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Independent Study on Changing Student Behaviour to Increase Energy Sustainability and Efficiency at the Macdonald Campus of McGill University

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Abstract

This paper explores social perception towards energy consumption on Macdonald campus, as seen by different subsections of the Macdonald community: undergraduate, graduate, faculty and staff. A total of 118 community members were randomly surveyed via a semi-structured questionnaire. The main findings of our research suggest that, as a whole, community members believe Macdonald Campus to be a relatively energy-efficient place. However, results indicated a discrepancy between students and faculty/staff in terms of their perception of energy efficiency on campus. Furthermore, there was broad agreement regarding the inaccessibility of information on energy use on campus, suggesting that this was a primary leverage point for enacting social change. Various initiatives are presented that are aimed towards increasing information accessibility. With a planned implementation date of Fall 2012, these initiatives are expected to have a significant impact on environmental awareness, leading to a decrease in energy use on campus and a reduction in environmental impact.

Author's Note

We would like to thank the following people for their help during the project, their presence and guidance through our research, and all the time they spent with us and answered our questions: Professor George McCourt; Dr. Caroline Begg; Mr. Denis Mondou; Mr. Peter Knox & Jerome Conraud; Ms. Lilith Wyatt & Jennifer Dumoulin; McGill Energy Project (MEP); Harriet Kim; Committee for Environmental Responsibility, Education and Sustainability (CERES). We would also like to thank everyone who did the survey.

Keywords: Energy Consumption, Social Behaviour, Macdonald Campus, McGill University

1. Introduction

As an established institution, McGill University has numerous incentives to create a culture of sustainability and reduce energy consumption on campus. First and foremost, the impact of technical improvements can be compounded if community members similarly decrease their energy demand. Furthermore, there are undeniable environmental and social benefits: lowering energy use would decrease CO_2 emissions and lessen McGill's impact on the environment (Governors, 2010). Not only would this assist in meeting McGill's energy goals and bolster McGill's reputation as a leader in the field of sustainability (M. Luke, Fall 2011), but it would also translate to significant amounts of savings in electricity bills over time (McGill, 2010). These savings could be reinvested in energy-efficient technologies, leading to a self-sustaining loop of cost savings and energy efficiency. Hence, efforts to establish a culture of sustainability have numerous potential benefits; compared to costly investments in advanced, energy-efficient technology, they offer an alternative approach to decreasing energy consumption that is both cheap and potentially long lasting.

In 2006, a group of McGill students on Macdonald campus set the stage for a sustainable campus culture, publishing a report assessing the campus' environmental sustainability. The *Ecosystem Sustainability Assessment Macdonald Campus* focused on various aspects of environmental sustainability, including energy; apart from identifying key areas of improvement, such as the lack of sustainable technology, a dearth of meters and gauges, and wasteful social behaviour; the report also provided a detailed list of initiatives that the campus could implement to improve its energy use (N. Castellanos, Fall 2006). CERES (Committee for Environmental Responsibility, Education and Sustainability) brought these initiatives up in 2011 even as they were not explored in further detail at the time. It assigned groups of students to different sections of the report, intending to ultimately enact the recommended initiatives.

Originally intended as a follow-up to the "Energy" section of the 2006 report, our research project has since evolved to serve another purpose. Upon further research, we discovered that the majority of initiatives were already underway; be it the Macdonald Campus Energy Project or the McGill Energy Project, improvements to the technical aspects of energy use flourished. To our greatest knowledge, however, there had been no formal attempt at Macdonald campus to change social behaviour with regards to energy use. Contrary to popular belief, the 2006 report clearly indicated areas of social behaviour on Macdonald campus that were anything but environmentally friendly (N. Castellanos, Fall 2006). Hence, our research project sought to address this wasteful behaviour while filling in the absence of social initiatives for energy use.

Our research objectives were formulated with the benefits of sustainability in mind. Through interviews and surveys, we wished to gain greater insight into social perception towards energy efficiency at Mac Campus. More specifically, we wished to obtain a comprehensive understanding of whether community members were concerned with their energy use, and whether their degree of concern was reflected in their actions. Furthermore, we sought to develop effective, implementable methods of promoting energy-conscious behavior, targeting leverage points

identified by the surveys. As will be seen, our report focused on research-informed solutions to reduce energy use that could be implemented in the near future.

2. Methodology

In order to better understand the Macdonald Campus community's attitude towards energy efficiency, a survey was designed for distribution throughout the campus. The questions in the survey were designed to explore the different aspects of social perception with regards to energy efficiency. Key areas of interest included the respondent's awareness about energy efficiency, and whether this was reflected in the respondent's consumption patterns. The respondent was also asked to gauge the general culture of Macdonald Campus, and whether it was conducive to promoting energy efficiency and environmental awareness.

To maximize the number of respondents, we sought to make the survey as succinct as possible. Thus, we made extensive use of the Likert Scale, a widespread method that is used in quantifying and scaling survey responses. Likert Scales are highly useful in surveys, as they take minimal time to respond to while providing useful, quantitative results; however, their quantitative nature can prove insufficient for questions that are more nuanced. (Neil J Salkind, 2007). Hence, in areas where numerical responses were inadequate, we made use of semi-structured questions – questions with relatively open frameworks – which allowed for greater freedom of expression from respondents while still providing focused, relevant answers (Bert Klandermans, 2002). This effort to keep the survey succinct yet informative assisted our effort to obtain results, as potential surveyors were more receptive to short surveys than long ones.

Over the course of two weeks, we spent two hours per weekday gathering responses from members of the Macdonald community. The first half of this period was spent collecting data from respondents in the Link Café and Centennial Center. This was because the two locations act as focal points, with the vast majority of community members at Mac Campus passing through these areas at one point or another. Soon, however, it became evident that the vast majority of responses were solely from undergraduate students. As a means of ensuring that the data samples were representative of the community as a whole, the second week was primarily spent targeting underrepresented groups (i.e. graduates, faculty, and staff). We accomplished this by visiting areas where these members could be found such as offices, classrooms, and dorm rooms. Overall, a sizeable total of 118 survey responses were collected, with the demographic breakdown of the responses being representative of the Macdonald community.

3. Results and Discussion

The following sections will address the results for different questions in the survey (see Appendix). Each section is composed of a discussion of survey results, which can be found in the appendix.

