



Alberta Post-Secondary: Greening Initiatives

A survey of sustainability on Alberta campuses



Spring | **2011**

Acknowledgements

I would first like to thank the YMCA Youth Eco Internship Program, funded by the Government of Canada's Economic Action Plan. Without their funding, this research project would not have been made possible.

Special acknowledgements must also be given to Keith Andony, manager at The Students Association of Grant MacEwan University, and the entire association as a whole for providing me the support, resources, and office space to allow me to conduct my research.

Thank you to all of the department/faculty staff and Student Association members of the 10 campuses for taking the time and valuable efforts into conducting my survey. Without your time, my research would not have been made viable. Appreciation should also be given to the campuses that did not complete my survey but did take the valuable time to respond to my constant emails and phone calls to provide me with a reasonable response.

Lastly, I also wish to thank Carol Neuman, Executive Director at The Alberta Students' Executive Council for providing me with direction, guidance and helpful advice through the course of my research. In particular, Carol Neuman has taught me valuable writing and research techniques. With her sound advice and reputedly strong voice in the organization, I was able to have more institutions respond to my questionnaire while allowing my research to progress in a smooth and efficient manner.

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Executive Summary

This research report examines the environmental sustainability initiatives of ten post-secondary institutions across Alberta, and provides critical, evidence-based recommendations for better environmental stewardship of our province's expanding higher education sector.

In our first chapter, we **review the literature** on campus-based environmental sustainability initiatives. In Chapter 2, we outline the **research strategies** and questionnaire used to engage participating campuses on five critical areas pertaining to campus wide environmental sustainability. In Chapter 3, we plot the **results** from our 38 questions into bar and pie graphs, highlighting defining patterns and notable responses. We then **provide political, economical, social, and technological analysis** of our results, and evaluate our respondents' **strengths, weaknesses, opportunities, and threats** to continued greening initiatives.

A number of key findings emerge across three axis: **policies and practices; environmental auditing;** and **Offices of Sustainability**. We discover that most campuses do not have an environmental audit or a pledge to a formal declaration in environmental stewardship; many campuses lack partnerships with businesses, organizations, and/or government programs to promote stewardship. While several campuses have programs curbing energy, wastes, and water level costs through various building retrofit, they lack the proper environmental audits to gauge their progress. Significantly, many participating Alberta campuses do not have a dedicated Office of Sustainability.

But we also discover a growing appetite for stronger stewardship of on-campus sustainability. On the ground, we see that all of the campuses surveyed are **committed to empowering students** to take ownership of sustainability initiatives. And, from a governance perspective, there are limitless opportunities for the Government of Alberta to **articulate a vision, show leadership and establish best practices** in order for Campus Alberta to become a leading example of on-campus sustainability.

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Introduction

Over the past decade, sustainability has emerged as a dominant, organizing theme for post-secondary institutions, and schools across Canada have made great strides to realign campus values with environmental sustainability. This is of increasing importance for the 21st century post-secondary institution – as enrollment continues to grow, so will spending on educational budgets and impacts on our planet’s resources. As M’Gonigle and Starke (2006) relay, post-secondary institutions are a global force that is intimately involved with, and implicated in, the profound changes shaping the world. Their research indicates that in 2004-2005 over a million students were registered in Canadian post-secondary institutions with an expected increase of 30% over the next 10 years (M’Gonigle & Starke, p 35).

Alberta will not be immune to increased demand for post-secondary education. Based on a report conducted by the Alberta Government, Alberta likewise, has seen similar trends with notable increases in high school to post-secondary transition rates from 2004 to 2008 (Accountability Pillar Results for Annual Education Results Report, 2009, p 178). But for the positive impacts attendant with these trends, there is one area of growing concern: as post-secondary enrollment rises, so too will the strain on the economic, energy and ecological resources required to support them. As a result, we need to examine the sustainability initiatives undertaken by Alberta institutions; this will allow us to benchmark efficiencies in how we manage our educational costs and planet’s resources.

This research report attempts to address these areas of concern. In the following pages, we examine the sustainability initiatives of 10 universities, colleges and technical institutes in Alberta to gain a better understanding of campus trends across the province. Questions explore multiple dimensions of sustainability including: Policy and Administration, Campus design and Building Operations, Water Conservation, Public Transportation, and Waste, Recycling and Energy Management.

Although similar studies have been undertaken in other provinces, notably Ontario, ours is a first for Alberta. In undertaking this research project, we attempt to paint a more detailed picture of post-secondary institutions in Alberta and their views on environmental sustainability; provide recommendations for improvement on campus-led sustainability initiatives; and, lastly, identify opportunities for the Alberta Government and Campus Alberta to work together towards a more cost-effective, sustainable future.

To address these questions and meet these goals, a full-time researcher worked for ten weeks to create, deliver and analyze a survey of Alberta post-secondary institutions. The results of this survey are presented in this report, which is divided into five chapters. In the *Literature Review*, by examining a number of sources including a webinar, organizational websites, and research reports pertaining to the field of environmental sustainability, we are able to gain a more in-depth look into how crucial this area is to campus lifestyle, the greater community, and our way of life. We then outline our approach to the research in our *Methods* section. Here we look at how the selected institutions were chosen, the survey instrument and techniques we were using while outlining which campuses did and did not participate in our study. Results are then presented in the *Results* chapter where data from each of the eight dimensions of

sustainability are organized and plotted to summarize the overall trend. In the subsequent *Analysis* section, we try to explain our findings from a political, economical, social, and technological perspective. This is followed by a SWOT - strengths, weaknesses, opportunities and threats – analysis of campus sustainability practices. Finally, we wrap up our report with policy recommendations and opportunities for future research in our *Conclusions* section.

Chapter 1: Literature Review

We begin our research by scanning a number of sources that had either done comprehensive research, or have taken a leading role on environmental stewardship. This allows us to gain a better insight into what environmental sustainability is, what has been looked at, and what progress still needs to be made in this relatively young field for its successful integration with post-secondary institutions. In *Greening Campuses: Environmental Citizenship for Colleges and Universities* by Chernushenko (1996) and *Planet U: Sustaining the World, Reinventing the University* by M'Gonigle and Starke (2006), the authors argue that sustainability on campus have not been stressed enough to make the movement a global phenomenon for greening ideas to interchange and develop. In *Sustainability on Campus: Stories and Strategies for Change*, Barlett and Chase (2004) provides an interesting cross-examination on campuses across America and the sustainability initiatives that have succeeded and failed, and what we may learn from their experiences. We then sit in on the University of Rochester's online seminar to observe some of the greening projects that had been a growing success at their campus. Lastly, we investigate the Association for the Advancement of Sustainability in Higher Education (AASHE) (2011), a newly established organization that offers memberships to North American campuses and takes pride in encouraging environmental awareness.

I. Greening Campuses: Environmental Citizenship for Colleges and Universities **(1996)**

In *Greening Campuses: Environmental Citizenship for Colleges and University*, David Chernushenko (1996) examines global environmental citizenship, which is the notion where we as citizens of our community, country, and the world have rights to a healthy environment and the obligation to encourage and care for our environment. Chernushenko (1996) suggests that although environmental citizenship has been a cultural phenomenon in some parts of the world, many of the successes have been occurring locally, out of sight, or in isolation, leading to an area of concern. The literature contends these experiences require recognition and the need to be documented and, as a result, took on the initiative to draw experiences gained from countries such as Canada, which has been one of the pioneers of the environmental citizenship concept at the national level.

Believing higher education as the forefront in pioneering future generations to respect the environment, *Greening Campuses* worked together with the United Nations Environmental Programme (UNEP) and the Association of Community Colleges of Canada (ACCC) to study a number of Canadian campuses to examine their successes, flaws in policy making, and eco-friendly improvements over the years as a result of various management practices. As Chernushenko (1996) states, an effective environmental management system for any organization is one that is capable of defining the environmental and economic goals, policies and strategies of the organization, and implementing them (p. 1/1). Lastly, the literature offers a variety of solutions and opportunities for university and college decision makers to attain more

environmentally sound, influential and effective judgments in communication, greening offices and the curriculum, purchasing, policy making, communication, facility designs, transportation, and environmental studies programs while advancing to activities and projects that will seize the attention of the surrounding communities.

II. Sustainability on Campus: Stories and Strategies for Change (2004)

Sustainability on Campus: Stories and Strategies for Change (2004) explores the personal narratives of eighteen different colleges and universities from across the United States to preserve the valuable accounts and crucial information on the unfolding of a national movement toward campus sustainability. Although the book states that the stories come from a diverse group of individuals ranging from faculty and administrative staff to students from two to four year public, private, undergraduate, doctoral granting, research focused institutions, there are common themes and areas of focus that emerge: environmental stewardship on campus, attention to green building designs, focus on a greener curriculum, engaging students in community beyond campus boundaries and system-wide initiatives.

The authors of *Sustainability on Campus* understand sustainability to be the intersection of three domains that include economic, environmental, and the social realm. Meanwhile, this book focuses on collecting stories to provide options, ideas, strategies and perspectives for those interested specifically in pursuing the unfolding of environmental awareness and culture change and to those who strive to change higher education to become more sustainable.

III. Planet U: Sustaining the World, Reinventing the University (2006)

During the publication of *Planet U: Sustaining the World, Reinventing the University* (2006), the Kyoto Accord in Montreal had just completed two weeks of negotiations involving 150 countries to successfully keep the treaty alive. M’Gonigle & Starke (2006), the authors of this book, however suggests that the “very problems that Kyoto and Montreal were intended to counter were daily [already] being created at our own institution, at a university” (p. xiv).

Written by the members of the University of Victoria’s (UVic) Campus Development Committee and the student-based UVic Sustainability Project, the authors argue that the university holds a missing key to global sustainability, and believe educating young minds as the root to empower a more sustainable future has been a major area of negligence. M’Gonigle & Starke examine the university system as an institution’s 900 year history, the role it has taken in our society and the powerful mindsets that originate from such institutions that set the agenda for our modern world. *Planet U* critiques the gap that exists between what we learned for tomorrow and what tomorrow requires from us today. A sustainable university is not simply about more efficient light bulbs and fewer parking lots, but about a campus sustainability movement that encourages and educates individuals and future generations to practice and preach a more sustainable lifestyle. Altogether, *Planet U* reveals the truly revolutionary potential of this campus sustainability movement. It explores areas universities can better their practice including transportation, urban development and land use which at a broader picture, pioneers our future teachers, world leaders, engineers, and generations to a more sustainable choice of lifestyle.

