printers are also certified under EcoLogo™, Energy Star, Germany's Blue Angel Mark, and Japan's Eco Mark and Eco Leaf programs (Minolta).

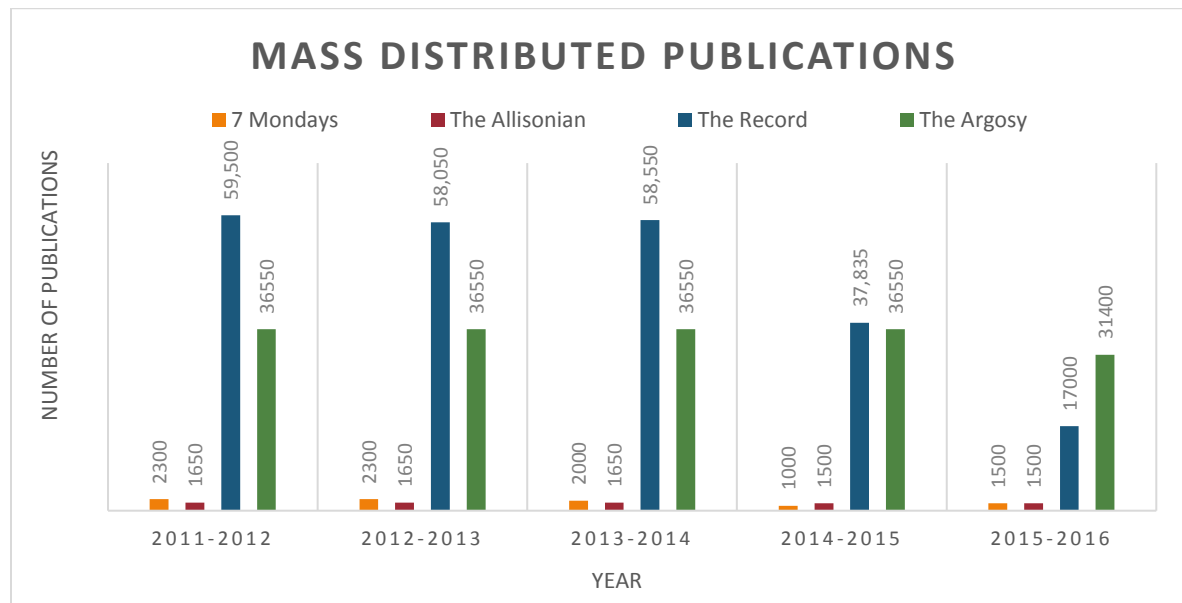


Figure 2.3.1 Publication on paper that is not sourced from the campus book store distributed to students, faculty, community members and alumni.

Many publications have decreased in quantity due to drops in enrolment, environmental conscientiousness, and movements to online publications. The paper for these publications are not from the same distributor as the Book Store. The Argosy for example, uses Ecopaque paper for their publications.

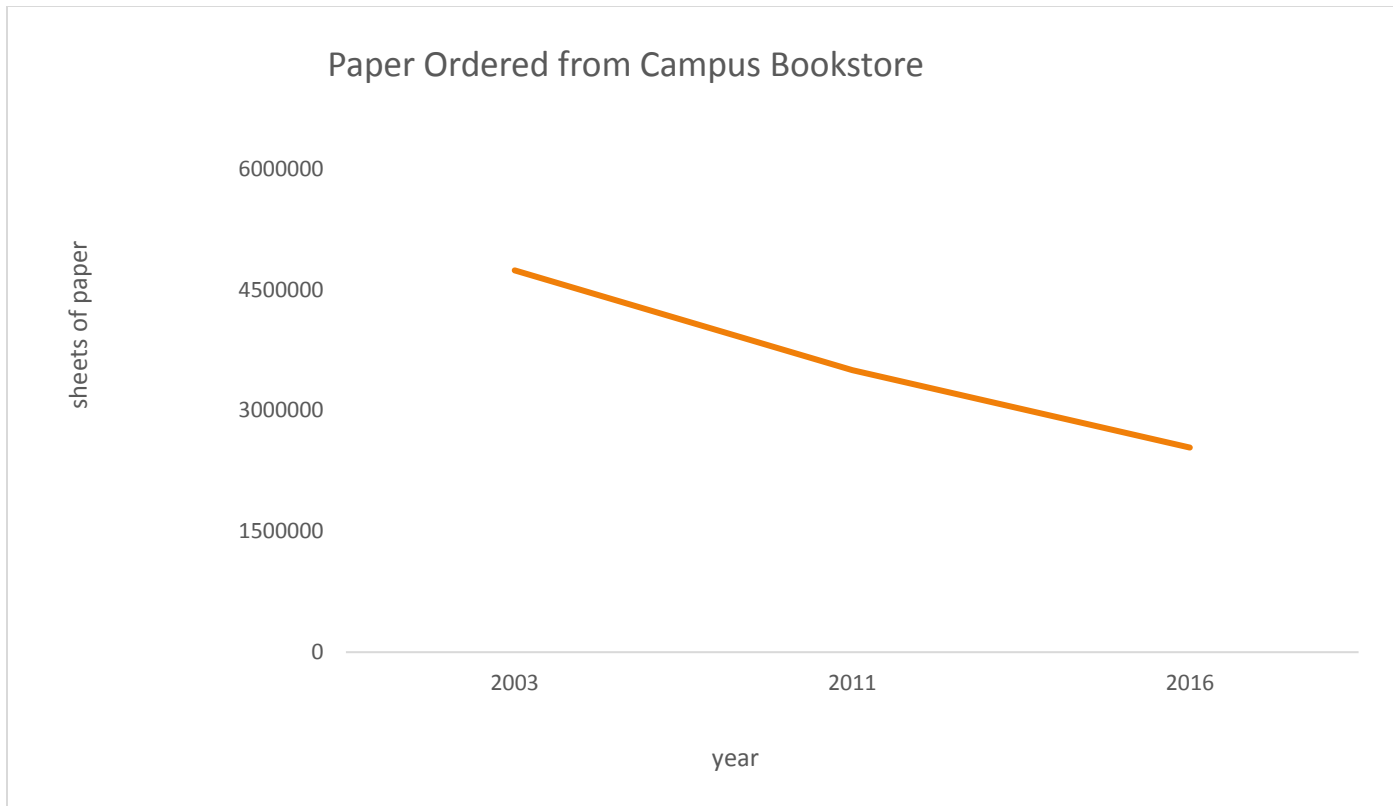


Figure 2.3.2 Amount of paper ordered during years of past audits and distributed from the campus book store.

There has been a steady decline in use and need of paper. Paper that is ordered from the bookstore decreases every year as more and more computers become available to students. As a result of this, online materials have become more accessible. This data accounts for all paper purchased by the bookstore supplied to all of the printers around campus. It does not include mass publications or specialty printed items from the print shop on campus.