3.1 Occupation, Fume Covers, Windows, and Recycling

Relevant questions:

- Question 1 - *Occupation*
- Question 2: *How often do you do the following on Mac Campus?*
    - *Close fume covers when not in use*
    - *Keep windows closed during winter*
    - *Sort waste into proper recycling bins*
- Question 5 - *Have you been at Mac Campus over the past 3 years?*

The survey grouped the results into four categories based on occupation: undergraduate, graduate, faculty and staff (see Figure 1.1). To ensure that the survey results were representative of the general population, we had to distribute surveys such that the number of respondents in each category was correspondent to the proportion of each group as part of the general population. While undergraduates were relatively easy to find, grad students proved to be a bit more difficult. Hence, we engaged in selective targeting at Laird Hall to increase the number of graduate students surveyed. Both staff and faculty members were also difficult to record, as most were busy and thus failed to fill out the surveys. Overall, the samples were relatively small but were reflective of the composition of Mac campus. The survey consisted of 72% undergraduates, 14% graduates, 10% staff members and 4% faculty members (compared to the Macdonald community, which is composed of 60% undergraduates, 25% graduates, 10% staff members and 5% faculty members). In contrast to the findings of the 2006 report that was mentioned before, the results indicated that the majority of community members closed fume covers and windows as needed (95% of respondents "always" or "usually" closed windows during winter, while 65% "always" or "usually" closed fume covers when not in use – see Figures 1.2 and 1.3) (N. Castellanos, Fall 2006). This suggests that, to a certain extent, there is already a preexisting culture of sustainability, as certain energy-saving habits are already ingrained in individual behavior. Similarly, a significant proportion of respondents regularly engage in recycling (86% "always" or "usually" properly sorted waste – see Figure 1.4). However, it should be noted that improvements can still be made; a waste audit done by CERES in 2011 concluded that 10% (11.72kg out of 122.37 kg of waste measured) of garbage is composed of recyclable material. Given this substantial proportion of misplaced recyclable materials, it is reasonable to conclude that proper recycling behavior must be enforced if a culture of sustainability is to flourish on campus.

3.2 Energy Efficiency and Consciousness

Relevant question:

- Question 3 - *On a scale of 1 (strongly disagree) to 5 (strongly agree), how do you feel about the following statements relating to how environmental Mac Campus is?*
    - *Mac Campus is an energy-efficient place*
    - *People at Mac Campus are conscious about their energy use*

According to the results shown in Figure 2.1, 34.15% of surveyed individuals said that the campus was relatively energy efficient, while 42.28% believed the campus to be of standard energy efficiency. While these results are seemingly inconspicuous, a deeper analysis reveals a discrepancy between the responses from the different occupational groups (See Figure 2.2). This figure reveals one startling difference: faculty members tend to perceive the campus as being energy inefficient, while students tend to think otherwise. On the other hand, the staff is split across the board, with a slight skew towards the "efficient" side. One possible explanation of this is the differences in perception between these groups. Comments left on the survey indicate a general preconception that having recycling and composting around makes the campus more energy-efficient (See Appendix 1 – Questions 3, 5, and 6). It is true that recycling and composting can reduce the carbon footprint of the campus; however, these actions alone are insufficient, and do not address the primary issue of energy efficiency. The staff and faculty, on the other hand, are more aware of energy use on campus. Faculty members are primarily responsible for running the laboratories, which are a significant source of energy consumption; many are also experts in fields related to environmental issues. Hence, it is reasonable to conclude that they possess certain awareness about an energy-inefficient side of campus that many students simply have not been exposed to. This divergence in perception towards energy efficiency may need to be remedied if sustainability efforts are to be carried out properly.

3.3 Individual Action and Your Action

Relevant question:

- Question 4 - *On a scale of 1 (not important at all) to 5 (extremely important), how do you feel about the following statements relating to sustainability?*
    - *How important is individual action in promoting sustainability (as opposed to institutional action)?*
    - *How important do you believe your actions are in promoting sustainability?*

This question of individual action vis-à-vis sustainability yielded very interesting results. It was expected that respondents would believe individual action to be important, and this was demonstrated in Figure 3.1; however, the perception of individual importance was significantly downplayed once personal action was called into question (See Figure 3.2). This indicates that a significant proportion of the community believes individual action to be important, whereas personal action is not. An implication of this double standard is that calls for action based solely on environmental arguments may not be enough; some may agree that individual contributions are needed, but refuse to take personal action under the premise that their own actions are irrelevant.

3.4 Accessibility of Information

Relevant question:

- Question 7: *On a scale of 1 (not accessible at all) to 5 (extremely accessible), how accessible is information on energy efficiency developments at Mac Campus?*

Reponses indicated that most people at Macdonald campus do not know about energy efficiency developments on campus (See Figure 4.1). This was reflected during our discussions with various individuals; the majority of people were unfamiliar with initiatives like the Macdonald Energy Project and the McGill Energy Dashboard. This lack of accessibility to information can prove problematic in establishing a culture of sustainability as it may hinder individual action. Passionate individuals willing to contribute to environmental movements on campus may find themselves in a state of inaction, simply because they do not know what options and initiatives are available. These results suggest that the general lack of awareness about environmental initiatives is a significant hindrance to environmental action within the campus.

3.5 Mac vs. Home

Relevant question:

- Question 8: *Relative to your behavior at home, are you more or less conscious about your energy use when on Mac Campus?*

The majority of people surveyed indicated that they are not more conscious about energy use at Mac (See Table 5.1). Combined with the results from Figure 2.3, which indicated that people at Mac are more energy conscious, this implies that community members apply their studies to their daily lives at home. Such a finding is quite important, as it further compounds the necessity to establish a culture of sustainability on campus. If the culture at Macdonald Campus were to condone blatant energy inefficiency, such actions would have far-reaching impacts that stretch beyond the boundaries of the campus.

3.6 Green Activities

Relevant question:

- Question 9: *Please list any green activities at Mac Campus dealing with student life that you are familiar with, and indicate how often you take part in the activity on a scale of 1 to 5.*

Table 6.1 illustrates all the activities that people on campus consider to be environmentally friendly. The most common activities are composting and recycling. While this may initially seem encouraging, it should be noted that most people selected the value 3 for composting, meaning that they don't compost all the time. This is in accord with results from a Gorilla Composting waste audit, which indicated that up to 48% of all material in garbage bags were compostable (CERES,

2011). This suggests that, if done properly, initiatives that are designed to increase awareness and enforce proper sorting behavior would have pronounced effects.

Question 9 also casts light on the perception issue. As demonstrated, people believe that the most prominent "green" actions that they can engage in on campus are composting and recycling. Unfortunately, these behaviors, while important, are not enough. Recycling – and to a lesser extent, composting – is considered by many to be customary in this day and age.

4. Solutions and Initiatives

Apart from commenting on energy use at Macdonald Campus, one of the primary aims of this report is also to provide ways of influencing social behavior to decrease energy use. Based on an ENVR 401 project conducted in Fall 2011, this objective is achievable given the use of proper methods, but there will be obstacles. It should be noted that the project listed "education," "competition," and "incentives/disincentives" as the most effective ways to change behavior (M. Fabian, 2011). Taking their recommendations and our survey results into account, we have proposed solutions with two primary goals in mind: raising awareness and encouraging personal motivation. As elaborated below, we believe that both objectives are key to furthering a culture of sustainability on campus.

4.1 Awareness

Based on survey responses, it appears that efforts towards sustainability are substantially hindered by a general lack of awareness. As discussed in sections 1, 2, and 4, the Macdonald community is fairly conscious about energy consumptionbut does not have the information necessary to improve its energy footprint. In addition, results from section 6 indicate that community members are not entirely aware of environmental groups on campus. Given that awareness is the first step to influencing social behavior, it is imperative to publicize information on environmental initiatives and energy use. By informing and educating the Macdonald community about sustainability initiatives, we would be able to dispel any misconceptions about the campus' current environmental state and encourage community members to get more involved. The following are some proposals to raise awareness of Macdonald campus' energy consumption, with the end goal of influencing behaviour and decreasing energy use.