IV. A Multi-Year Plan for Changing the Culture of Sustainability on Campus

University of Rochester Association of College Unions International [ACUI]

Webinar (February 1, 2011)

Presented in the form of an ACUI Webinar, Stacey Fisher, assistant director of the Wilson Commons Student Activities of University of Rochester (UR) provides the audience with an insightful look into their school's sustainability planning and objectives that have been a success in the making for their school community. The one hour Webinar examines culture change created by specific student-led campaigns: students promoting a clothing exchange, where they re-use personal unwanted items students do not utilize anymore, and a student council for group leaders and students to voice their opinions. Furthermore, Fisher explores areas of sustainability that reward students with free training, course credits and recognition for undertaking environmentally friendly projects on campus. Moreover, programs that have already become a growing success at their campus are discussed. These include the participation in the College Sustainability Report card to provide a progress report on their improvements; UR Unplugged which has helped the campus reduce overall 2010 energy consumption by 7% through friendly dorm competitions; working with Aramark to include composting, tray-less meals, sustainable purchasing practices; and having a Facebook page to promote student recycling. Lastly, the Webinar provides twelve unique points to other campuses on how to make their environmental sustainable goals a growing success.

V. Association for the Advancement of Sustainability in Higher Education

[AASHE] website (2011)

The Association for the Advancement of Sustainability in Higher Education (AASHE) was established in 2006 with a mission to integrate and prioritize environmental sustainability with campus governance, education, and research. Reviewing the organization's website, AASHE (2011) envisions a prosperous, healthy, ecological world equal to all people. AASHE believes in higher education playing an essential role in helping people understand the connections between economic, environmental, and social forces to meet sustainability challenges. To enforce their vision, they have long-term and collaborative partnerships with a number of organizations to encourage environmental awareness. As well, to inform, recognize, and encourage participation between institutions, AASHE has included three newsletters published throughout the year, awards offered annually at the AASHE conference, professional development programs, and publications on special reports, how-to guides, AASHE Digests, and a Climate Action Planning wiki. According to their website, AASHE acts as a resource center to campus sustainability and offers higher education institutions with a way to recognize and measure their sustainability progress by developing a standardized instrument called the Sustainability Tracking, Assessment & Rating System (STARS). Membership may be obtained from their website and is offered to the United States, Canada and Mexico with fees being administered based on FTE student enrollment and whether an institution offers a 2 or 4-year program.

Chapter 2: Methodology

Seventeen institutions from Alberta were chosen as part of our study. Twelve of the seventeen campuses were chosen on the criteria of being a member of the Alberta Students' Executive Council (ASEC), an organization that unites over 120,000 students across Alberta to voice their opinions and develop long term solutions to student issues. NorQuest College was chosen as it will become an ASEC member in the following year, while the other four institutions – University of Alberta, University of Calgary, Athabasca University and University of Lethbridge were selected on the merit of being Alberta's four comprehensive academic and research institutions. In the end, ten post-secondary institutions decided to take part in our study.

The survey was laid out using a program called Survey Monkey where participants had to click on a link provided by an email invitation to a website that would store all of their responses. The 38 survey questions were primarily inspired by a similar study completed by the Council of Ontario Universities (2009) called *Ontario Universities: Going Greener* while other questions were based on knowledge gleaned from the materials outlined in the *Literature Review* chapter (please see Appendix A for copy of our survey). The response format included open ended, multiple choice, select all that apply, and yes/no. The questions that explore a range of categories relating to on-campus environmental sustainability including policy and administration, waste and recycling, energy management, campus design, building operation, water conservation and public transportation.

To find the appropriate staff member of each institution to conduct our survey, a number of phone calls and emails were made to various departments at each campus including the student association, general inquiries, external relations, sustainability office, facilities and

services, environmental sciences, maintenance, and environmental health & safety. From the collected contact information, our survey invitation emails were originally sent out with an expected deadline of February 9, 2011. Because a few of our emails were re-directed around to a number of unknown staff members within the campuses while other institutions did not respond, more phone calls and emails were made to either follow up on the progress of the surveys, and/or to other staff members who would be knowledgeable enough to conduct the questionnaire. Adjustments to contact information and deadline extensions were made to fit the interested participants' demanding schedule. Because we soon found that not every institution had the time, resources, right staff members, or even a sustainability officer on hand to fully answer our questions, we had to make adjustments to allow participants to answer what they could answer while leaving what they were not familiar with blank to ease and increase participation rate.

The responses were then compiled and plotted using both Survey Monkey and into various graphs and extrapolated for analysis. Lastly, an email was sent thanking all participants for conducting our study while our ASEC contact information was provided in the case anyone were interested in our findings.

I. List of participating Alberta institutions

- Alberta College of Art + Design (ACAD)
- Athabasca University
- Grande Prairie Regional College
- Grant MacEwan University
- Lethbridge College
- Medicine Hat College
- Mount Royal University
- NAIT
- Olds College
- Red Deer College
- SAIT

II. List of Alberta institutions that did not participate

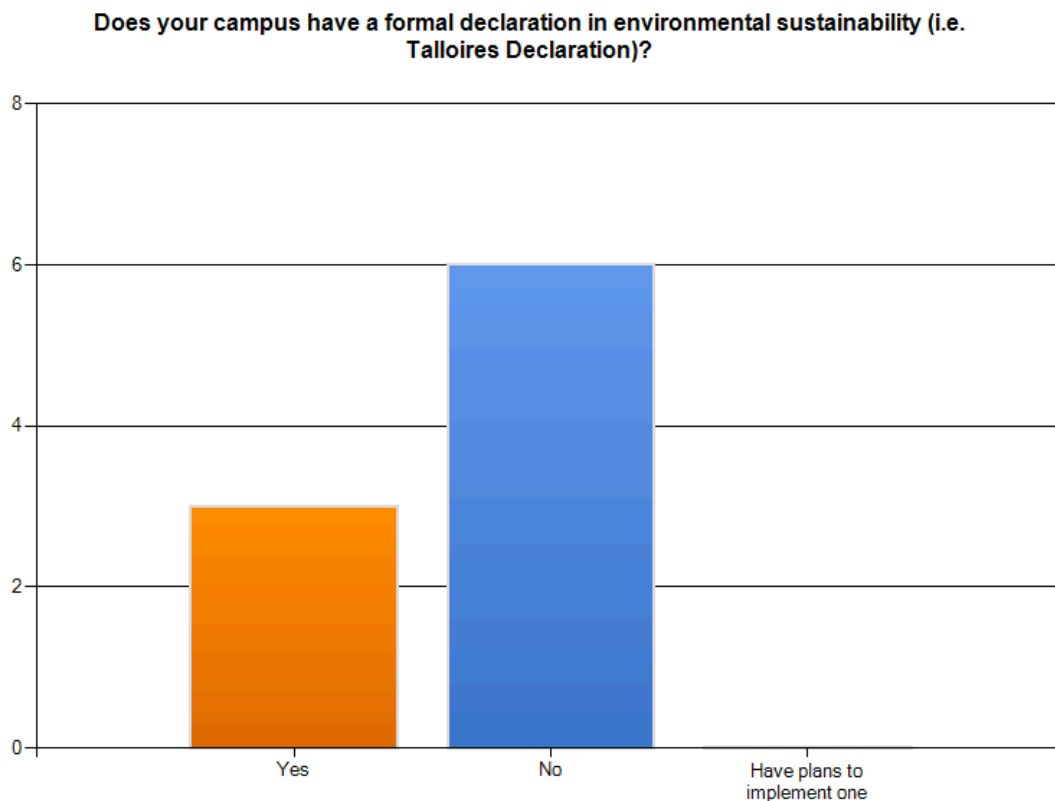
Institution	Reason
Bow Valley College	Agreed to participate but did not complete out survey. Did not return our call/email.
Grande Prairie Regional College	Did not respond regardless of numerous attempts.
Keyano College	Agreed to participate however, only completed contact information of survey. Did not return our call/email.
Norquest College	Facilities Director declined participation, as former staff member in charge is no longer with them.
University of Alberta	Sustainability Officer declined because their institution is too administratively complex to provide timely answers.
University of Calgary	Sustainability Coordinator Intern declined, as his supervisor believed survey was too challenging to manage.
University of Lethbridge	Research Officer declined due to his lack of resources which he believed would provide an inaccurate picture of sustainability at U of L

Chapter 3: Results

Our results are categorized into six primary sections: Policy and Administration, Waste and Recycling, Energy Management, Campus Design and Building Operation, Water Conservation, and Public Transportation. Each of the 38 questions was plotted using horizontal, vertical, or pie graphs, depending on which method we believed had been easier for viewing and comparison of its pattern and characteristics. Lastly, our results in percentages are rounded to the nearest whole number.

I. Policy and Administration

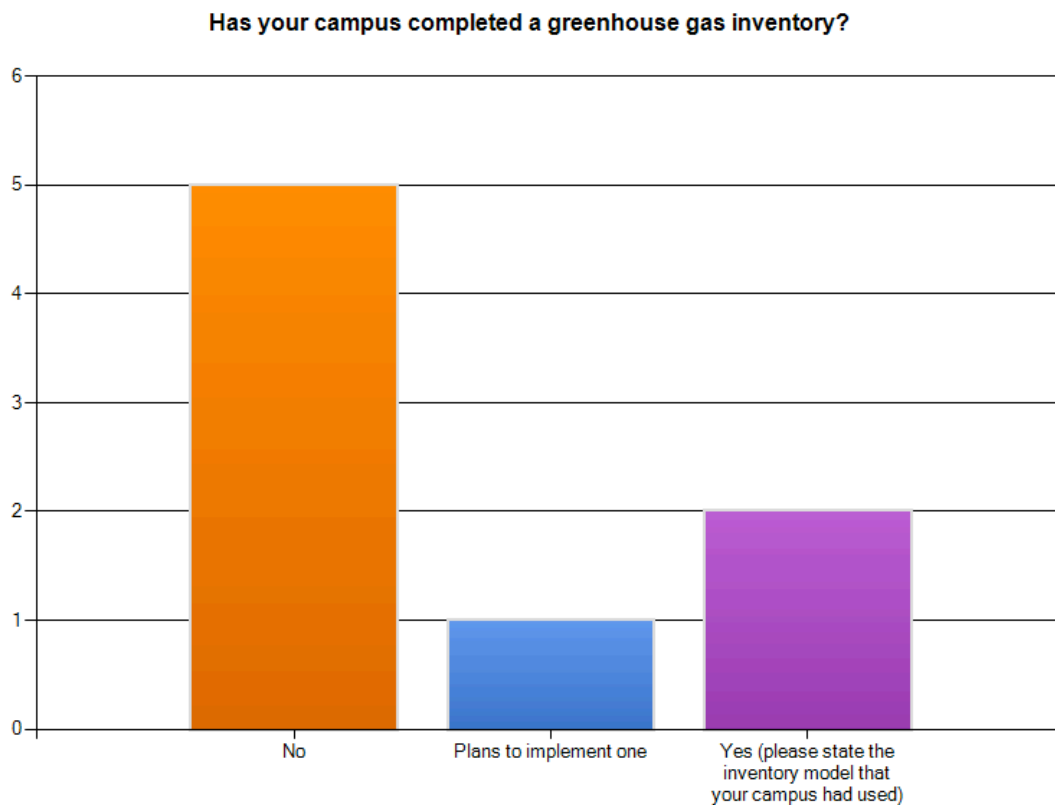
QUESTION 1:



- 3 of 9 (33%) participating campuses said they **have** signed on to a formal declaration.