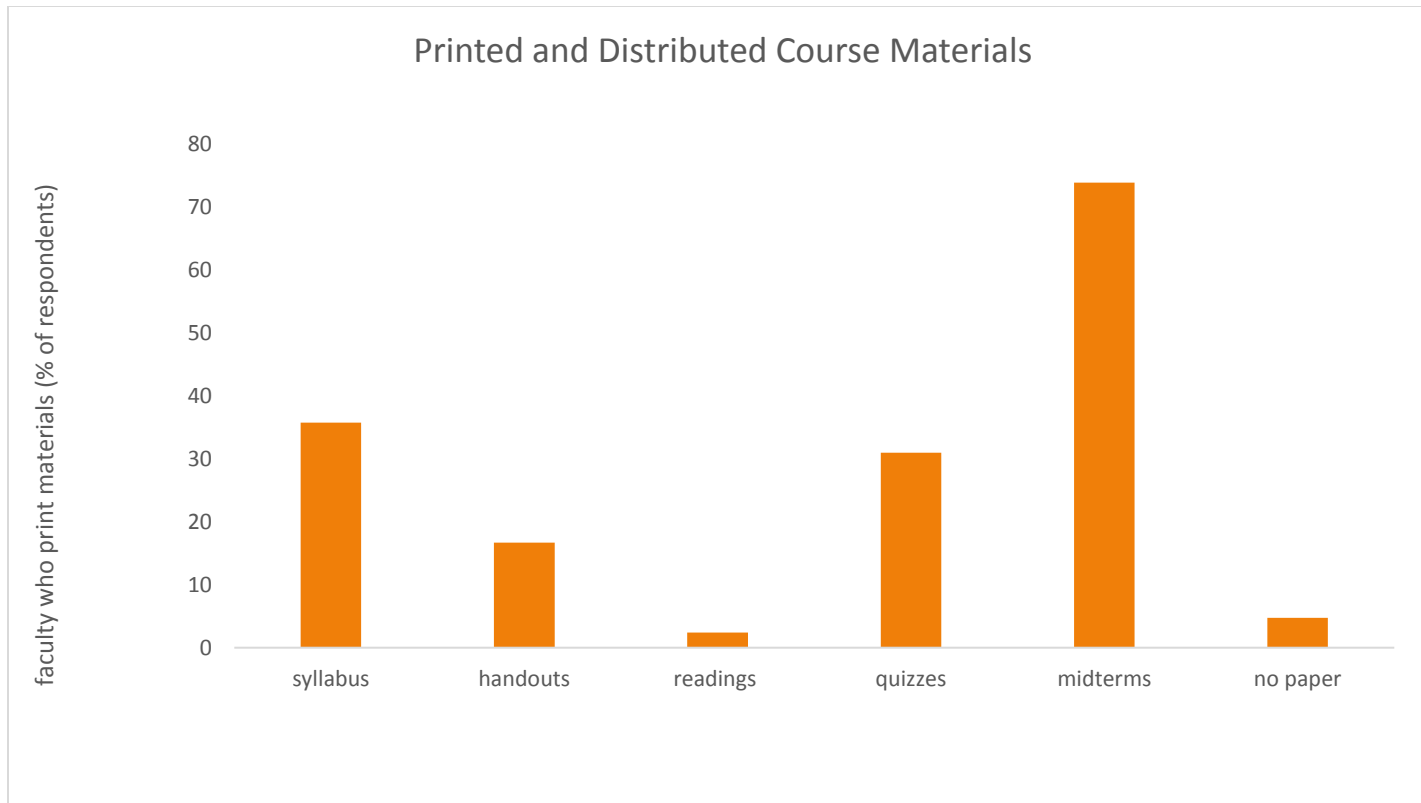


Figure 2.3.3. The majority of course materials such as midterms and syllabi typically printed off and handed out to students.

From a sample size of approximately 25% of the teaching faculty at Mount Allison University it was found that 73.8% of faculty print off midterms for their classes, 35.7% print the syllabus for their courses, 30.9% print quizzes and assignments, 16.7% print handouts and 2.4% print supplementary readings. Although many of the respondents indicated printing at least one or a combination of many of these items there were 4.8% of respondents that indicated using no paper or print outs in their courses at all.

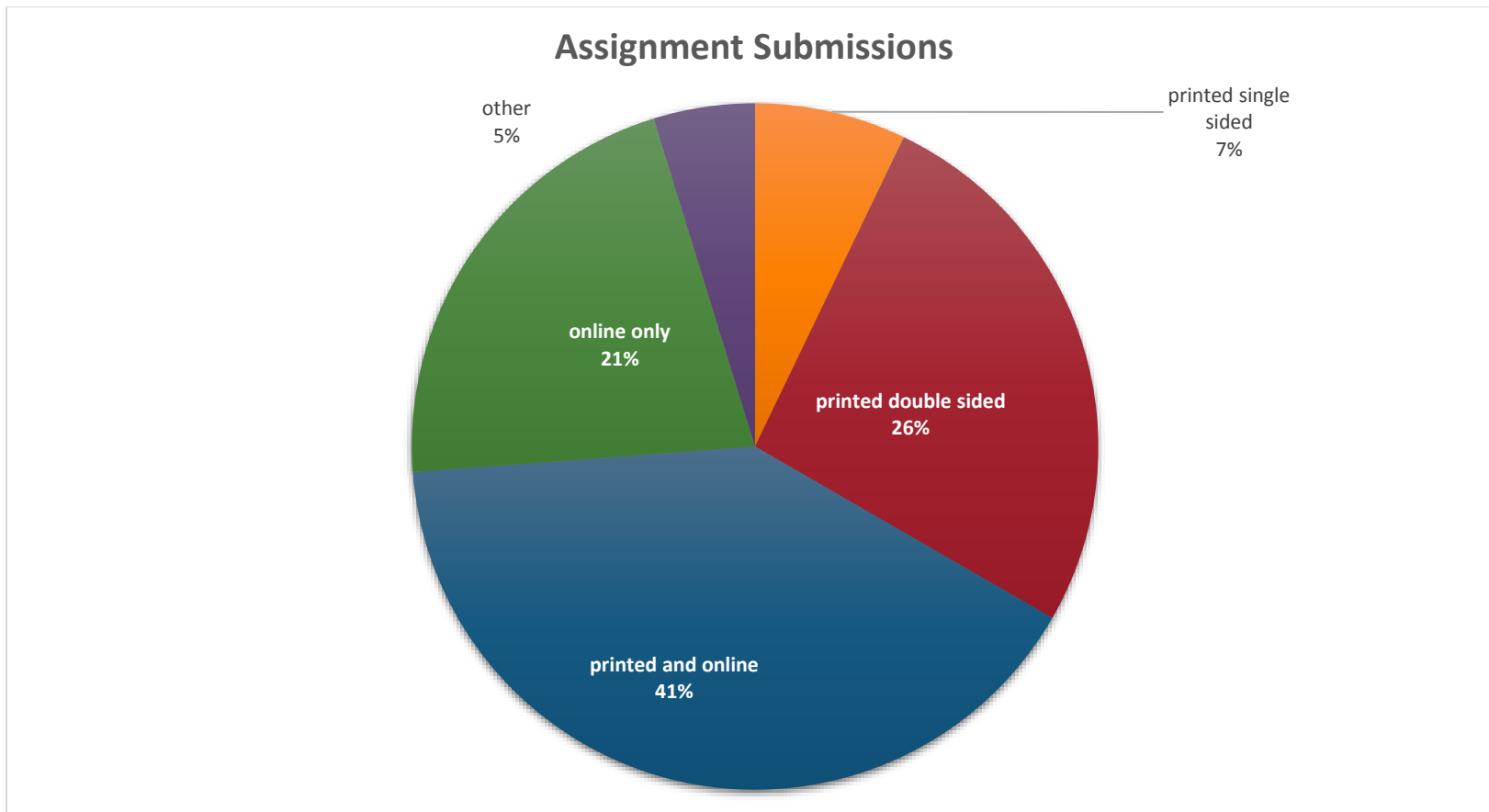


Figure 2.3.4 Online compared to paper submissions accepted by professors.