Firstly, we believe that "One-Day-A-Month" awareness events are effective remedies to the situation. As the name suggests, the campus could host monthly events featuring different energy or environmental issues, providing information that community members would need in order to get involved (as indicated by the results of section 4). By encouraging cooperation between staff, faculty, and environmental groups on campus, these events would facilitate dialogue within the Macdonald community, lessening the discrepancies in the perceptions of campus energy efficiency (as shown in section 2). Furthermore, by emphasizing the value of individual action in reducing energy use, these events could effectively galvanize community members to get personally involved, fostering the culture of

sustainability from ground-up. A list of eight theme ideas can be found in the appendix.

Aside from creating new initiatives on campus, it is also important to utilize existing resources on campus and realize their full potential. In recent years, McGill has begun to improve its transparency by developing the McGill's Energy Dashboard, a comprehensive energy monitoring system that measures daily energy use on a per-building basis. Despite its immense academic and environmental value, few people are aware of its existence, let alone its potential in informing the community of energy issues. Hence, to improve access, we recommend that the Energy Dashboard be advertised through the various forms of media available on campus. Television sets on campus could broadcast information on the Energy Dashboard in key locations, providing real-time statistics to keep community members aware and informed of energy use. Concurrently, the campus' Environmental Advisor could also use this to monitor energy consumption, alerting the community when particular situations arise.

The dynamic and ever-changing nature of the Macdonald community offers yet another opportunity to raise awareness and establish a culture of sustainability. Prospective and newly accepted students are eager to learn about what the "agricultural and environmental campus of McGill" has to offer. As such, we propose a green orientation event, consisting of a succinct presentation on environment-related resources available on campus – green initiatives, courses, and environmental groups – that students may be interested in. Be it fast facts on the campus' energy use or discussions on individual behaviour and energy consumption, the orientation would cover a broad range of environmental topics to promote general environmental awareness on campus. We are confident that this event will disseminate needed information (as seen in section 4) and promote active participation in the variety of green initiatives available on campus. Ultimately, we believe that the aforementioned proposals are effective vehicles for change, driving us towards a more sustainable future.

4.2 Personal Motivation

While raising awareness is an essential step towards fostering a culture of sustainability, it fails to translate into tangible results if community members lack personal motivation to get involved. Thus, it is equally vital to ensure that individuals understand the importance of personal action in environmental efforts. As demonstrated in section 3, a substantial proportion of the Macdonald community appear to downplay the value of personal involvement in energy initiatives; while previous proposals may remedy this flawed perception, they do not give this topic the attention that it deserves. With this in mind, the following activities will focus on demonstrating the value of personal involvement: competitions, incentives and disincentives.

Harnessing the potential of friendly competition is one way of improving personal motivation. By creating a competition on reducing energy use, Macdonald community members would be motivated to engage in energy-conscious behaviour, learning first-hand the individual impacts on energy consumption while generating immediate results. Both inter- and intra-university competitions can be organized; by

collaborating with inter-university groups and applying tools like the McGill Energy Dashboard, McGill can face off against other Montreal universities as they race to achieve the greatest proportional drop in energy consumption within a predetermined amount of time. In a similar fashion, this idea could be applied within McGill's own boundaries by having the Macdonald Campus challenge the Downtown Campus. An alternative competition proposal would be to design an obstacle course as part of Frosh orientation. By incorporating engaging challenges that promote environmental awareness, such as racing to sort waste into proper bins or cartwheeling compost across campus, the competition would reiterate the value of individual action and encourage environmentally-friendly behavior within the campus community. Given that community members usually simulate their behaviour on campus at home (as indicated in section 5), campus-wide initiatives that encourage energy and environmental awareness are likely to have spillover benefits within households as well.

Aside from competitions, incentives and disincentives would also be effective means of promoting personal motivation and involvement (M. Fabian, 2011) as they clearly demonstrate the impacts of individual action. As stated earlier, this would address the individual's personal detachment from environmental responsibility as highlighted in section 3. One potential proposal, then, is to have residences place a cap on energy use for individual students; if a room's energy consumption goes above the cap, the occupants would be billed that amount in their next rent payment. The main challenge with this particular idea, however, is that residences on campus do not have the proper energy meters in place to measure consumption on a room-by-room basis. Without the ability to measure individual energy use, it would be difficult to properly distribute incentives or disincentives. Hence, as supported by interviews with the residential housing office, said incentive/disincentive approach is unlikely to work until energy-recording equipment of high resolution is placed on campus. Nonetheless, the potential of incentives and disincentive in reducing energy consumption and fostering a culture of sustainability should not be overlooked.

5. Conclusion

Much was learned about energy use and fostering sustainability on campus. This research project illuminated the status quo on Macdonald campus – an ironic phrase, perhaps, considering that "obliviousness" is likely the most befitting term to describe the community's attitude towards sustainability initiatives. This is clearly demonstrated in the survey results. For example, based on section 2, students showed a proclivity to characterize the campus as being environmentally friendly; however, this view was not shared by faculty and staff, who are more acquainted with the inner workings of the campus and are thus more aware of its sheer energy consumption. This observation is further supported by the results of section 4 and 6; community members generally felt that there was limited accessibility to information pertaining to sustainability initiatives, and were consequently unable to list the multitude of initiatives present on campus. Many written responses bolstered our findings, with some explicitly stating that they were unaware of the happenings and green events going on at campus. Simply put, the lack of awareness is arguably the

greatest hurdle to developing a culture of sustainability on campus, and should be a primary leverage point to enact behavioral change.

This is not to say, however, that the future of sustainability initiatives on campus is bleak. On the contrary, there exists a multitude of projects that are underway across the campus. Clubs such as Gorilla Composting and CERES (Comité Étudiant pour une □esponsabilité Environnementale et Sociale) are reaching out to students, seeking to integrate sustainability into their everyday lives. As evidenced by the existence of the McGill Energy Dashboard and the Macdonald Campus Energy Project, members of the administration are working diligently to establish energy-efficient infrastructure crucial to the sustenance of a culture of sustainability. Furthermore, as shown through findings in section 7, the community appears to be quite receptive to environmental initiatives, and has indicated a willingness to learn and adapt to sustainability initiatives if given the information and opportunity. Apathy and inaction do not seem to be the main problem; rather, survey results suggest (as discussed in Section 2 and 4) that communication and awareness are the elements most in need. As our proposed solutions have yet to be carried out, their efficacy at improving environmental awareness is ultimately unknown. Nonetheless, based on our findings, it is reasonable to conclude that initiatives designed to enhance the accessibility of information are likely to have a substantial impact on energy use on campus. What Macdonald campus needs most, then, are seeds of communication to help the garden of sustainability grow.

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Appendix

Table of Contents

APPENDIX I
QUESTIONNAIRE
Questionnaire on Energy Use at Mac Campus
-Filling out and returning the survey is implicit consent-

1. **Occupation:** Undergraduate Student Graduate Student Faculty Staff

2. How often do you do the following on Mac Campus?

	NA	Never	Rarely	Sometimes	Usually	Always
Close fume covers when not in use	0	1	2	3	4	5
Keep windows closed during winter	0	1	2	3	4	5
Sort waste into proper recycling bins	0	1	2	3	4	5

3. On a scale of 1 (strongly disagree) to 5 (strongly agree), how do you feel about the following statements relating to how environmental Mac Campus is?