- 6 of the 9 campuses (67%) that responded **have not** signed to a formal declaration in environmental sustainability while none have plans to implement one in the near future.
- 1 institution did not respond to this question

QUESTION 2:



- 2 of the 8 institutions, or 25% that responded have said yes to completing a greenhouse gas inventory.
- 5 of the 8 institutions, or 63% that responded **have not** completed a greenhouse gas inventory while 1 (13%) campus has plans to develop one.
- 2 institutions did not respond to this question

Inventory model and areas inventoried for institutions that had answered yes to question #2

(question 3):

Grant MacEwan University:

- Model: GHG protocol <http://www.ghgprotocol.org/>
- Inventoried areas: Purchased electricity, steam, heat, or cooling energy

Athabasca University:

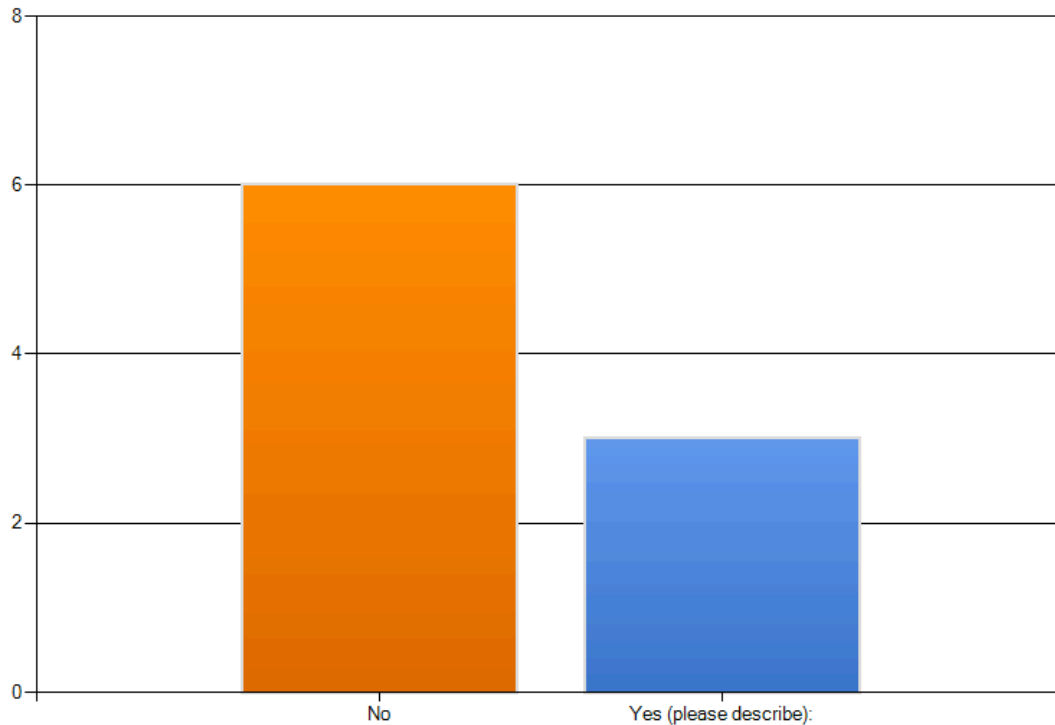
- Model: Carbon Calculator
- Inventoried areas: Natural gas combustion, transportation, commuting and waste disposal

Institutions that plan to implement a greenhouse gas inventory include:

- Olds College

QUESTION #4

Does your campus have any partnerships with businesses, organizations, and/or government programs to encourage environmental sustainability?



- 3 of the 9 institutions, or 34% that responded to this question have partnerships with business, organizations, and/or government programs encouraging sustainability.
- 6 of the 9 institutions, or 67% that responded **have not** had any partnerships with business, organizations, and/or government programs encouraging sustainability.
- 1 institution did not respond to this question

Campuses that responded yes have said to be partnered with:

Red Deer College:

- Rethink Red Deer

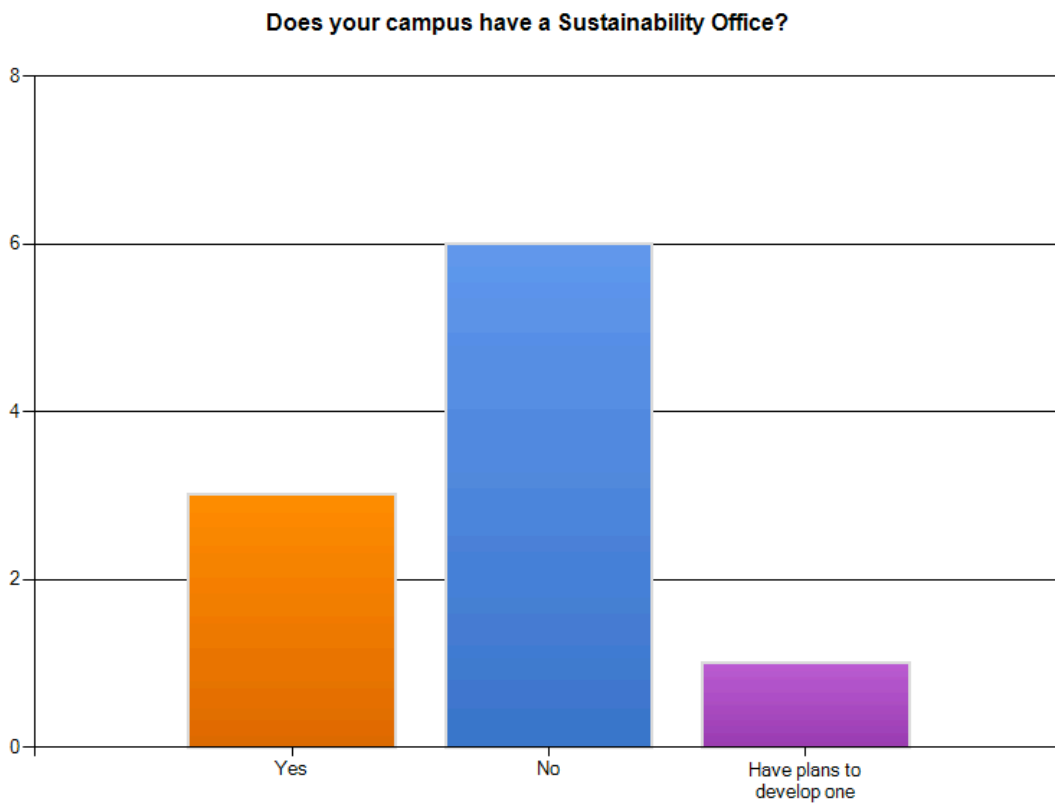
SAIT:

- Currently contracted PCL to build a \$450 million dollar Trades and Technology Complex keeping with PCL’s environmental goals.

Mount Royal University:

- At the sustainability centre, we run workshops and bring in sustainable businesses/groups to lead them.

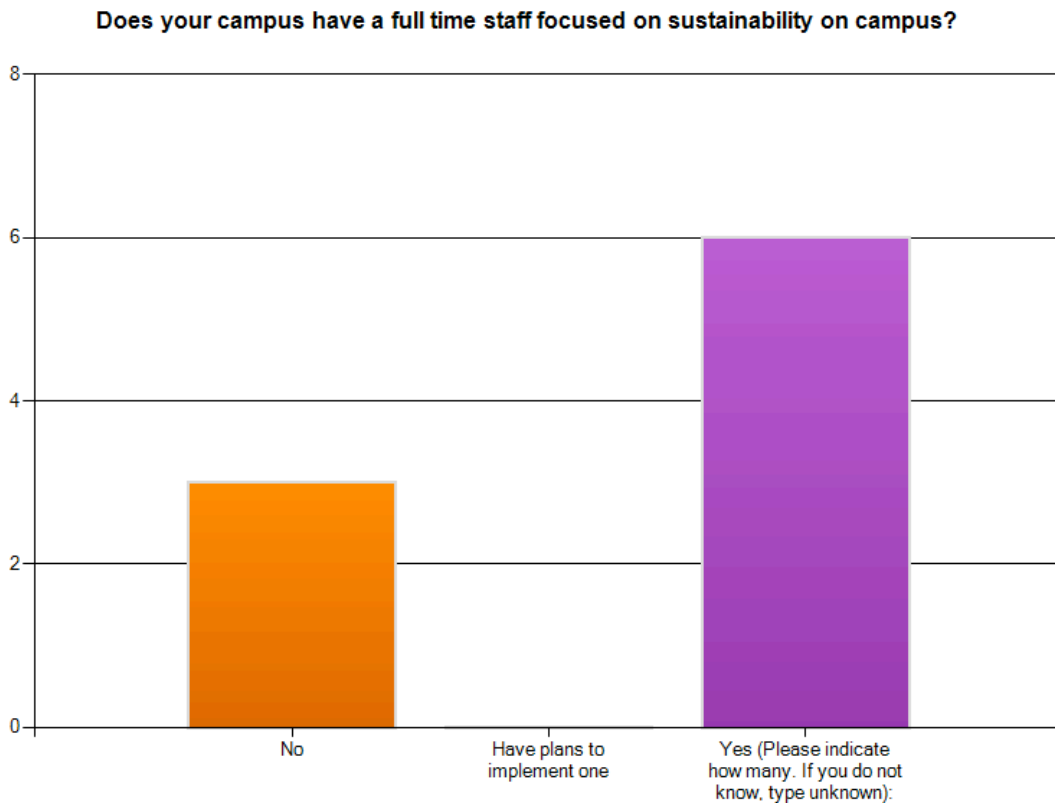
QUESTION #5:



- 3 of the 10, or 30% of campuses have sustainability offices with one (10%) planning to develop an office soon.
- 6 of the 10, or 60% of campuses **do not** have a sustainability office

- Note: The University of Alberta and the University of Calgary also have Sustainability offices. The University of Lethbridge has an Environmental Science department, however these three institutions did not participate in the survey.