From a sample size of approximately 25% of the teaching faculty at Mount Allison University it was found that 40.5% of teaching faculty accept a combination of both printed and online submissions, 26.2% accept only paper submissions but accept double sided printings, 21.4% accept exclusively online submissions and 7.1% indicated that they only accept single sided paper submissions. A total of 4.8% of respondents skipped the question indicating that submissions are given in a different form or not altogether. Some teaching faculty indicated that depending on the type of course, introductory versus upper year, dictated whether or not paper or online submissions were accepted for the purpose of feedback.

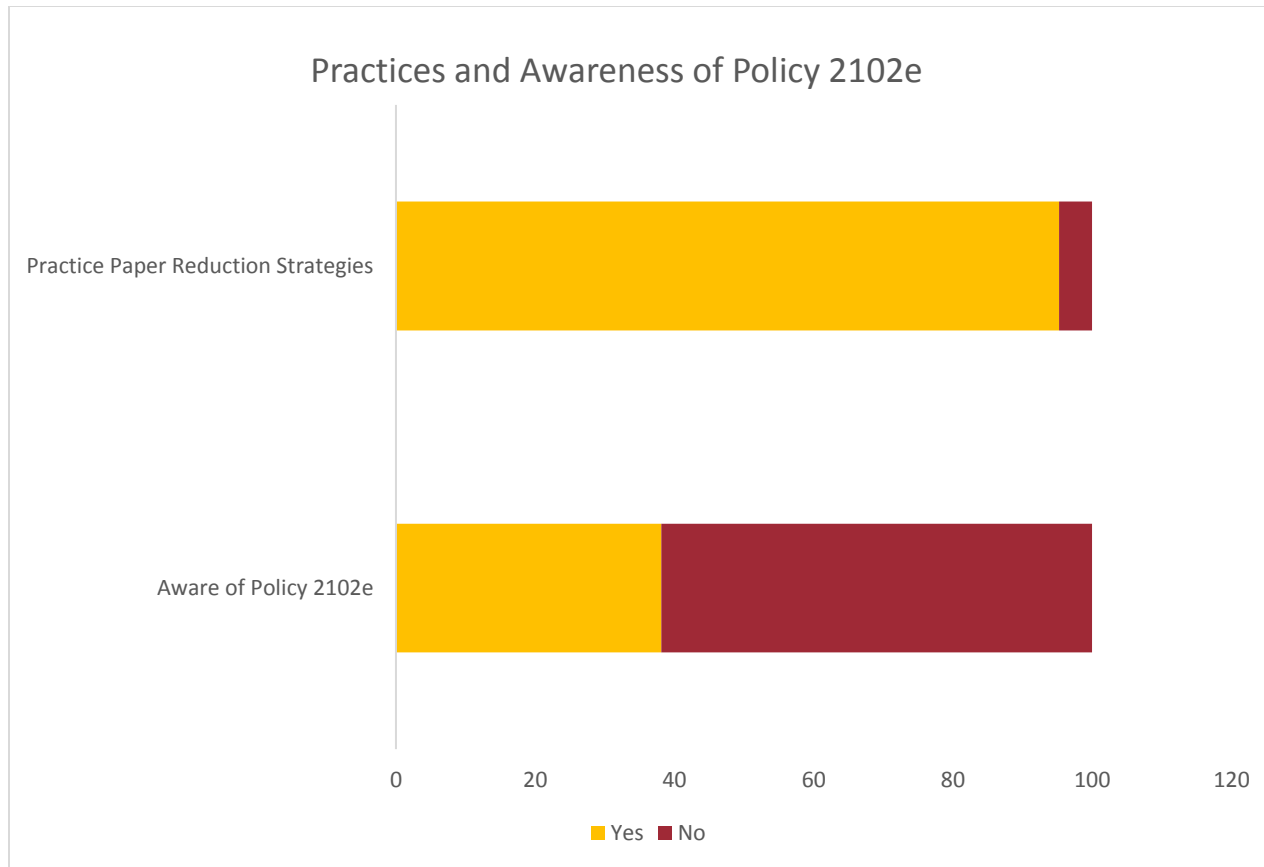


Figure 2.3.5 Awareness and adherence to the Paper Policy of the Environmental Policy (Policy 2102e)

From a sample size of approximately 25% of the teaching faculty at Mount Allison University it was found that 61.9% of faculty are unaware of the existence of the Paper Sub-Policy of the Environmental Policy. Despite over half of respondents not knowing of this policy, 95.2% consciously practice paper reducing strategies in relation to their course materials.

3 POLICY 2102F – GROUNDS POLICY

This policy was last approved on November 28, 2012 by the Vice-President, Administration.

As per the policy: “Mount Allison’s grounds operation supports the work and other activities of, and provides a safe and attractive environment for students, faculty, staff and visitors. This policy is intended to promote the adoption and continued use of approaches to grounds maintenance that will reduce the adverse impact on the environment.”

3.1 – Introduction

Mount Allison University has a variety of natural, gardened, recreational and education facilities on the grounds of the University property. The grounds operations actively supports the work and other activities to ensure they take place in a safe and attractive environment. The grounds are an inviting place for students and faculty to enjoy as well as to learn from. In maintaining the grounds areas, there are many items that need to be considered in terms of impact on the environment.

In examining the usage of pesticides in compliance with the Sackville By-law No. 201 (Town Council) and other contaminants such as salt, a measurement of impact can be obtained. Pesticides and road salts can be washed into runoff water, contaminating water and soil as well as contributing to the erosion of surrounding areas.

Plant species on campus are carefully planned and thought out in landscaping projects across campus in order to favour sustainability as well as aesthetics. Facilities Management uses a method called xeriscaping whose purpose is to decrease the

amount of resources used while keeping gardens and vegetation healthy. New options of planting have since been adopted to reduce water usage and drainage such as using planter boxes instead of planting in the ground.

Another measure that will be considered in this report are accessibility to waste and cigarette receptacles on the grounds as well as the impact and sustainability of the furniture and other accessories on campus.

3.2 – Indicators

When pesticides are used, only 100% organic pesticides are used.

Pesticides are not regularly used and are only used if absolutely necessary in the form of herbicides. Generally, the only case for using pesticides is to stop the spreading of disease to plants and weed infestations in the sports fields. The weeds clump the soil together causing bumps in the field which pose a safety hazard. The last time any field was treated was 2013. A mixture of herbicides mecoprop-p pcp 27891, vanquish herbicide, mcpa amine 500 pcp 9516 was used. Herbicides used by the University are certified organic food grade substances such as vinegar.

The Grounds department at Mount Allison uses an Integrated Pest Management Toolbox to control pests such as bugs and weeds. Practices such as making sure to plant only plants and trees that have been well taken care of during younger phases of its life are used. This makes the plants less susceptible to disease and harsh conditions. Planting a multitude of different species also aids in avoiding the detrimental effects caused by certain pests and parasites. Other methods of controlling for pests involve blowing, vacuuming or picking off bugs from plants, however, this is rare as

there is not a huge issue of bug infestations in Sackville, New Brunswick.