Mac Campus is an energy-efficient place. 1 2 3 4 5

People at Mac Campus are conscious about their energy use. 1 2 3 4 5

Please state your reason for giving the above ratings:

4. On a scale of 1 (not important at all) to 5 (extremely important), how do you feel about the following statements relating to sustainability?

How important is individual action in promoting sustainability (as opposed to institutional action)? 1 2 3 4 5

How important do you believe your actions are in promoting sustainability? 1 2 3 4 5

5. Have you been at Mac Campus over the past 3 years?
Yes No
If yes, please answer the following question:

Over the past 3 years, has the degree of energy/environmental consciousness at Mac campus increased, decreased, or stayed the same? Please explain.

6. On Mac Campus, are there any areas of energy use in particular need of improvement?

7. On a scale of 1 (not accessible at all) to 5 (extremely accessible), how accessible is information on energy efficiency developments at Mac Campus?

1 2 3 4 5

8. Relative to your behavior at home, are you more or less conscious about your energy use when on Mac Campus?

Less Conscious	**Somewhat less**	**No Difference**	**Somewhat more**	**More Conscious**
1	2	3	4	5

9. Please list any green activities at Mac Campus dealing with student life that you are familiar with, and indicate how often you take part in the activity on a scale of 1 to 5.

	Not Applicable	**No impact at all**	**Barely any impact**	**Some impact**	**Quite a bit of impact**	**A lot of impact**
_____	0	1	2	3	4	5
_____	0	1	2	3	4	5
_____	0	1	2	3	4	5
_____	0	1	2	3	4	5
_____	0	1	2	3	4	5

10. If an information session about green initiatives available at Mac was hosted during your orientation session, how likely would you have been to attend?

Not Applicable	Not likely at all	Barely likely	Somewhat likely	Likely	Very likely
0	1	2	3	4	5

CERTIFICATE OF ETHICAL ACCEPTABILITY

Research Ethics Board
Faculty of Agricultural and Environmental Sciences

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www.mcgill.ca/macdonald/research/compliance/human/

Certificate of Ethical Acceptability
Research Involving Humans

REB File #: 977-0212

Project Title: *Independent Study on Changing Student Behaviour to Increase Energy Sustainability and Efficiency at the Macdonald Campus of McGill University*

Principal Investigator: Peter Tikasz
Co-Investigators: Andrew Wu
Jaaved Singh

Department: School of Environment

Status: Undergraduate Students

Supervisor: Georges McCourt, Faculty Lecturer

Funding Agency and Title: N/A

This project was reviewed and approved by

Expedited Review ✓
Full Review

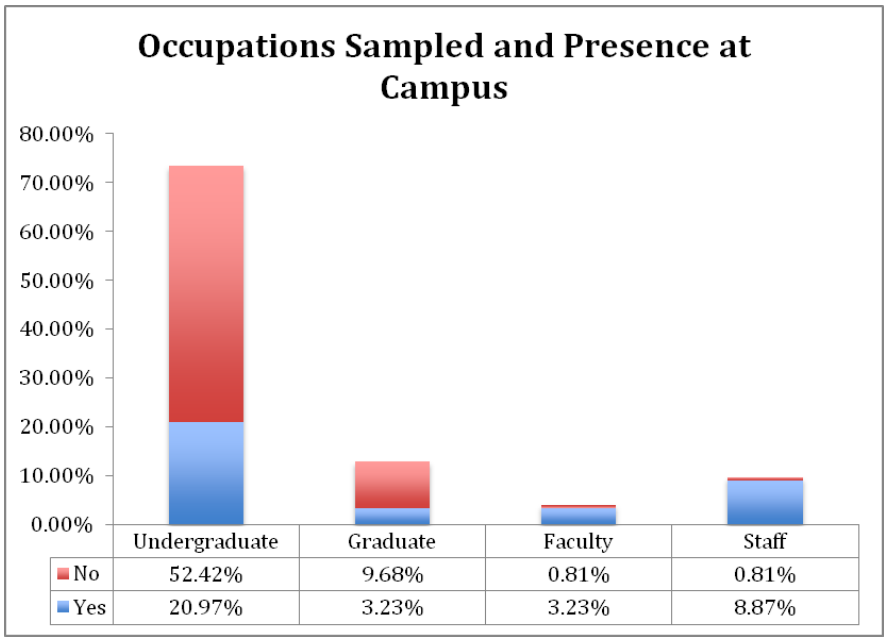
Elias Georges, Interim Chair
REB, Faculty of Agricultural and Environmental Sciences

Approval Period: March 14, 2012 to March 13, 2013

This project was reviewed and approved in accordance with the requirements of the McGill University Policy on the Ethical Conduct of Research Involving Human Subjects and with the Tri-Council Policy Statement: Ethical Conduct For Research Involving Humans

*All research involving human subjects requires review on an annual basis. A Request for Renewal form should be submitted at least one month before the above expiry date.
*If a project has been completed or terminated and ethics approval is no longer required, a Final Report form must be submitted.
*Should any modification or other unanticipated development occur before the next required review, the REB must be informed and any modification can't be initiated until approval is received.

APPENDIX II
Section 1: Occupation, fume covers, windows, and recycling



	Undergraduate	Graduate	Faculty	Staff
No	52.42%	9.68%	0.81%	0.81%
Yes	20.97%	3.23%	3.23%	8.87%

Figure 1.1: (Question 1 and 5) Respondents classified according to their occupation and their response to question 5. Respondents that have been on Macdonald campus for 3 or more years were placed in the "Yes" category, and the "No" category otherwise.

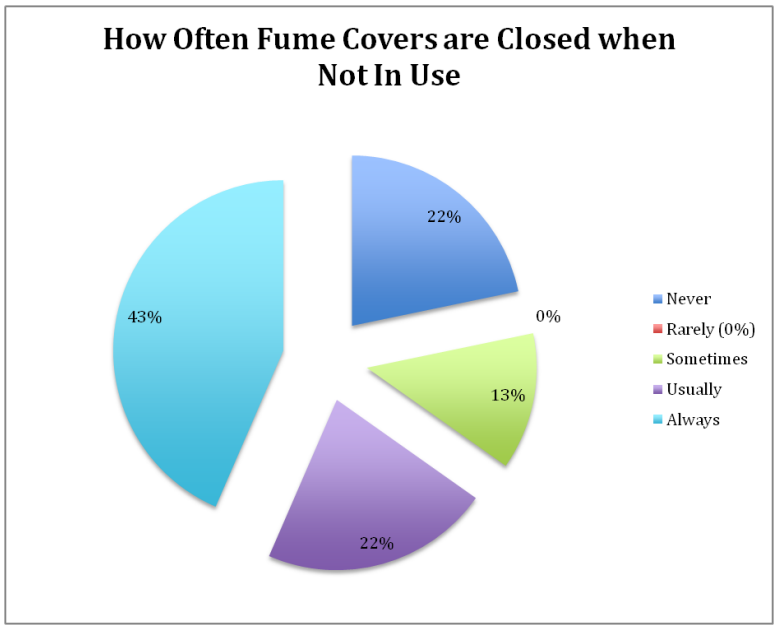


Figure 1.2: (Question 2) Reponses regarding the relative frequency of closing fume covers when not in use. The results represent a cumulative answer from all occupations.