QUESTION #6:

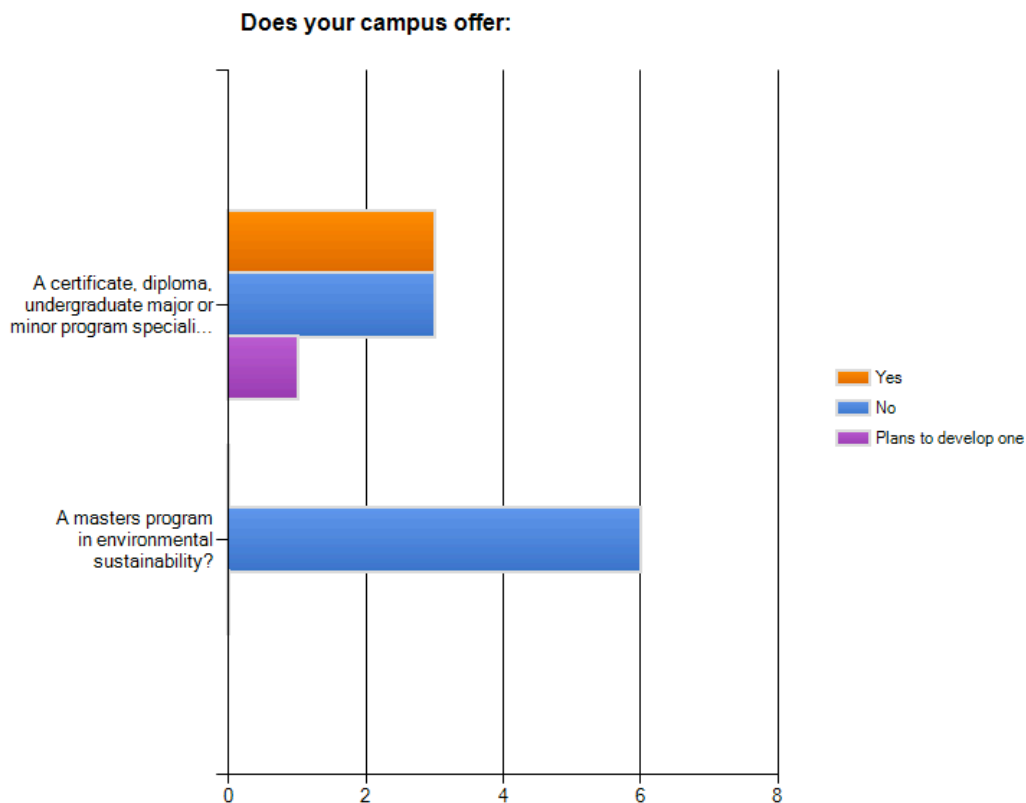


- 6 of the 9 campuses, or 67% of those that responded have said they have a full time sustainability staff available.
- 3 of the 9 campuses, or 34% of those that responded have said they **do not** have a full time sustainability staff available.
- 1 institution did not respond to this question

QUESTION #7:

Does your campus offer:

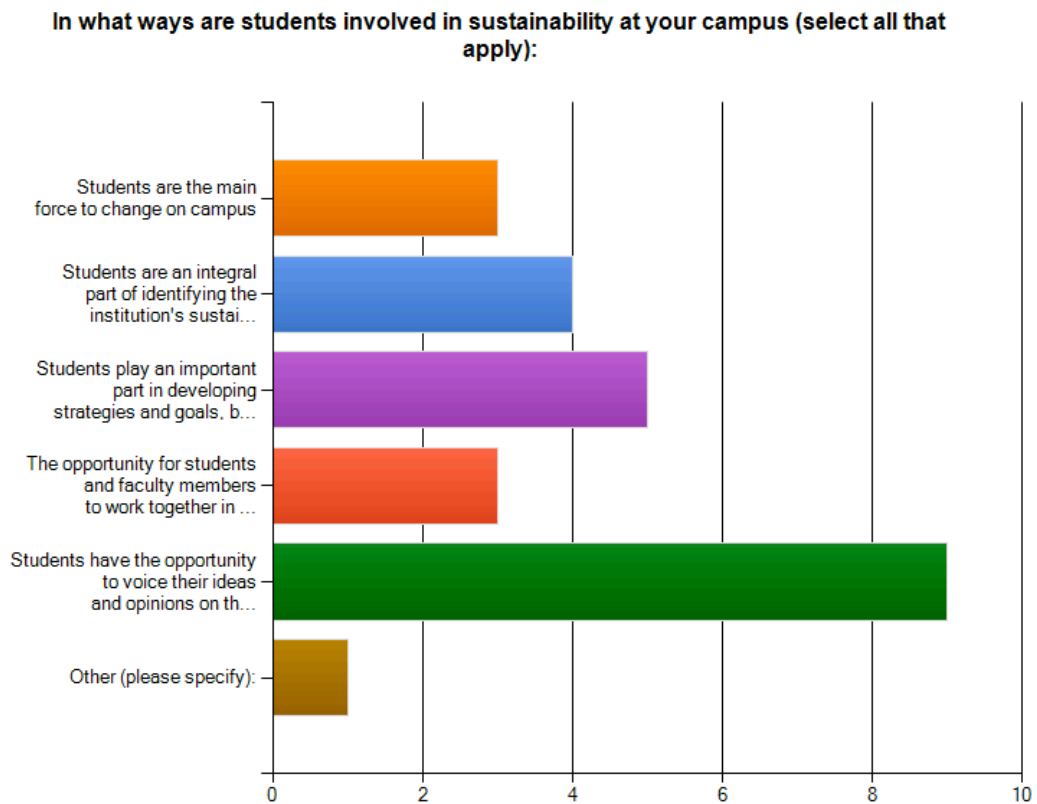
- A certificate, diploma, undergraduate major or minor program specializing in environmental studies?
- A masters program in environmental sustainability?



- 43% (3 of the 7 campuses) of those that responded have said they offer a certificate, diploma, undergraduate major or minor program specializing in environmental studies
- 3 (43%) campuses said they do not
- 1 (14%) campus said they have plans to develop one.
 - 3 campuses did not respond to this question

- All 6 respondents said they **do not** offer a masters program in environmental sustainability
 - 4 campuses did not respond to this question
 - It is valuable to note all 4 campuses that did not respond were colleges, or colleges that just made the transition to university status, thus, this question would not apply to them.

QUESTION #8:



Of the participants that responded:

- 33% (3) said students are the main force of change on campus

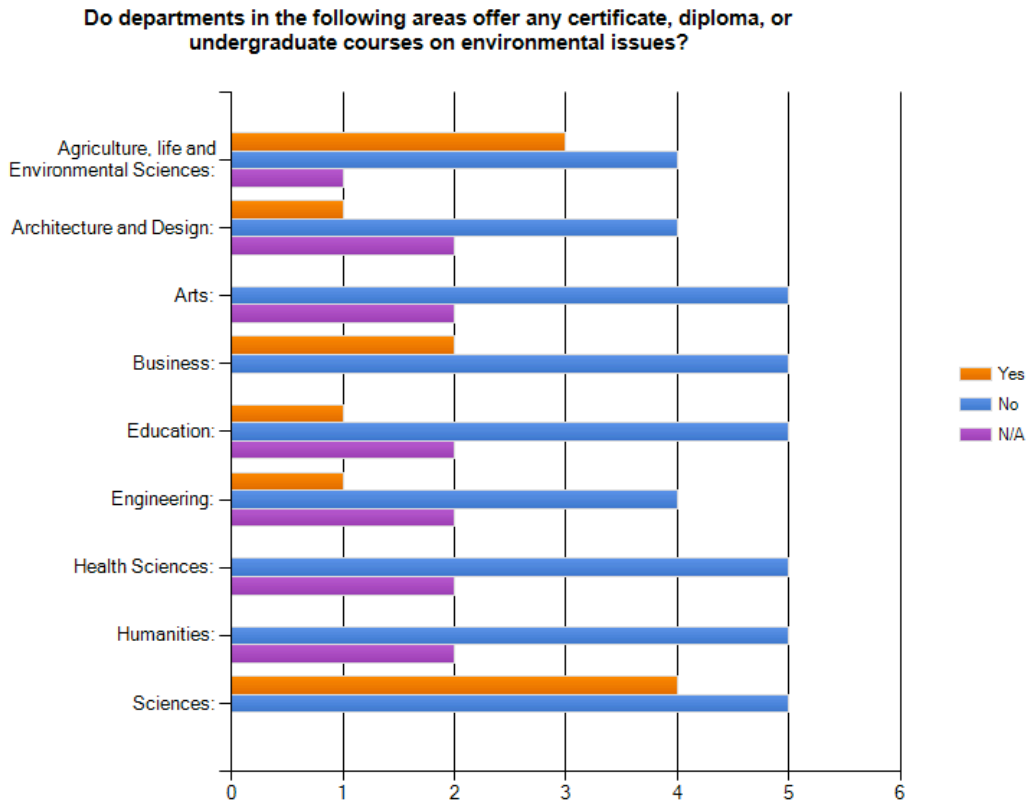
- 44% (4) said students are an integral part of identifying the institution's sustainability goals and practices
- 56% (5) said students play an important part in developing strategies and goals, but do not play a key role in the decision making process
- 33% (3) said the opportunity for students and faculty members to work together in generating sustainable ideas on campus inspired by specially designed educational and/or research programs is important
- 100% of campuses (10) said students have the opportunity to voice their ideas and opinions on the institution's sustainability through social clubs, gatherings, and extracurricular activities.

The following institution(s) have also suggested that:

Red Deer College:

- Students are encouraged to join the Green Campus Task Group

QUESTION #9:



Of the participants that responded to whether or not they have courses relating to environmental issues in the offered certificate, diploma or undergraduate programs:

- 38% (3) said yes, 50% (4) said no, and 13% (1) to N/A to having courses dealing with environmental issues in Agriculture, Life and Environmental sciences.
- 14% (1) said yes, 57% (4) said no, and 29% (2) said N/A to having courses dealing with environmental issues in Architecture and Design.
- 0.0% (0) said yes, 7% (5) said no, and 29% (2) said N/A to having courses dealing with environmental issues in Arts.
- 29% (2) said yes, 71% (5) said no, and 0% (0) said N/A to having courses dealing with environmental issues in Business.