Yard Waste is composted.

Yard waste is normally composted in the Grounds compound and is used for gardening on campus as well as given to the Town of Sackville. Yard waste is composted separately from food waste which is composted behind Jennings Dining Hall in the composters commonly known as “Dirt and Ernie”. This summer, the site of the composting has been converted to a space for storing the fleet of vehicles for the Sciences department. The University makes a lot more compost than it can use and currently what is produced by Jennings Dining Hall is enough to sustain Grounds operations until a new site is established. Mount Allison gives away the compost that is not used. The rest is stored and accumulated from year to year. Especially during years when the Mount Allison Farm is not running there is an excess of compost. The amount of compost accumulated varies greatly and depends on the amount of tree and stump removal taken place that year.

The amount of compost created is not measured but is used frequently. For flower boxes on campus a soilless media is used combined with campus yard waste.

The landscape design incorporates native New Brunswick plant species.

Generally, when plants and trees are chosen there are many things taken into consideration such as aesthetic, low maintenance life spans, adherence to the International Society of Arboriculture guidelines, safety, as well as diversity in both age and species. Typically, there is an effort to grow native plants, however, native plants to New Brunswick are not necessarily suited to grow on an

urbanized setting such as a University campus. There are more considerations as to what will grow given the specific soil distribution, drainage, ability to withstand harsh weather and to what will be attractive on campus without impeding access to inspections or damaging power lines in the future. The University’s Grounds Supervisor, Andrea Ward, an arborist by trade and other qualified Grounds staff are responsible for most of the decisions concerning vegetation on campus. Many of the trees and plants on campus are Native but many are chosen to reduce impact based on maintenance over its lifespan. Trees and other plants on campus are sourced locally when possible, however many larger purchases come from fields in Ontario.

The landscape is designed to use minimal resources.

Xeriscaping is a practice used on campus to minimize the amount of water that is dispensed. For plants such as sod and newly planted or recently transplanted items, they are watered for the first year. The species of the plants that are chosen are meant to require low maintenance and grooming after the first year of care. During the summer of 2015, flower boxes were first used as opposed to planting in gardens. The boxes retained more water so that Grounds did not have to continually water them throughout the summer. This allowed for brightly coloured annual flowers to appear on campus and use very little resources all summer long. They also were used as a blockade for traffic control around campus and worked very well!

During the summer of 2015 the McCauley Field was replaced with a turf field, Alumni Field. Although the field is not entirely immune to weeds, it does not need to be watered in order to be maintained. The addition of the turf field did eliminate a green

3.3 – Data

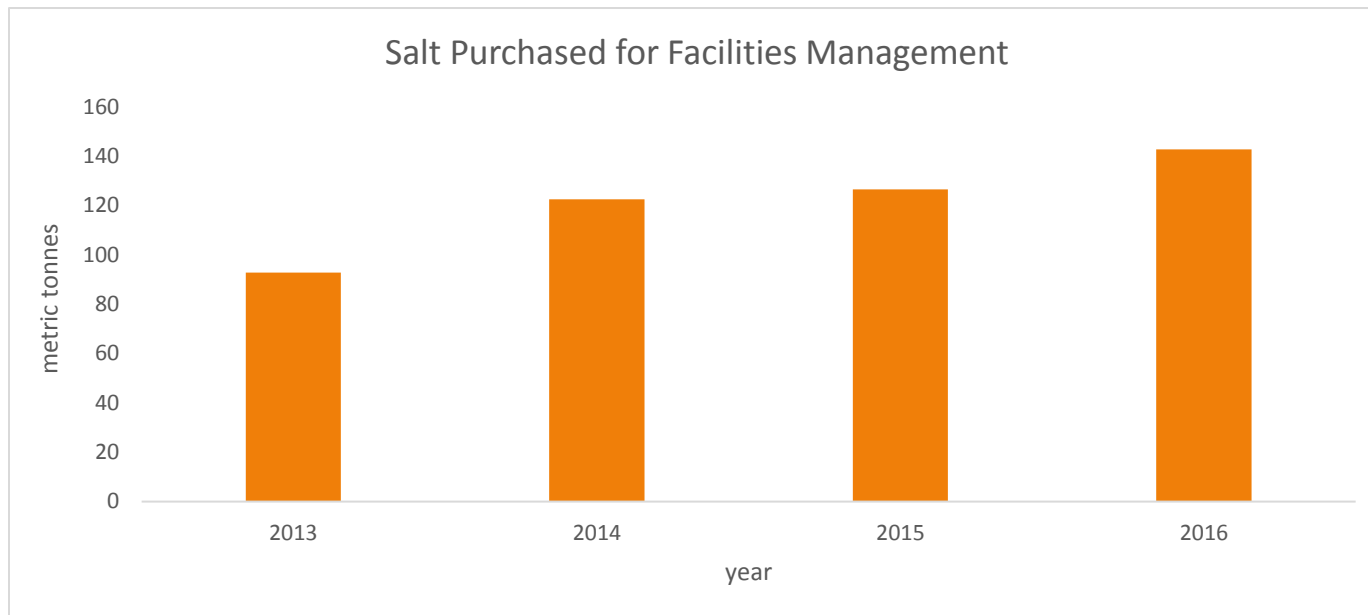


Figure 3.3.1. Salt purchased used for de-icing during winter months.

Salting walkways on campus is arguably one of the most impactful activities used by the Grounds Department. Salts used can be damaging to certain plants and ecosystems from water runoff and seepage however, it is important to have for safety precautions. Many other alternatives have and continue to be explored. Typically rock salt is used. Other substances that have been tested cause damage to stone and other fixtures on campus. After snow is melted in the spring sometimes there are brown spots as a result of over salting near grassy areas. The purchasing amounts of salt is weather dependent as safety is the overriding factor in how much is actually dispensed around campus. Approximately 3-6 pallets of bagged salt is used per year in front of building entrances.