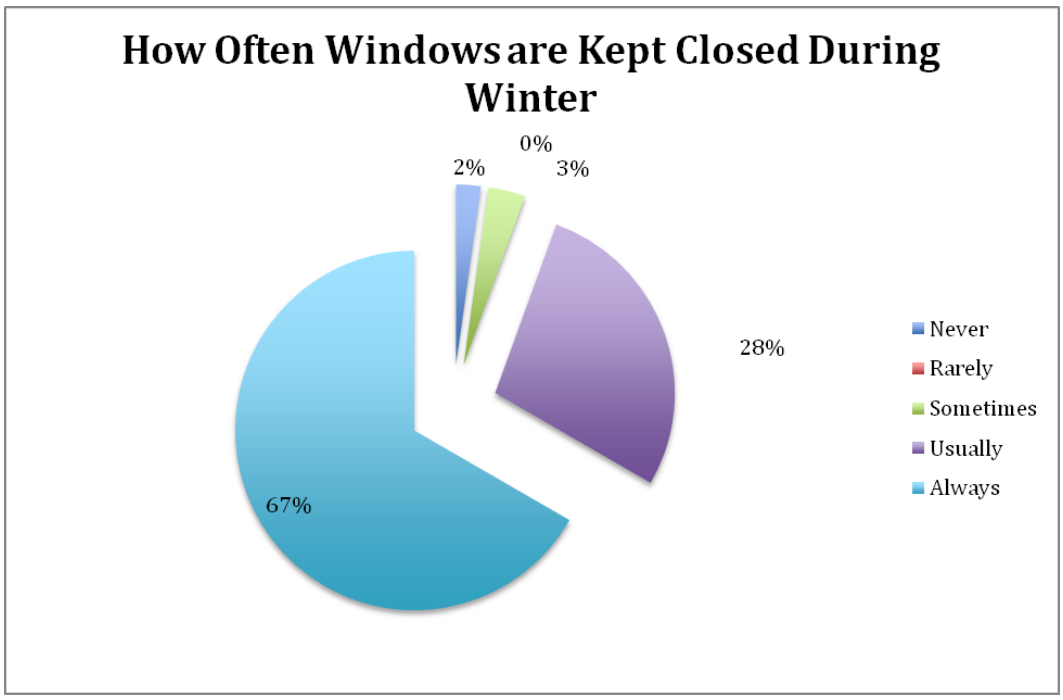


Figure 1.3: (Question 2) Reponses regarding the relative frequency of keeping windows closed during winter. The results represent a cumulative answer from all occupations.

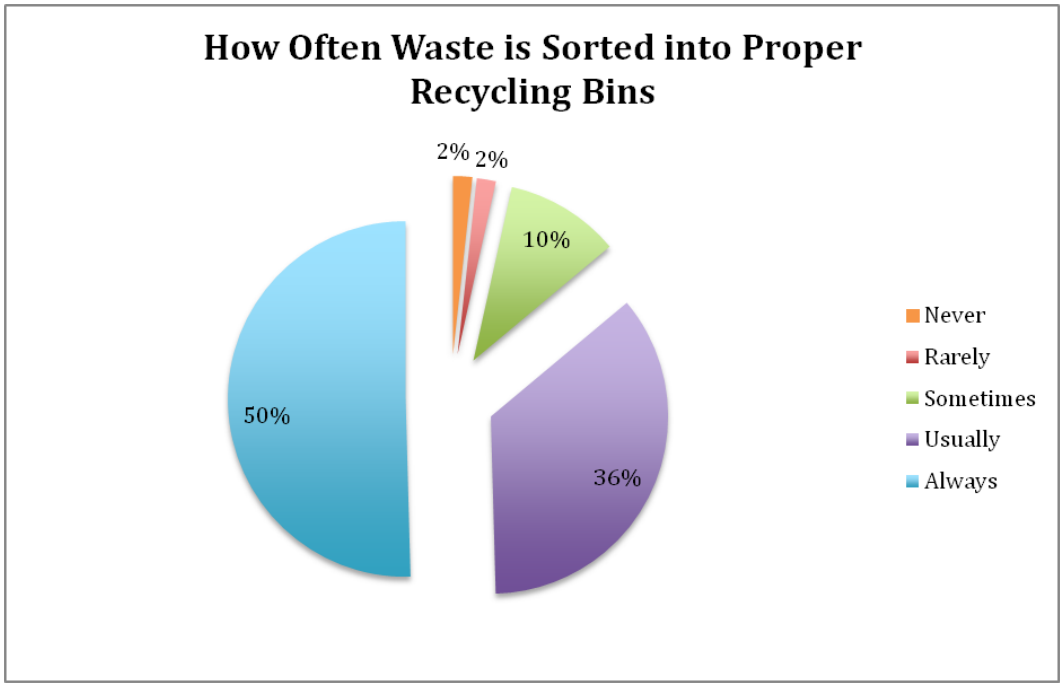


Figure 1.4: (Question 2) Reponses regarding the relative frequency of sorting waste into the proper bins. The results represent a cumulative answer from all occupations.