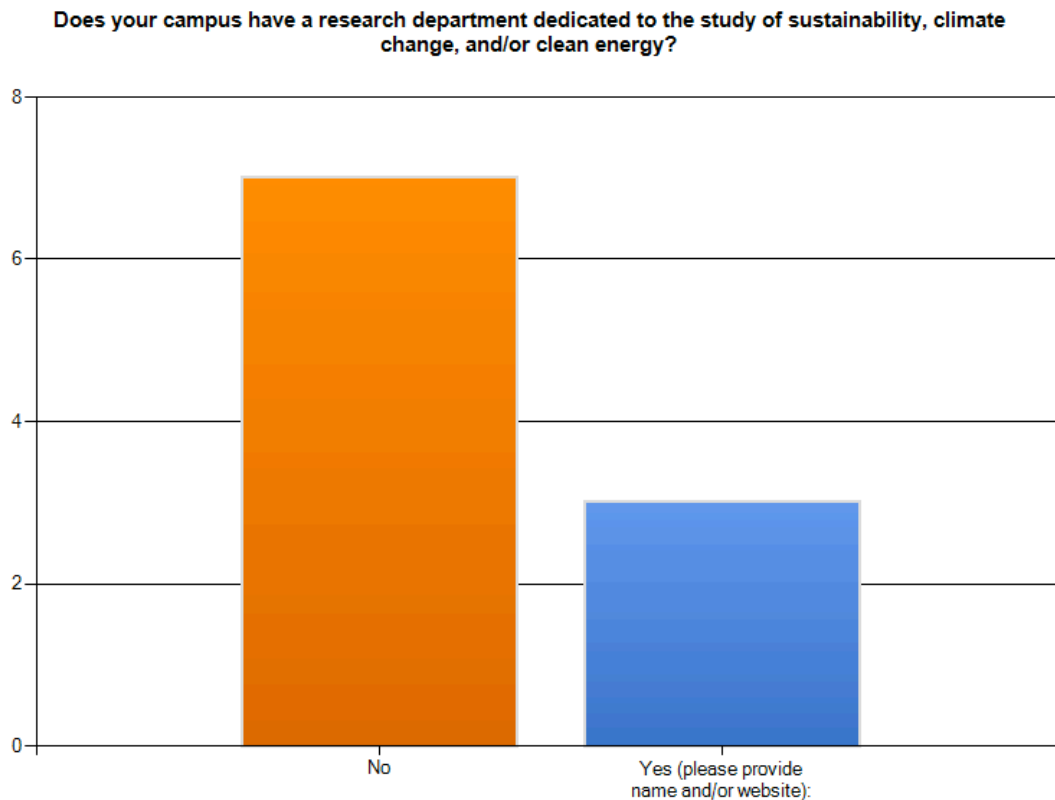
- 13% (1) said yes, 63% (5) said no, and 25% (2) said N/A to having courses dealing with environmental issues in Education.
- 14% (1) said yes, 57% (4) said no, and 29% (2) said N/A to having courses dealing with environmental issues in Engineering.
- 0% (0) said yes, 71% (5) said no, and 29% (2) said N/A to having courses dealing with environmental issues in Health Sciences.
- 0% (0) said yes, 71% (5) said no, and 29% (2) said N/A to having courses dealing with environmental issues in Humanities.
- 44% (4) said yes, 56% (5) said no, and 0% (0) said N/A to having courses dealing with environmental issues in Sciences.

The following institution(s) have also suggested that:

Red Deer College:

- They don't offer any programs specifically for environmental issues, however many of the programs offer one or two classes that focus on environmental issues.

QUESTION #10:



- 70% (7) of participants that responded said they **do not** have a research department dedicated to the study of sustainability, climate change, and/or clean energy while 30% (3) said that they do.

Institutions that responded yes to having a research department dedicated to the study of sustainability, climate change, and/or clean energy also provided the name:

Olds College:

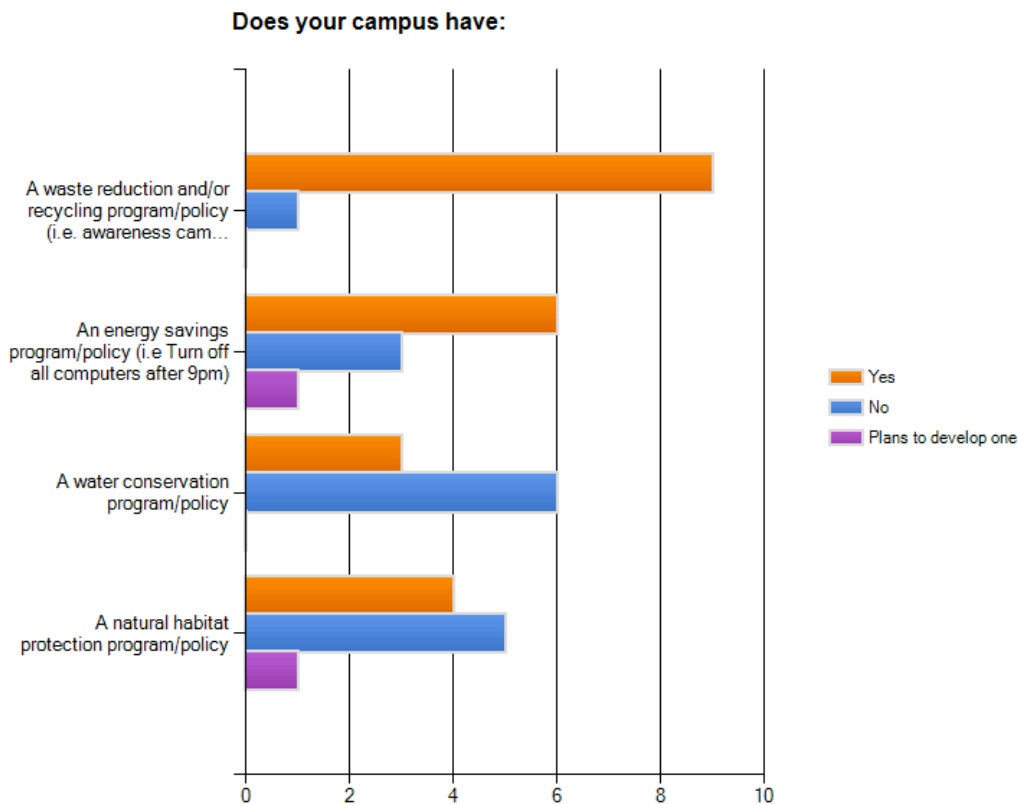
- Olds College School of Innovation

SAIT:

- Indicates Applied Research and Innovation Studies may be involved in such research.

Waste and Recycling

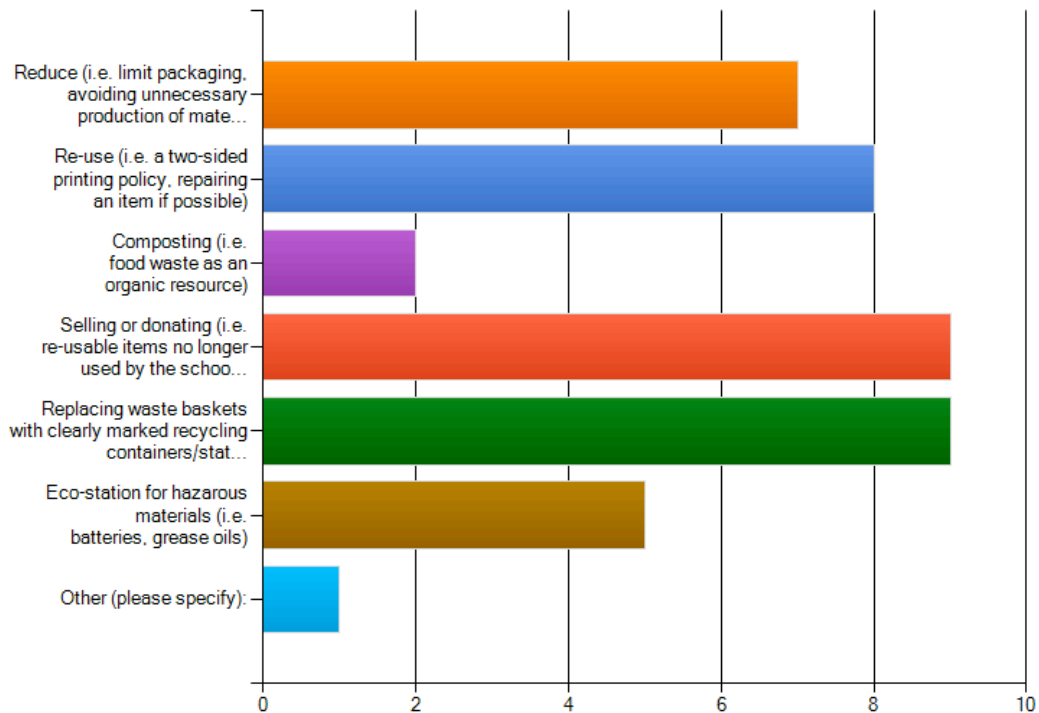
QUESTION #1:



- 90% (9) said yes, 10% (1) said no, and 0% (0) has plans to develop a waste reduction and/or recycling program/policy (i.e. awareness campaigns aimed at waste reduction).
- 60% (6) said yes, 30% (3) said no, and 10% (1) have plans to develop an energy savings program/policy (i.e. Turn off all computers after 9pm).
- 33% (3) said yes, 66% (6) said no, and 0% (0) have plans to develop a water conservation program/policy
- 40% (4) said yes, 50% (5) said no, and 10% (1) have plans to develop a natural habitat protection program/policy.

QUESTION #2:

Which of the following techniques have been used as a way to reduce solid waste at your campus? (select all that apply)

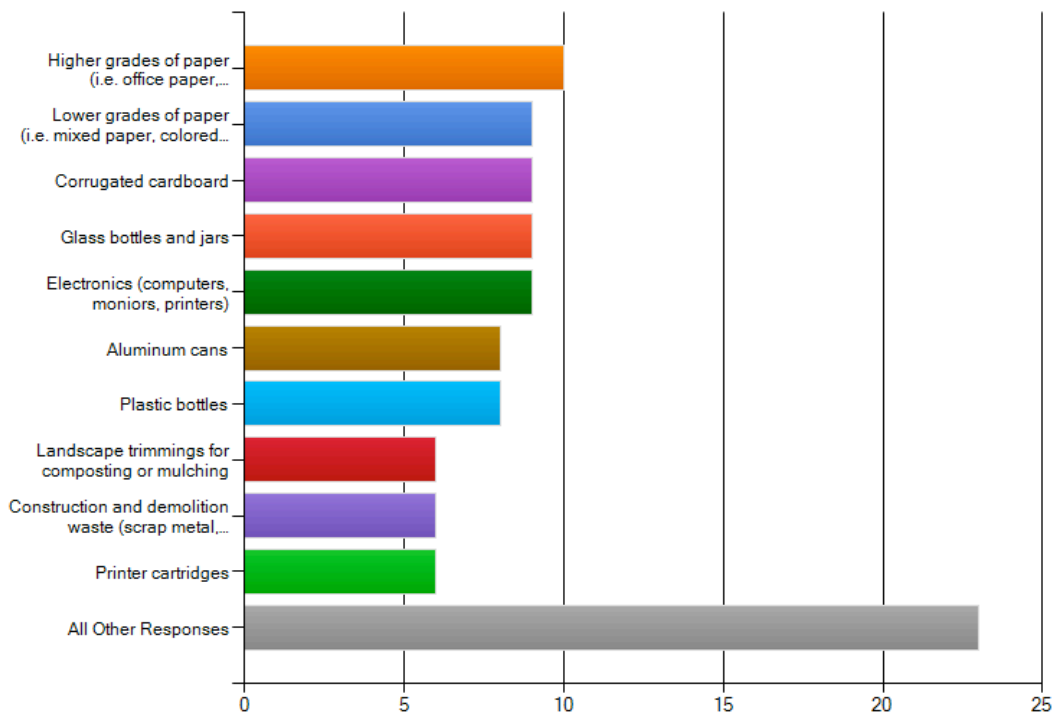


- 70% (7 of 10) of respondents uses the reduce technique as a way to reduce solid wastes on campus
- 80% (8 of 10) of respondents uses the re-uses technique as a way to reduce solid wastes on campus
- 20% (2 of 10) of respondents uses composting as a way to reduce solid wastes on campus
- 90% (9 of 10) of respondents sells or donates re-usable items as a way to reduce solid wastes on campus