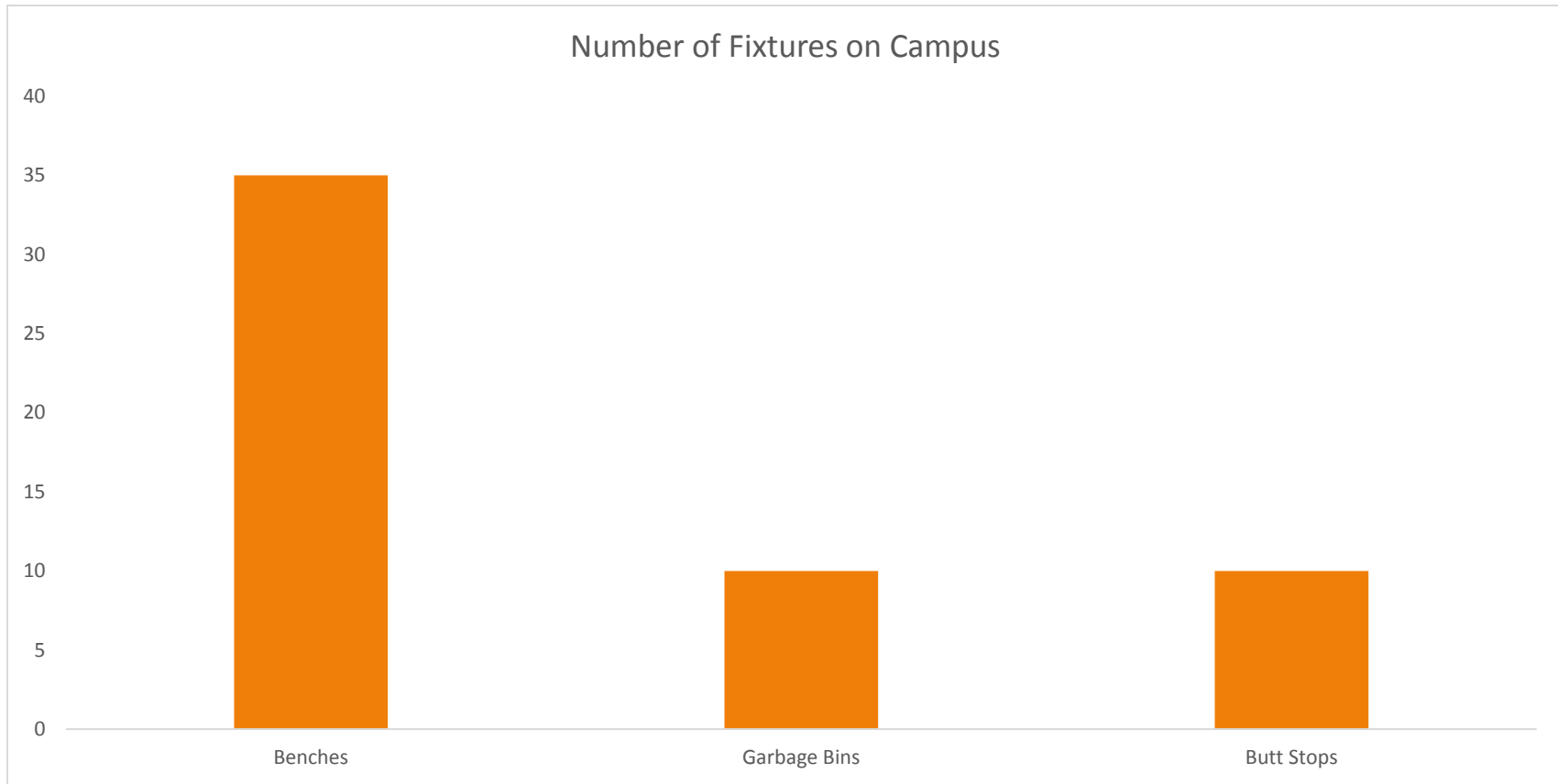


Figure 3.3.2. Fixtures on campus aid in creating a welcoming environment and the ability for members of the community to keep the grounds clean and free of litter.

Fixtures on campus have provided a way for members of the University community to enjoy a clean environment as well as participate in keeping it aesthetically pleasing for others. Fixtures on campus are purchased on the bases of them becoming a long term investment without the need to constantly be replaced.

indicator there should be a way that it can be quantified or compared to from audit to audit.

Measures that should be considered under the Grounds policy include access to waste receptacles, cigarette butt receptacles, sustainability of furniture such as benches and other aspects of grounds operations that pose a significant impact on the environment.

Continue to explore reasonable alternatives to salting in the winter that would be feasible to weather faced within Sackville, New Brunswick.

4 POLICY 2102G – BUILDINGS POLICY

This policy was last approved on November 28, 2012 by the Vice-President, Administration.

As per the policy: “The University is committed to constructing, operating and maintaining its buildings in ways that will reduce operating costs, provide healthy environments for students, faculty, staff and visitors and contribute to the goals of protecting, conserving and enhancing the environment.”

4.1 – Introduction

The University owns and is responsible for a number of buildings in Sackville, New Brunswick. They arguably are the most environmentally impactful aspect of the school. Their impact can be measured through electricity and energy consumption, water consumption, or waste output. Using these metrics, it can be determined what the overall trend in consumption is. It can then be analyzed to determine whether or not specific targets that are outlined in the policy are being met.

The University is serviced by NB Power, The Town of Sackville and the Westmorland Alberta Solid Waste Corporation. The buildings on campus have a number of hardware, technologies and programs to limit energy and water usage and waste on campus. Through updates and renovations in accordance with the Green Globes standards, care is taken to try and incorporate as many technologies and impact reducing items as is possible.

4.2 – Indicators

Response time for major building maintenance and repair is monitored and minimized.

The Facilities Condition Index (FCI) is a comparative measure to calculate the relative condition of facilities on campus and is expressed as a percentage value.

$$FCI (\%) = \frac{\text{Deferred Maintenance (DM)}}{\text{Cost Replacement Value (CRV)}} \times 100$$

The lower the value of the index, the better the state of the facilities. Because of the high value of current deferred maintenance, the FCI is quite high. This is because many buildings on campus are currently past their lifespan in terms of infrastructure as many of the buildings built in the 1960’s are older than 50 years old. As it stands, approximately 45% of buildings on campus are between 25 and 50 years old and 20% are older than 50 years. Only 19% of buildings on campus are newer than 10 years old. The current FCI value is approximately 22.84% which is extremely high although improved. At the time of the last audit of Policy 2102g the FCI value was approximately 25%. These values are calculated by Facilities Management based on costs of maintenance needed over the renovations and maintenance completed. As new infrastructure and renovations take place on campus, this value decreases. Strategies to reduce the FCI value are based on goals outlined in the Campus Master Plan.

The Fix It program is used for smaller maintenance items throughout campus that can be reported by members of the University community. Items such as heat issues in certain rooms both academic and residence, leaking taps, electrical issues and things of the like can be reported and a work order will be issued. A work order is a documented record of a maintenance issue on campus. This program has been successful on campus, especially in residences. Facilities Management documents approximately 4300 work orders annually.

The Eco- Rep program has been expanded to include most Academic buildings on campus along with one for every Residence building. The program is meant to have students who use the many buildings on campus to perform mini audits in their appointed building. After completing a training tour with a member of Facilities Management, Perry Eldridge, the Eco Rep goes through the building on their own and picks out items that are compromising the efficiency of the building. For example, in an Eco Rep report, a drafty window, leaking tap or flickering light may be reported on. The reports are directed to facilities and then archived along with the correspondence that follows with work order numbers and discussion on the issues brought forth. Many issues have been identified, such as having proper waste receptacles in accessible locations of each building and adding light motion sensors to bathrooms and hallways that are often forgotten.

The Eco Rep program is also responsible for mobilizing the Campus Climate Challenge on Campus, C3. This campaign spreads awareness about ways to reduce a personal carbon footprint. While encouraging these initiatives, the energy usage during what is usually one of the highest annual quarters for energy consumption, decreases significantly. The cost savings in this decrease is also significant. It has been a trend that as new renovations and maintenance continues in buildings on campus it becomes more difficult to increase efficiency by using eco-conscience habits, as the buildings are themselves becoming more and more efficient. This should be incentive to update as many facilities on campus as possible and shows that many of the buildings on campus are currently incredibly inefficient. Though the academic buildings were not included in the competition, they still participated and showed a significant decrease in energy consumption.