Section 2: Energy efficiency and consciousness

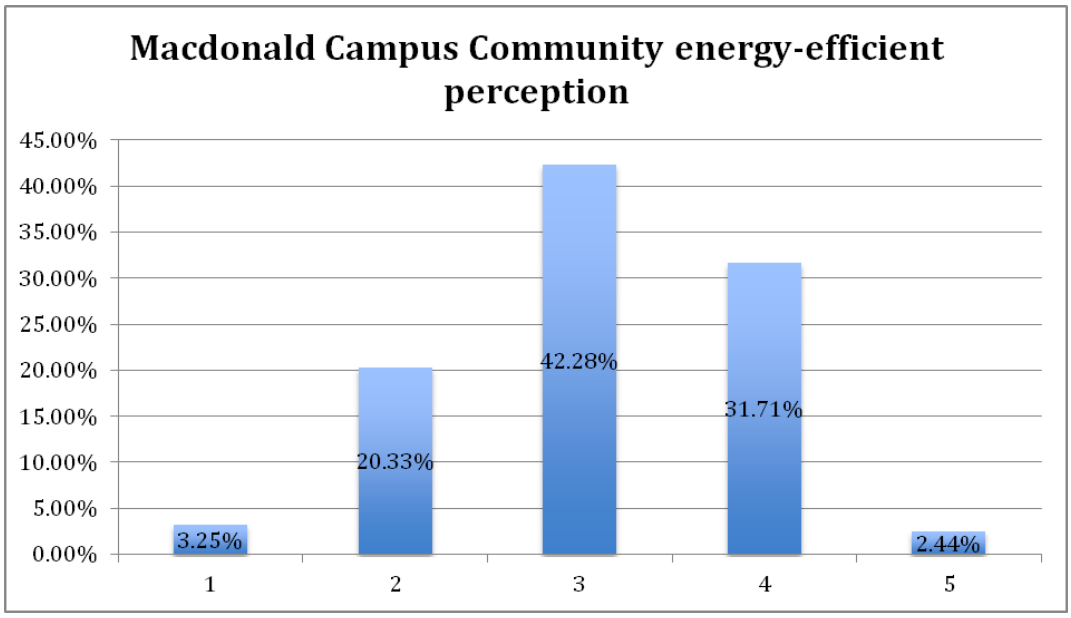
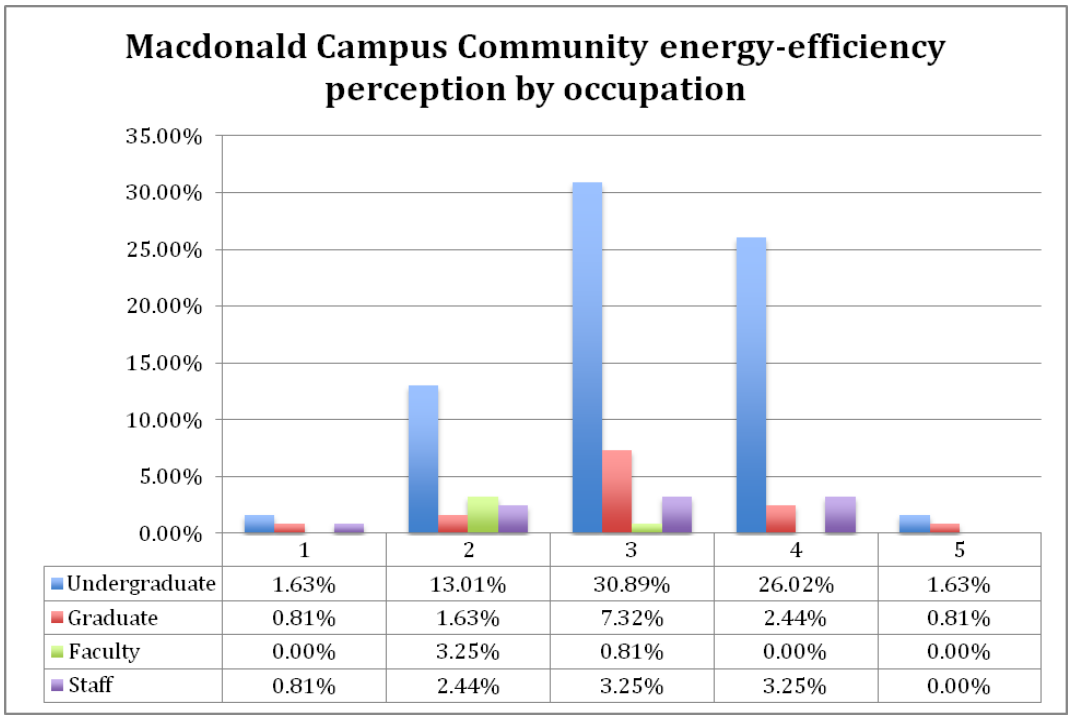
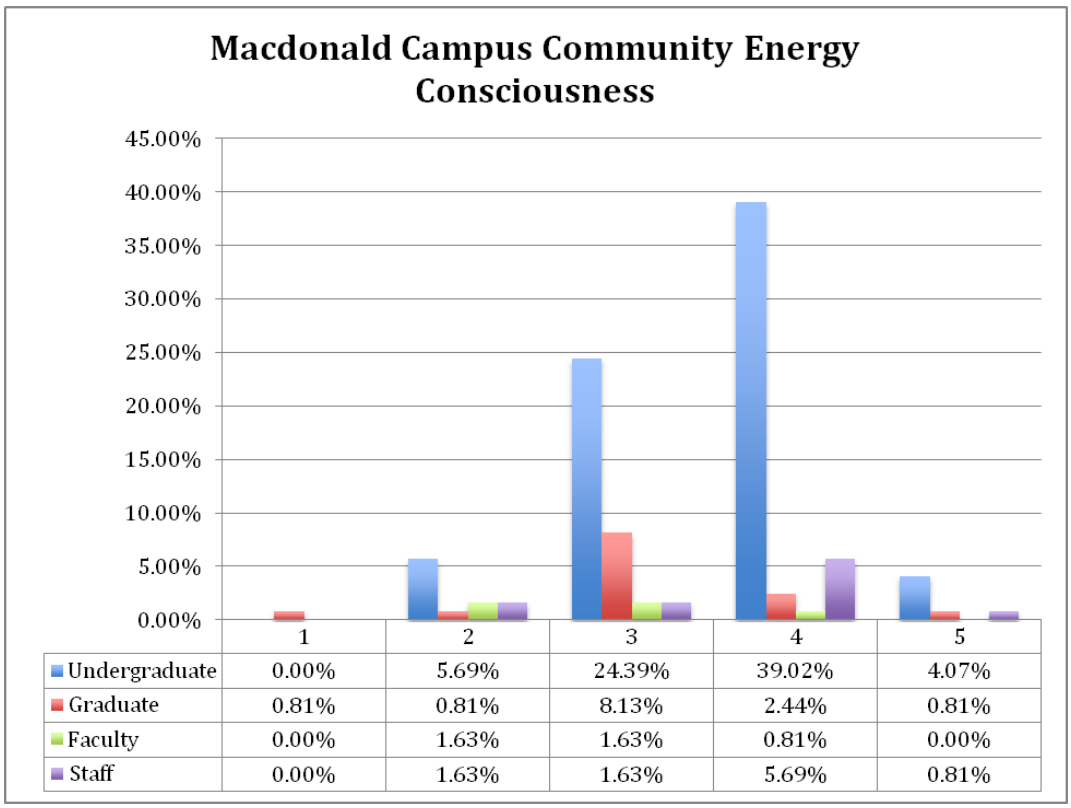


Figure 2.1: (Question 3) Macdonald campus' perceived energy efficiency, on a scale of 1 (a perception of low energy efficiency) to 5 (a perception of high energy efficiency).



	1	2	3	4	5
Undergraduate	1.63%	13.01%	30.89%	26.02%	1.63%
Graduate	0.81%	1.63%	7.32%	2.44%	0.81%
Faculty	0.00%	3.25%	0.81%	0.00%	0.00%
Staff	0.81%	2.44%	3.25%	3.25%	0.00%

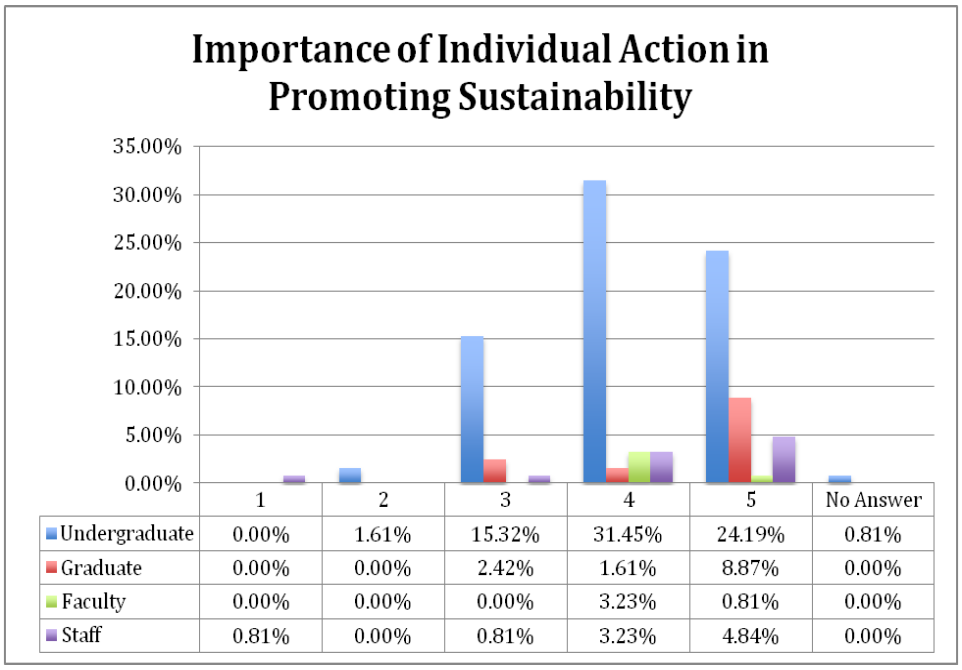
Figure 2.2: (Question 3) Macdonald campus' perceived energy efficiency on a scale of 1 (a perception of low energy efficiency) to 5 (a perception of high energy efficiency), broken down into respective occupational groups.