- 90% (9 of 10) of respondents replace waste baskets with clearly marked recycling containers/stations as a method of reducing solid wastes on campus
- 50% (5 of 10) of respondents have eco-station for hazardous materials (i.e. batteries, grease oils)
- 10% (1 of 10) of respondents have suggested in the 'other' comment box that they utilize paper and cardboard recycling as a method of reducing solid wastes on campus

QUESTION#3:

Please indicate which item(s) your campus collects for recycling or appropriate disposal (select all that apply):

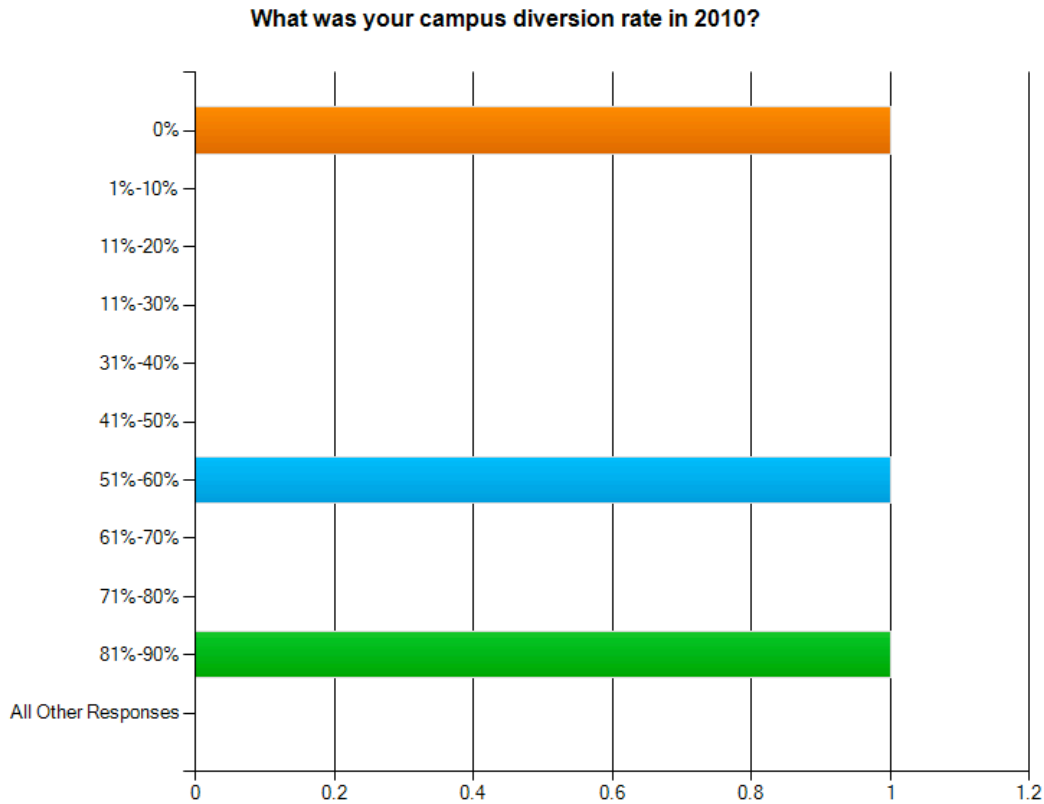


Of the 10 campuses that responded said they collect the following for recycling or for appropriate disposal:

- 0% (0) said they collect polystyrene and hand towels from washrooms
- 10% (1) said they collect non-construction scrap wood

- 10% (1) indicated in the 'other' comment box that although they (Mount Royal University) are unsure about the oils, polystyrene was banned at SAMRU (Students Association at Mount Royal University).
- 20% (2) said they collect fluorescent tubes, CFLs, coffee cups and food scraps
- 30% (3) said they collect non-construction metal
- 40% (4) said they collect batteries, grease, frying oils, and motor oils
- 60% (6) said they collect printer cartridges, landscape trimmings for composting or mulching, and construction/demolition waste (scrap metal, wood, concrete, bricks or stone)
- 80% (8) said they collect aluminum cans and plastic bottles
- 90% (9) said they collect corrugated cardboard, glass bottles, jars, electronics (computers, monitors, printers), and lower grades of paper (i.e. mixed paper, colored paper, junk mail, newspaper, box board, magazines, craft paper)
- 100% (10) said they collect higher grades of paper (i.e. office paper, computer printout)

QUESTION#4:



7 of the 10 participants did not respond to this question. Of the 3 that did respond:

- 1 campus have indicated their 2010 campus diversion rate to be 0%
- 1 campus have indicated their 2010 campus diversion rate to be 51%-60%
- 1 campus have indicated their 2010 campus diversion rate to be 81%-90%

QUESTION #5:

Please list or describe any other green initiatives your campus offers in the area of recycling and waste management that had not been previously mentioned (optional).

Lethbridge College:

- Have indicated they recycle textbooks/books and computer bags
-

Red Deer College:

- Have indicated that although they do not have calculations of diversion, they do have many recycling bins around the college

Grant MacEwan University:

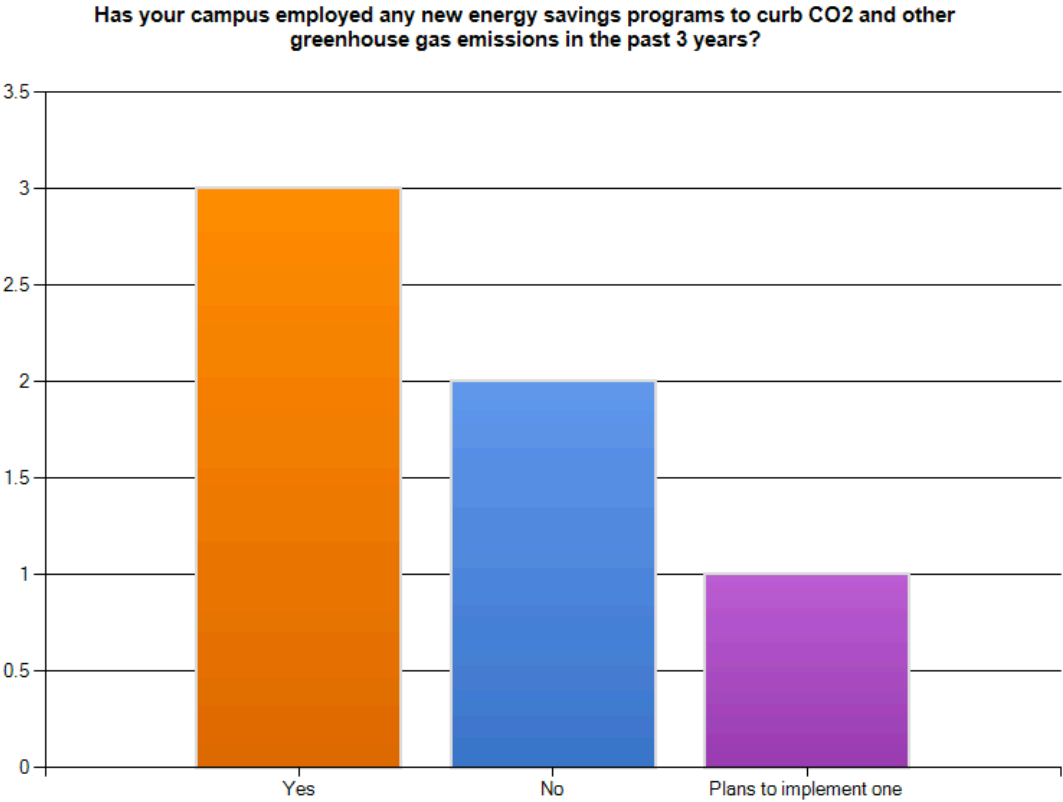
- Have indicated that they have a CAPS OFF Program. Not only does this program encourage the collection and recycling of plastic caps, the proceeds raised are given to support Rainbow Society of Alberta to Alberta children with chronic or life threatening illnesses

Mount Royal University:

- Have indicated they recycle cell phones
- They have began an eco store on campus

III. Energy Management

QUESTION #1:



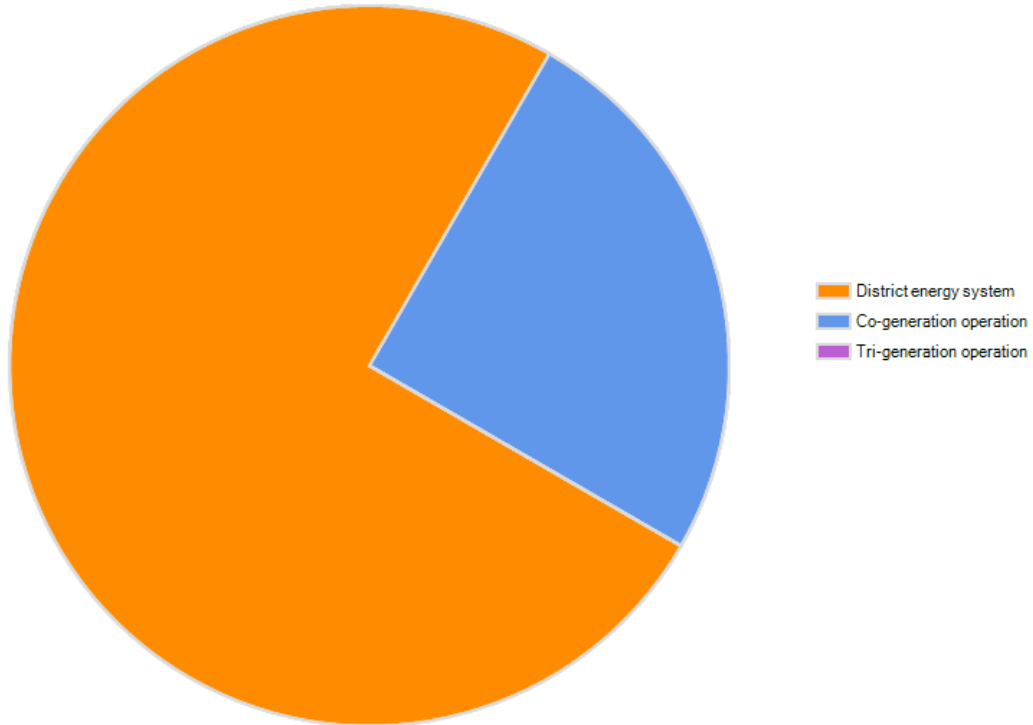
Out of the 6 campuses that responded to whether or not they had employed new energy savings programs to curb CO2 and other greenhouse gas emissions in the past 3 years:

- 50% (3) of campuses said yes
- 33% (2) of campuses said no
- 17% (1) have indicated they plan to develop a savings program

4 institutions did not respond to this question

QUESTION #2:

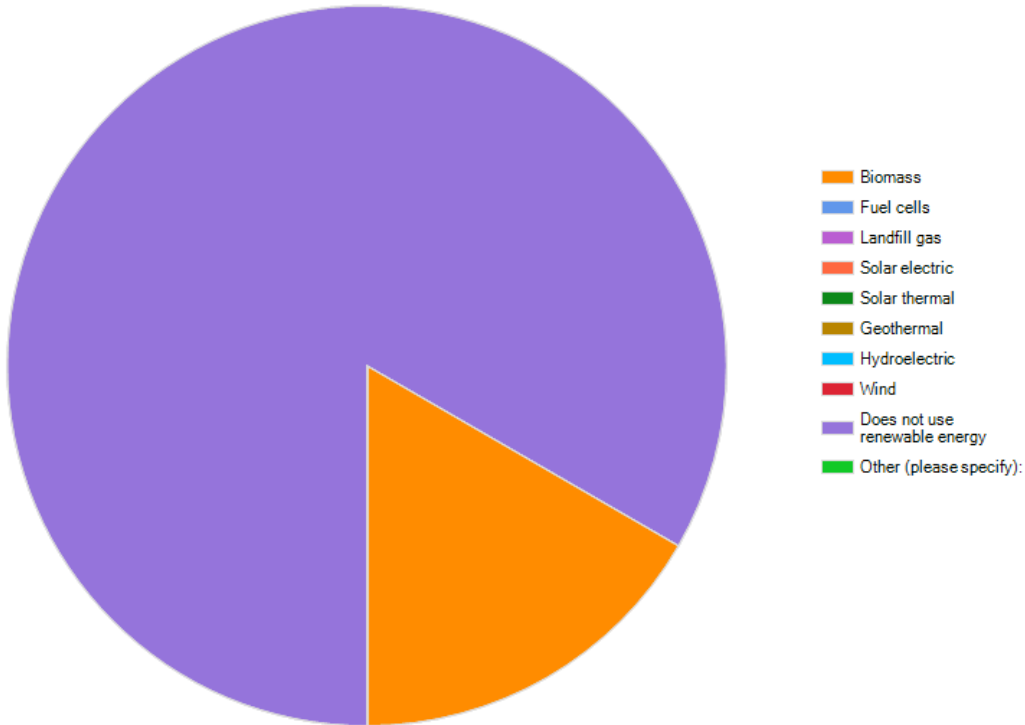
**Which of the following installations does your campus have?
Please select all that apply:**



- 75% (3 out of the 4) of respondents have suggested they use a district energy system
 - 25% (1 out of the 4) of campuses have suggested they use co-generation operation
 - 0% (0) campuses said they use Tri-generation operation
 - 6 institutions did not respond to this question
-

QUESTION #3:

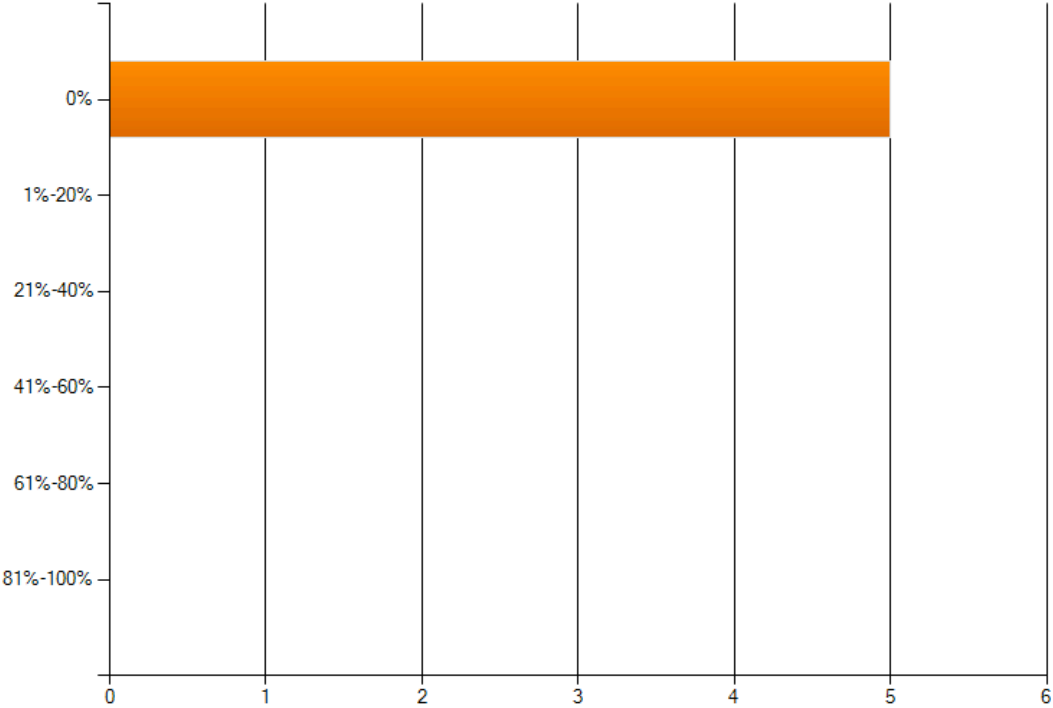
Which of the following renewable energy resources does your campus utilize? Select all that apply:



- 17%, or 1 of the 6 institutions that responded said they utilize biomass as a renewable energy resource.
- 83% (5 of 6) institutions that responded said they do not use any renewable energy resources
- 4 institutions did not respond to this question

QUESTION #4:

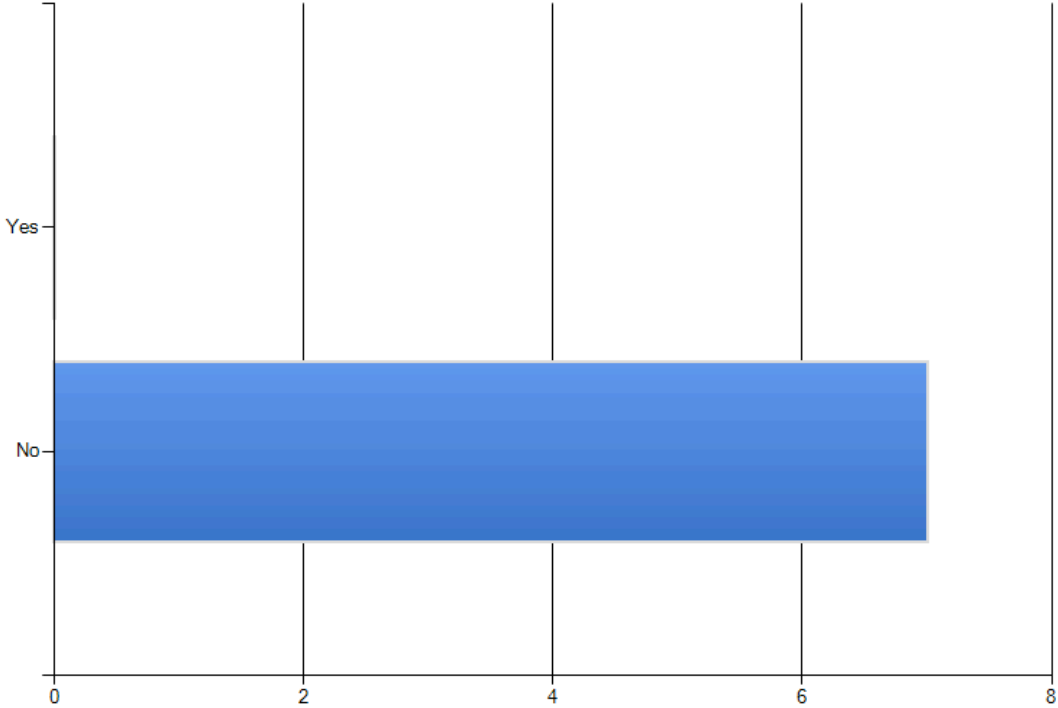
Approximately what percentage of your energy comes from on-campus generated renewable resources?



- None of the 5 campuses that responded use on-campus generated renewable resources
- 5 institutions did not respond to this question

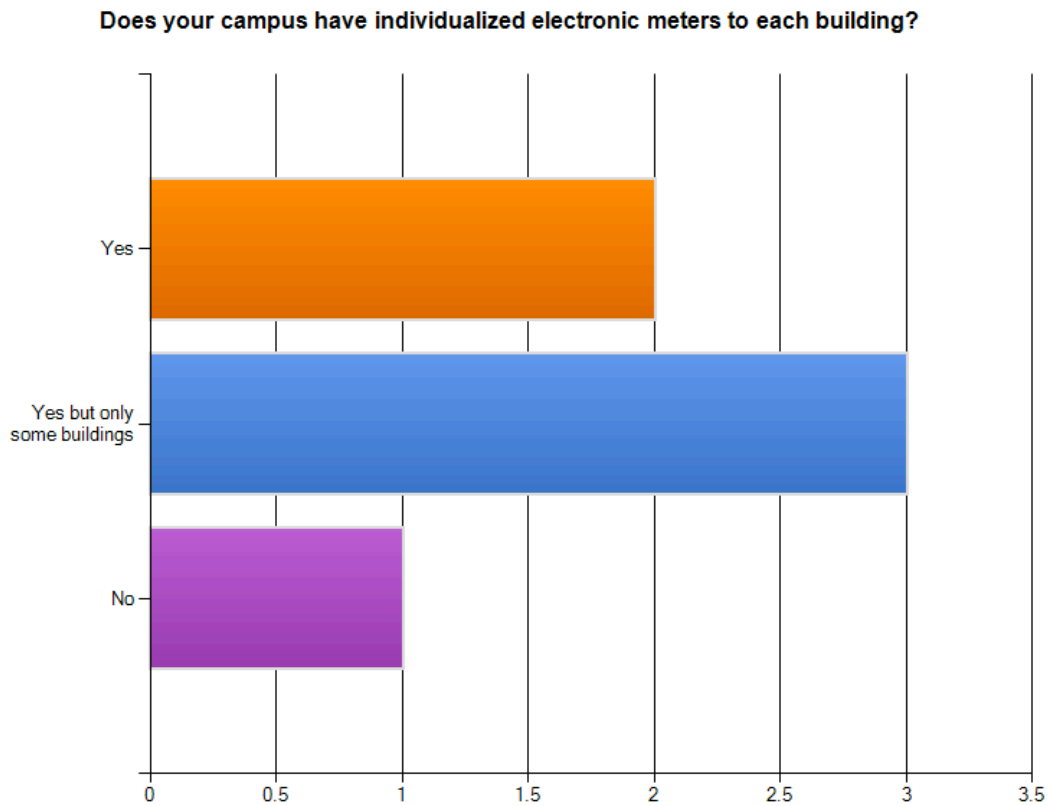
QUESTION #5:

Does your campus purchase energy from an off-campus renewable source? (i.e. Bullfrog Power)