Currently there is a monitoring system in place that can track the kW/hour usage in each building on campus. Some of the monitoring is incomplete meaning some buildings record no data. These buildings include the Ralph Pickard Bell Library, Hart Hall, Avard Dixon and a few others. None of the buildings owned by the University are monitored that are off campus. The University is taking steps to upgrade the metering system so that the readings can be more accurate through calibration and the data can be more accessible to members of the University.

Prior to new building or renovation projects an environmental impact analysis (EIA) is completed.

Environmental Impact Assessments are not completed on top of old building sites or already developed sites. All new building constructions that have occurred since the last audit have been built on top of sites where buildings had previously existed. In the event of a construction that potentially would happen over contaminated soil, such as the field behind the King Street Parking Lot, or anything that would impact the environment of the Sackville Waterfowl Park, through contaminants or sediments, would require an EIA.

Facilities Master Plan is near its end. This plan outlines upgrading and new infrastructure goals within Facilities Management. The plan is set out in phases and followed as closely as possible with some deviation as a result of funding or other obstacles. Renovations in regards to academic buildings have been followed closely according to plan. Residence renovations have been followed, new buildings have not been built. The Purdy Crawford Center for the Arts has been built and is expected to achieve 4 Green Globes, equivalent to an LEED Gold.

Building construction or renovation makes use of green building techniques, materials and disposal.

When new construction projects happen on campus, guidelines are followed by Green Globes and are implemented when economically feasible to do so. Green Globes bases their evaluation off of a points system. The points are allocated based off of parameters in project management, site, energy, water, materials and resources, emissions, and indoor environment and there are 1000 points available to be scored. Currently only the Wallace McCain Student Center and the Fitness Centre within the WMSC have a Green Globes certification of 3 and 4 Green Globes respectively. The Purdy Crawford Centre for the Arts should qualify for 4 Green Globes but the certification has yet to be administered. Three Green Globes indicates scoring between 55% to 69% and four Green Globes indicates a scoring from 70% to 84% (Energy). Campbell Hall has a CBIP certification with a plaque that recognizes the building as an “energy efficient building aimed at reducing greenhouse gas emissions”. CBIP or the Commercial Building Incentive Program recognizes standards by LEED and Green Globes and offers a monetary incentive to organizations whose buildings meet specific standards to a sustainable building (Energy Star Participant). These certifications are considered to be awarded to building renovation projects that fall into a category of \$10 million or greater.

To save water low flowing shower heads, as well as air cooling systems instead of water cooling systems, dual flush and low flow toilets, aeration in taps, and a cistern in the Wallace McCain Student Centre which can hold approximately 13000 litres of rainwater for flushing toilets in the building. Many of these projects have been implemented such as the toilets and shower heads since the last audit. Figure 4.3.1 shows the savings in water as a result of some of these projects.

To save energy all buildings lighting is moving towards implementing LED lighting to replace old lighting in buildings. Many of the new buildings renovations incorporate LED lighting projects. Also in the Jennings Dining Hall, there is a light scavenging daylight harvesting system. During the day as light shines in, there are sensors that dim the light indoors. This saves energy from unnecessary light throughout the day. Lamp poles on campus have been recently switched from a timer to a computer controlled system. This ensures that lights come on only when it is dark.

In 2010 the Green Initiatives budget was established and used funds from energy savings to go towards ‘green’ initiatives. After 2014 this fund was eliminated (University). These funds were used to go into pay back projects that saved on emissions and energy usage on campus. The projects were prioritized by quicker payback times. This fund was very successful and was able to complete many energy efficiency projects over the course of the years. Once all of the smaller projects or ‘low hanging fruit’ were accomplished, longer payback projects began to be considered. Because of the scale of these projects, the fund and savings from projects were instead incorporated in to the alterations and renovations budget. Although this means that not all funds go towards ‘green’ renovations, energy efficiency is always something considered during renovations. Some of the projects that resulted from this fund included lighting projects, updating equipment such as freezers and other building renovations with energy efficiency in mind. Larger ‘green’ projects that are concerned with efficiency are considered upon evaluation of an energy audit. Projects with payback times less than 5 years are considered a priority in terms of renovations. Projects with payback times between 5 to 10 years require more consideration as new technologies are constantly

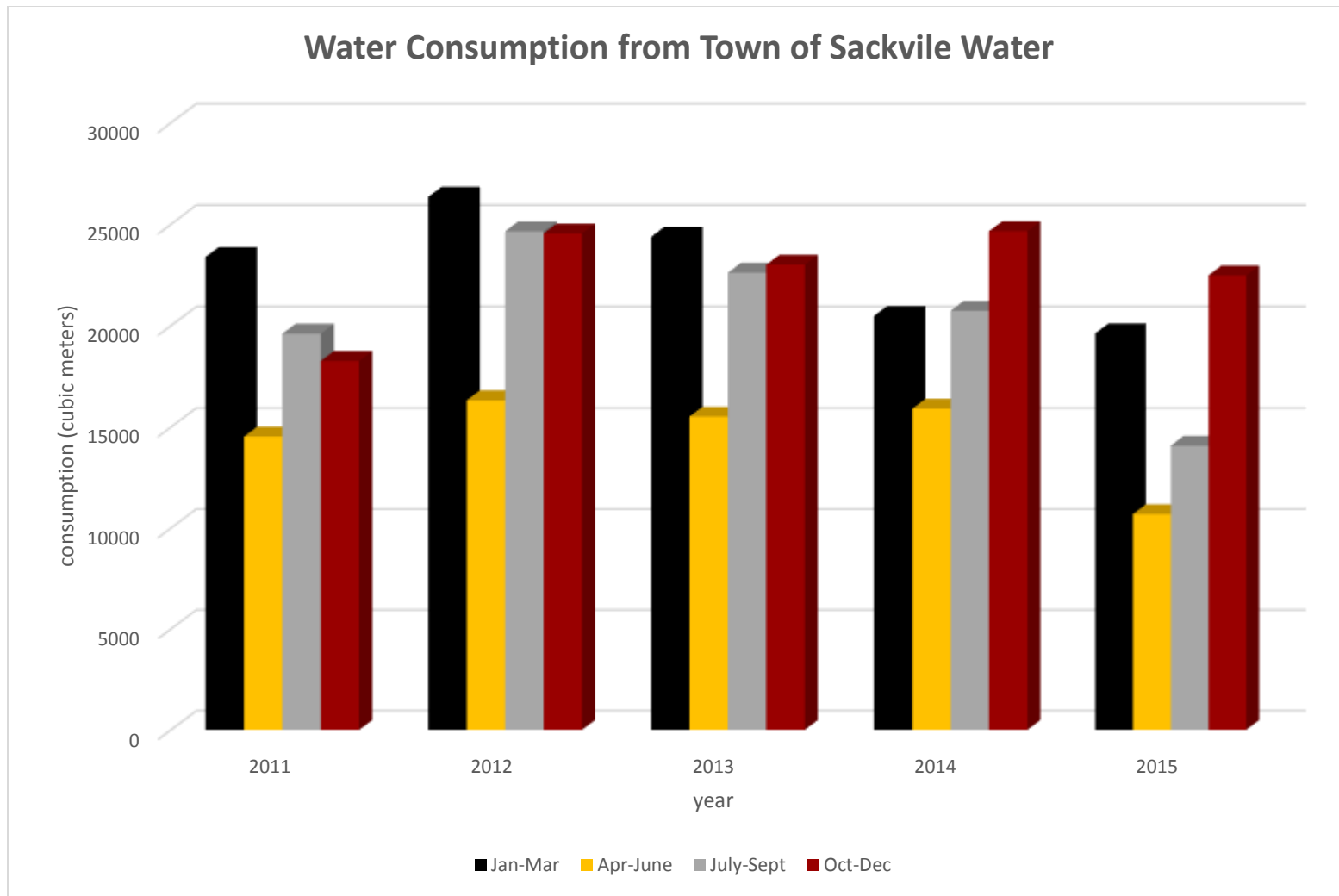


Figure 4.3.2 Quarterly breakdown of water usage by University owned properties

University water usage, since the last audit was performed, peaked in 2012 and has since had a steady decline with most water being used throughout the months of October to March. A likely reason for this decline can be attributed to things like low flowing bathroom fixtures, aeration in washroom taps so that less water can seem like more when washing hands in terms of appearance and volume.