	1	2	3	4	5
Undergraduate	0.00%	5.69%	24.39%	39.02%	4.07%
Graduate	0.81%	0.81%	8.13%	2.44%	0.81%
Faculty	0.00%	1.63%	1.63%	0.81%	0.00%
Staff	0.00%	1.63%	1.63%	5.69%	0.81%

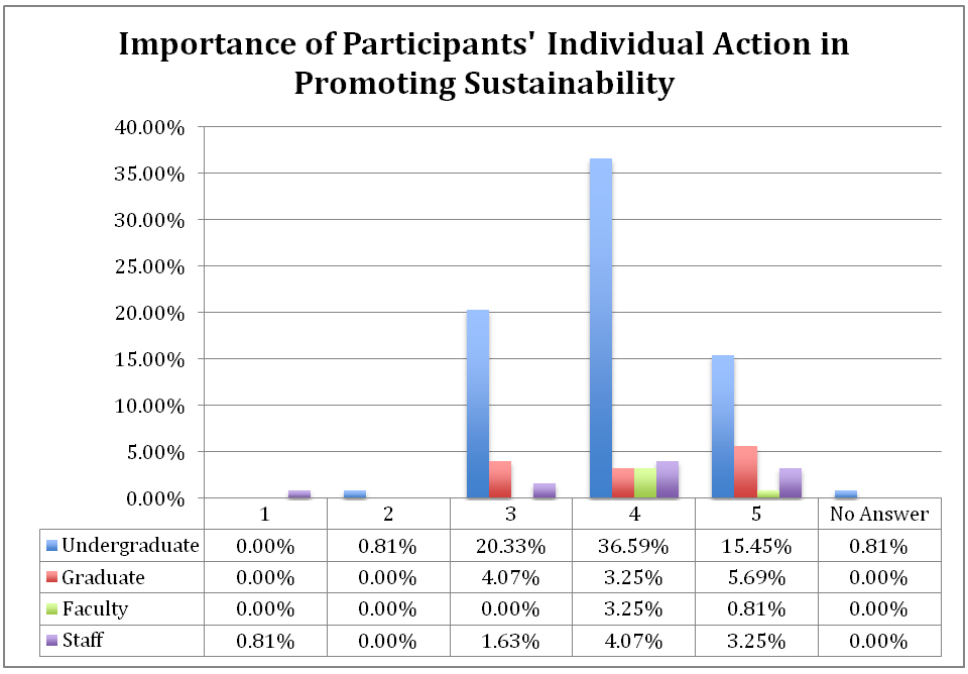
Figure 2.3: (Question 3) Macdonald campus community's perceived energy awareness, on a scale of 1 (a perception of low energy awareness) to 5 (a perception of high energy awareness), broken down by occupation.

Section 3: Individual Action and Your Action



	1	2	3	4	5	No Answer
Undergraduate	0.00%	1.61%	15.32%	31.45%	24.19%	0.81%
Graduate	0.00%	0.00%	2.42%	1.61%	8.87%	0.00%
Faculty	0.00%	0.00%	0.00%	3.23%	0.81%	0.00%
Staff	0.81%	0.00%	0.81%	3.23%	4.84%	0.00%

Figure 3.1: (Question 4) The importance of individual action in promoting sustainability, on a scale of 1 (no importance) to 5 (high importance), broken down by occupation.



	1	2	3	4	5	No Answer
Undergraduate	0.00%	0.81%	20.33%	36.59%	15.45%	0.81%
Graduate	0.00%	0.00%	4.07%	3.25%	5.69%	0.00%
Faculty	0.00%	0.00%	0.00%	3.25%	0.81%	0.00%
Staff	0.81%	0.00%	1.63%	4.07%	3.25%	0.00%

Figure 3.2: (Question 4) The importance of survey respondents in promoting sustainability through their own actions, on a scale of 1 (no importance) to 5 (high importance), broken down by occupation.

Section 4: Accessibility of information

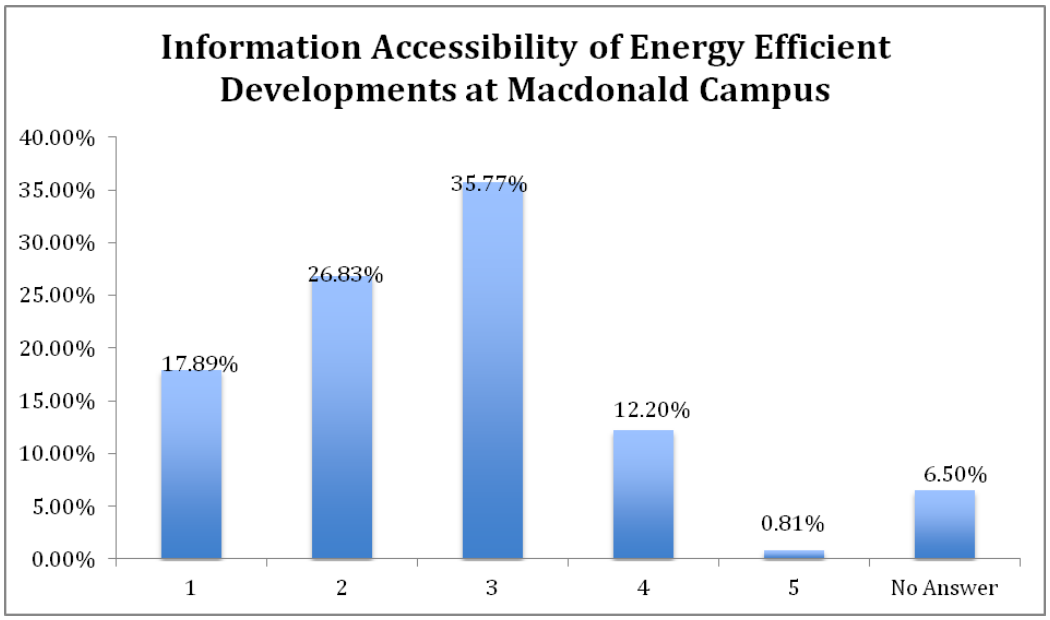


Figure 4.1: (Question 7) Accessibility to information regarding energy efficiency developments on Macdonald campus, on a scale of 1 (not accessible at all) to 5 (extremely accessible). The results represent a cumulative answer from all occupations.