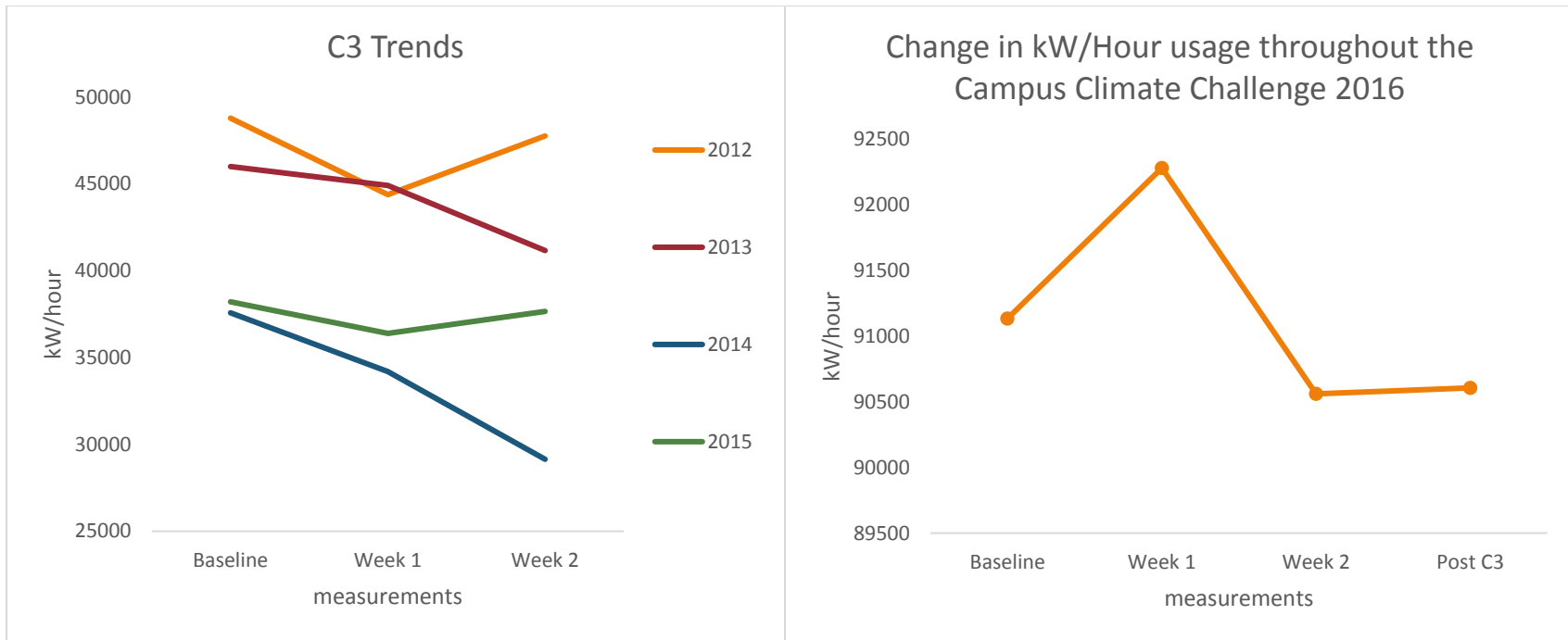


Figure 4.3.3 kW/hour usage before and during the campus climate challenge. 2016 was the first year both academic building measurements were calculated as well as a post measurement was recorded.

During this educational campaign, energy drops dramatically. This translates to savings in dollars and carbon emissions. On average the carbon emissions saved during this campaign equal to 3.26 tonnes CO_2 from 2012 to 2015 from residence buildings alone. 2016 was the first year that a week after the campaign was measured and was shown to have barely increased. In 2016 in the first week 0.29 tonnes of CO_2 were saved across all buildings on campus (Zero). This dramatic drop is likely indicative of the many buildings on campus that are inefficient in terms of items that people using those buildings have control over. This includes leaving lights on which could be and is in many buildings, remedied by LED or motion sensor lights. Items such as shutting down electronics in the evenings when they aren't being used, encouraging the use of stairs instead of an elevator when possible and residents using cold washes and air drying laundry will most likely become as normal as motion light sensor, only if education on such items persist.

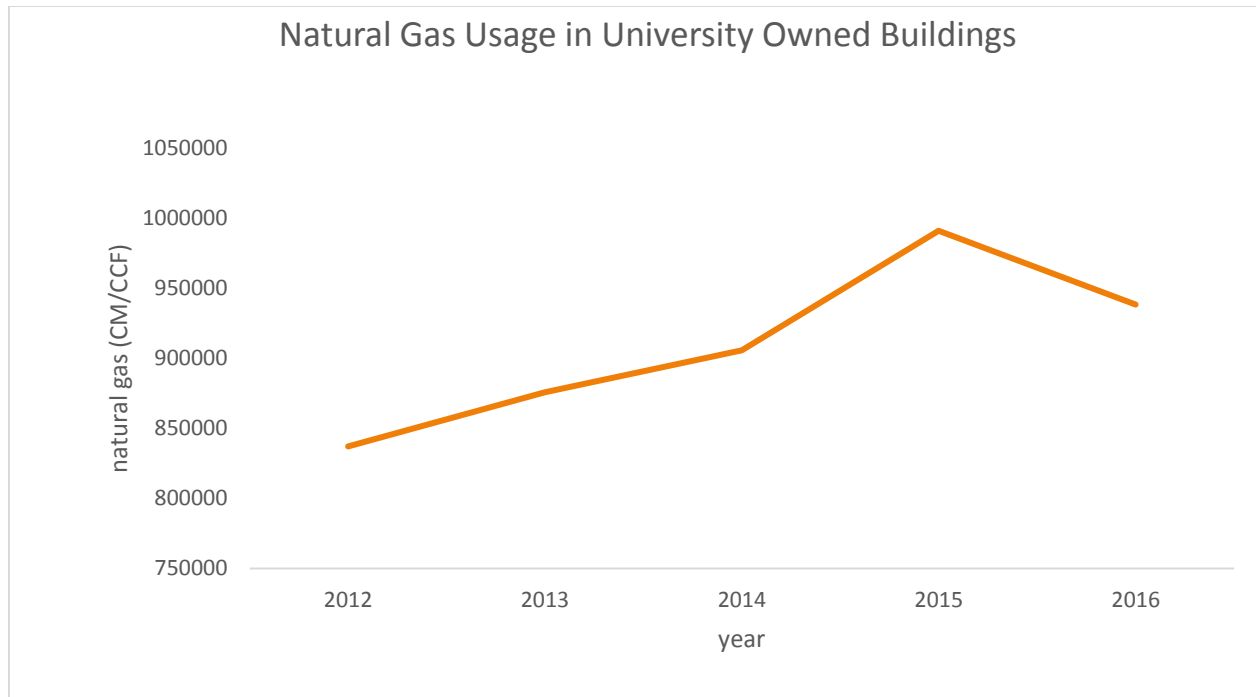


Figure 4.3.4. Usage of natural gas used in buildings owned by the University.

Over the years represented in this chart, the University has closed and built buildings on its power grid. Some buildings during this time have been closed, others have been newly built. In the past year, natural gas usage has decreased from the previous year where there was steeper increase in usage of natural gases. The University is generally using more natural gas as a result in the University no longer using bunker oil.

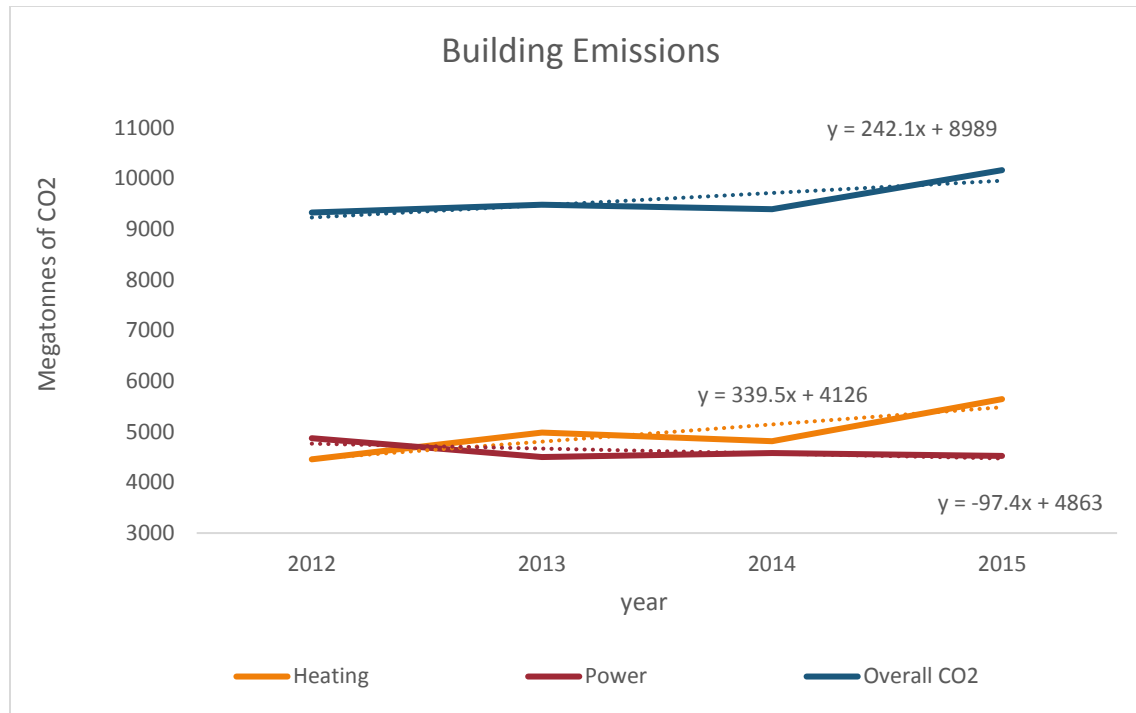


Figure 4.3.5. Carbon emissions from University buildings coupled with linear trends (dotted lines).

Overall, CO₂ emissions in buildings have increased. Emissions from power which can be implicated in electricity and energy usage has decreased by 352 Megatonnes of CO₂. This reduction can likely be attributed to energy projects having to do with mechanical maintenance. Many of the ventilation motors now have variable speeds installed so that it can controlled how much power is used in relation to heat needed. Multiple lighting retrofits during this period of time have also contributed to the decrease in emissions. Emissions from heating across campus have increased by 1189 Megatonnes of CO₂. This could likely be attributed to the fact the new Purdy Crawford Centre for the Arts Building has a larger footprint than previous buildings and has more ventilation systems and more heating requirements. The exhaust system in Barclay has been improved and as a result there is a higher volume of air that requires heating. Another contribution to this increase, though very minor in comparison is when rooms get too hot in the winter, windows are left open and heat is wasted. The same occurs when doors and windows are not properly insulated and warm air can leak out, needing more heat to keep the building warm. These were common issues brought up in Eco Rep reports throughout the winter semester of 2016 which are archived in the Ralph Pickard Bell Library. These increases and decreases balance out to an overall increase in CO₂ emissions of 837 Megatonnes.

4.4 Summary and Recommendations

Summary

The Purdy Crawford Centre for the Arts has been completed as of 2014 and should be qualified for a certification of 4 Green Globes. However, an inspection has not been completed so the certification has yet to be awarded.

Mount Allison Residence buildings won the Campus Climate Challenge meaning they had the highest drop in energy consumption during the coldest months of the year compared to many other Universities across the Maritimes. This drop in energy usage translates to reductions in carbon emissions for buildings across campus. During the campus climate challenge energy usage dropped from week 1 to week 2 1720 kW/hour in 2016. These savings translate into 0.88 metric tonnes of carbon emissions saved in only a week of a campus wide educational campaigns (Zero).

From 2012 to 2015 water usage in buildings has shown a trend in steady decline. Currently in policy 2102g, water is not considered in performance indicators, accountability and targets.

As new renovations and building projects take place, more energy efficient fixtures, infrastructure and building materials are used to replace old practices. The building facilities at Mount Allison are continuing to improve as new technologies and opportunities to implement them present themselves.

As opportunities arise, Mount Allison University implements more energy efficient fixtures and invests in some large scale renovations that save energy and funds for the University. As new technologies present themselves constantly, the University sees that they are making the best decision in terms of short term energy

savings and long term savings through infrastructure wherever possible. This particular policy encompasses many measurements that can be accounted for

Recommendations

A water calculation should be used as a measure indicated in the policy to increase accountability of resources used by campus buildings. Although Sackville is not a drought prone region, it should be noted how much water is being consumed annually by our buildings as it can have a significant impact on the environment around us as this institution uses tens of thousands of cubic metres of water a year. This metric is entirely measurable through tracking water bills from the Town of Sackville via Financial Services. As new systems are put into place such a low flowing fixtures, new heating systems, cisterns etc., the campus wide water usage will continue to decrease.

This specific policy is very broad in regards to calculated carbon emissions, especially when there is already a separate policy and a sub-policy of the environmental policy regarding emissions alone. Consider wording and specifics in the two policies for clarification and to limit redundancies. Also a goal for emissions should be made and incorporated in the strategic plan. Alternatives to natural gas usage should be explored. Also methods of reducing heat loss in buildings to avoid further rising of CO_2 emissions should be considered.

If Green Globes is being used as a metric for targets and goals, Green Globes standards should be incorporated into the indicators used to audit the Buildings Policy 2102g.

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