Section 5: Macdonald Campus vs. Home

More conscious or less conscious about energy use

	1	2	3	4	5	No Answer
Undergraduate	1.63%	8.94%	41.46%	19.51%	1.63%	--
Graduate	--	2.44%	4.07%	1.63%	4.07%	0.81%
Faculty	--	1.63%	2.44%	--	--	--
Staff	0.81%	1.63%	5.69%	--	--	1.63%
TOTAL	2.44%	14.63%	53.66%	21.14%	5.69%	2.44%

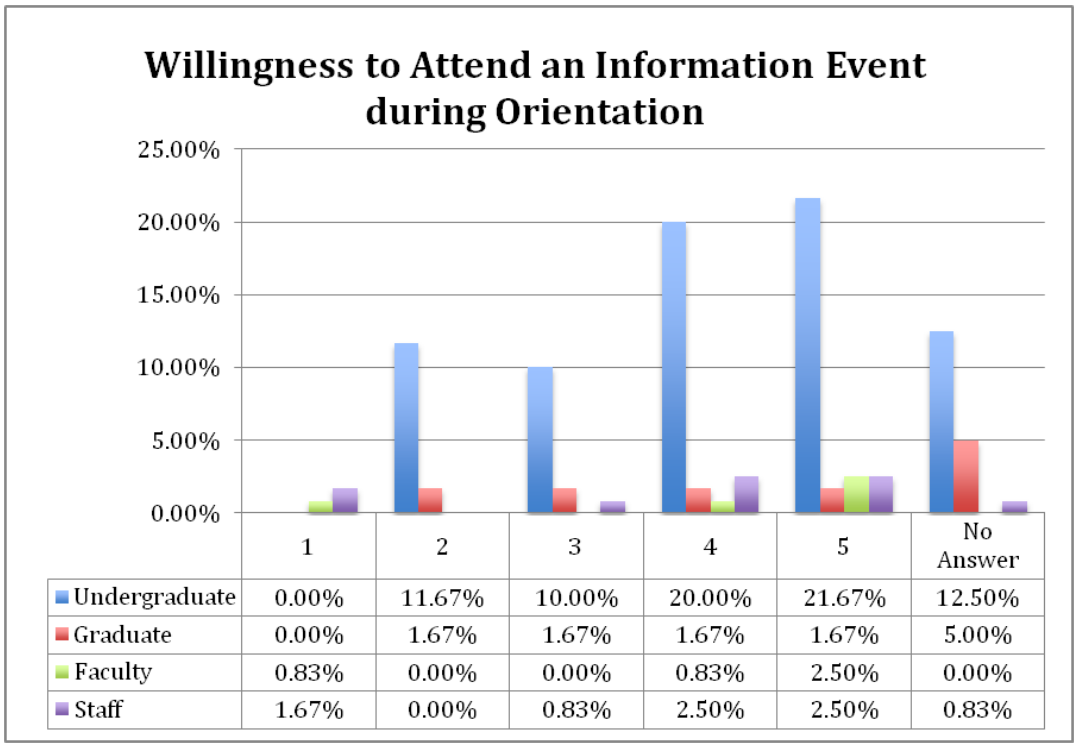
Table 5.1: (Question 8) Breakdown of relative energy consciousness by occupation. The scale is from 1 (less conscious) to 5 (more conscious).

Section 6: Green Activities

	0	1	2	3	4	5
Compost	0.71%	5.00%	0.71%	19.29%	12.86%	6.43%
Recycling	0.00%	0.00%	0.00%	3.57%	10.71%	10.71%
Farm	0.00%	0.00%	0.00%	1.43%	0.00%	0.71%
Compost (Link Cafe)	0.00%	0.00%	0.00%	0.00%	0.71%	0.00%
MSEG	0.00%	0.00%	1.43%	0.00%	0.00%	2.86%
Food Box	0.00%	0.00%	0.00%	0.00%	0.71%	0.00%
Transportation (Shuttle & Free Bike)	0.71%	0.00%	0.00%	0.71%	1.43%	2.14%
Bring Your Own Plate	0.00%	0.00%	0.71%	0.00%	0.00%	0.00%
Happy Belly	0.00%	0.00%	1.43%	2.14%	0.71%	0.71%
CERES	0.00%	0.00%	0.00%	2.14%	0.00%	0.71%
Out of the Garden	0.00%	0.00%	0.00%	0.71%	0.71%	2.14%
Use Stairs	0.00%	0.00%	0.00%	0.00%	0.00%	0.71%
Turn Off Lights	0.00%	0.00%	0.00%	0.00%	0.00%	0.71%
Hug Your Mug	0.00%	0.00%	0.00%	0.71%	0.71%	0.00%
Eco Rez	0.00%	0.00%	0.00%	0.71%	0.00%	0.00%
Mac Market	0.00%	0.00%	0.00%	0.71%	0.71%	0.00%

Table 6.1: (Question 9) The table enumerates actions and initiatives on campus that are considered to be "green." It also indicates the proportion of total respondents that participate in the action/initiative at a particular frequency, 1 (Never participate) to 5 (Frequently participate).

Section 7: Information Event



	1	2	3	4	5	No Answer
Undergraduate	0.00%	11.67%	10.00%	20.00%	21.67%	12.50%
Graduate	0.00%	1.67%	1.67%	1.67%	1.67%	5.00%
Faculty	0.83%	0.00%	0.00%	0.83%	2.50%	0.00%
Staff	1.67%	0.00%	0.83%	2.50%	2.50%	0.83%

Figure 7.1: (Question 10) Willingness to attend an informational event during Orientation, on a scale of 1 (not accessible at all) to 5 (extremely accessible).

APPENDIX III
One Day A Month Awareness Event

- An exhibition of lights would be set in the MS (Macdonald-Stewart building) Foyer, using a predetermined amount on energy that would be put on display. This would help provide a visualization of energy use on campus, and could potentially reflect the energy used in at least one building on campus.
- To bring awareness to water consumption, a shower will be displayed in the foyer, along with relevant figures on daily water use. Numerous options for the figures could be used, such as national averages from government databases or estimates from Macdonald campus' pipelines.
- To help combat bottled water use on campus, a figure made of plastic water bottles will be constructed; this figure would hold a single refillable water bottle to represent the amount of plastic that could be saved.
- Regarding the misplacement of plastic into garbage bins, instead of recycling bins, (Gorilla Composting waste audit), a display would be designed to illustrate the volume of mishandled plastic.
- A flash mob event will be planned to highlight the water bottle refill stations available to students. CERES in co-ordination with CENEM hosted this event for the 2011-2012 year.
- To illustrate energy use, AA batteries will be used to show the energy use of iPods, cell phones, computers and dryers. As each battery represents a certain amount of energy, estimates of appliance energy use would be represented using the equivalent number of batteries.
- Another event would focus on presenting the proportion of energy delivered to the campus from various energy sources. This is also to illuminate the fact that the campus has yet to reach its mandate of being powered by 90% renewable energy; it is currently sitting around 30% instead (R. Proulx, 2012).
- The final event planned would be a map of the campus, warped so that each building is represented according to its energy use – i.e. The Macdonald-Stewart building would be the largest building on the map (R. Proulx, 2012).