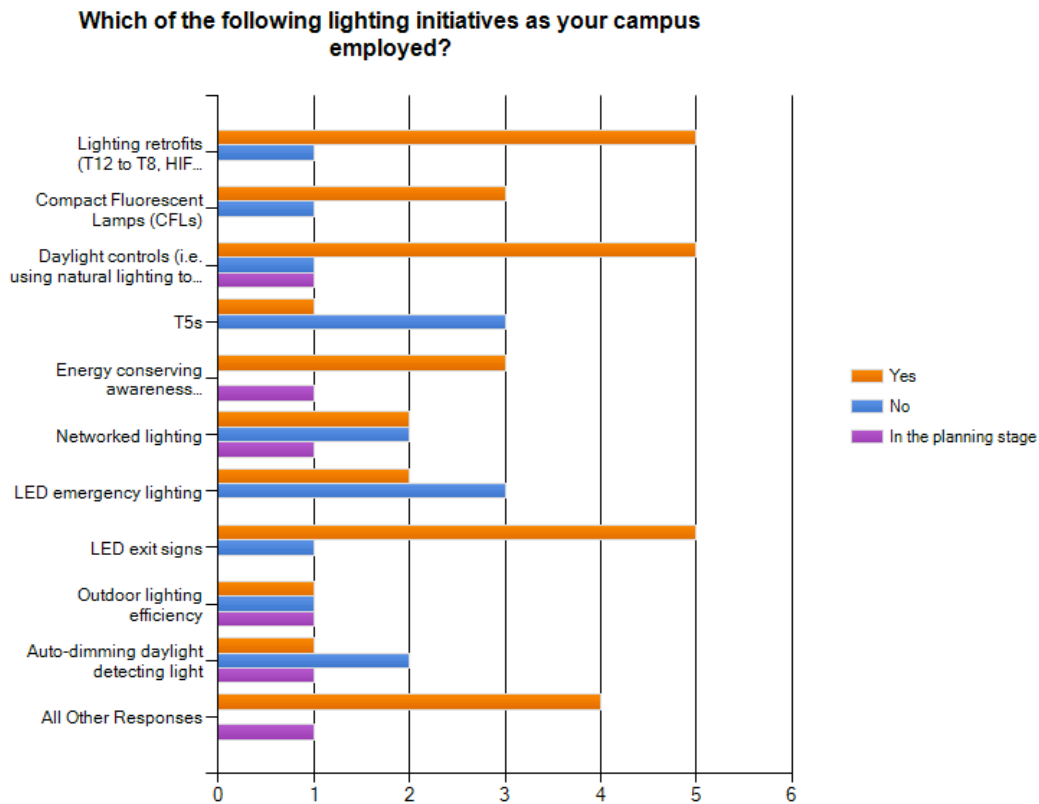
- Of the 7 campuses that responded, none purchase energy from an off-campus renewable source (i.e. Bullfrog Power)
- 3 institutions did not respond to this question

QUESTION #6:



- 33% (2) of the 6 campuses who responded said they do have individualized electronic meters to each building
- 50% (3) of the 6 campuses who responded said they have individualized electronic meters in some buildings
- 17% (1) of the 6 campuses who responded said they do **not** have individualized electronic meters in each building
- 4 institutions did not respond to this question

QUESTION #7:



- 83% (5) said have yes, 17% (1) have said no, and 0% (0) have said in the planning stage for lighting retrofit initiatives (T12 to T8, HIF or HID fixtures)
- 75% (3) have said yes, 25% (1) have said no, and 0% (0) have said in the planning stage for utilization of compact fluorescent lamps (CFLs)
- 71% (5) have said yes, 14% (1) have said no, and 14% (1) have said in the planning stage for utilization of daylight controls (i.e. using natural lighting to supplement electric lighting, skylights, etc)
- 25% (1) have said yes, 75% (3) have said no, and 0% (0) have said in the planning stage for utilization of T5s

- 75% (3) have said yes, 0% (0) have said no, and 25% (1) have said in the planning stage for energy conservation awareness ads/bulletins/campaigns
- 40% (2) have said yes, 40% (2) have said no, and 20% (1) have said in the planning stage for utilization of networked lighting
- 40% (2) have said yes, 60% (3) have said no, and 0% (0) have said in the planning stage for utilization of LED emergency lighting
- 83% (5) have said yes, 17% (1) have said no, and 0% (0) have said in the planning stage for utilization of LED exit signs
- 33% (1) have said yes, 33% (1) have said no, and 33% (1) have said in the planning stage for utilization of auto-dimming daylight detecting lights
- 80% (4) have said yes, 0% (0) have said no, and 20% (1) have said in the planning stage for utilization of occupancy sensors
- 3 institutions did not respond to this question

QUESTION #8:

Please list or describe any other green initiatives your campus offers in the area of energy conservation that had not been previously mentioned (optional).

Olds College:

- Olds College has replaced old boilers with higher efficiency boilers

Lethbridge College:

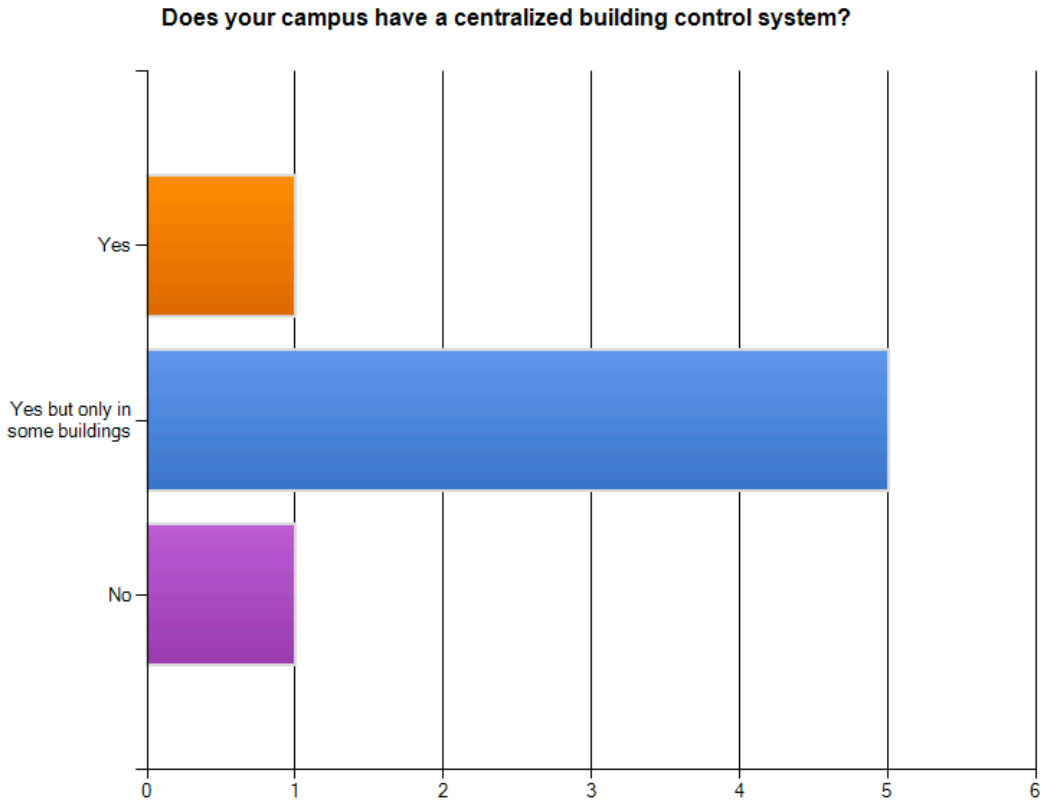
- Lethbridge College has upgraded its building heating and cooling systems to increase efficiency of components and system

Red Deer College:

- Red Deer College's newest building is LEED gold rated
 - The campus also promotes Earth Hour, National Sweater Day
 - Co-hosted documentaries and guest speakers to raise awareness
 - Will be hosting the 2nd Pathways to Sustainability conference in February 2011
-

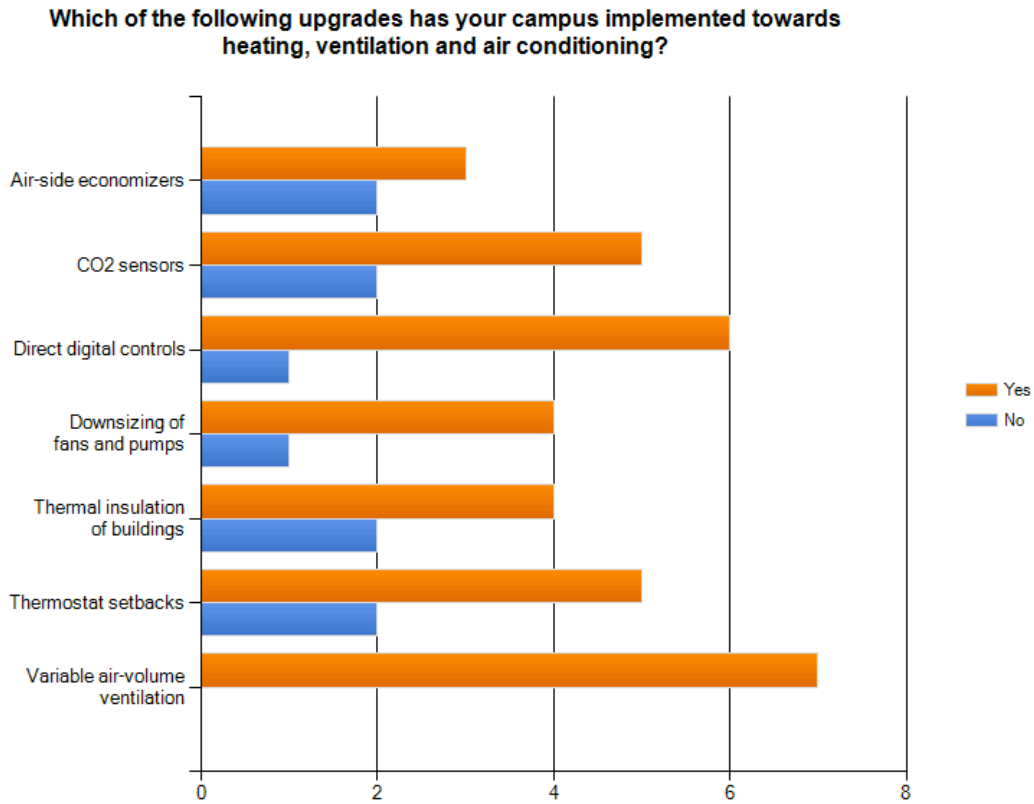
IV. Campus Design and Building Operations

QUESTION #1:



- 1 out of the 7 (14%) campuses that responded to this question said yes to having a centralized building control system
- 5 out of the 7 (71%) campuses said only some of their buildings were equipped with centralized building control system
- 1 out of the 7 (14%) campuses said their buildings were not equipped with centralized building control system
- 3 campuses did not respond to this question

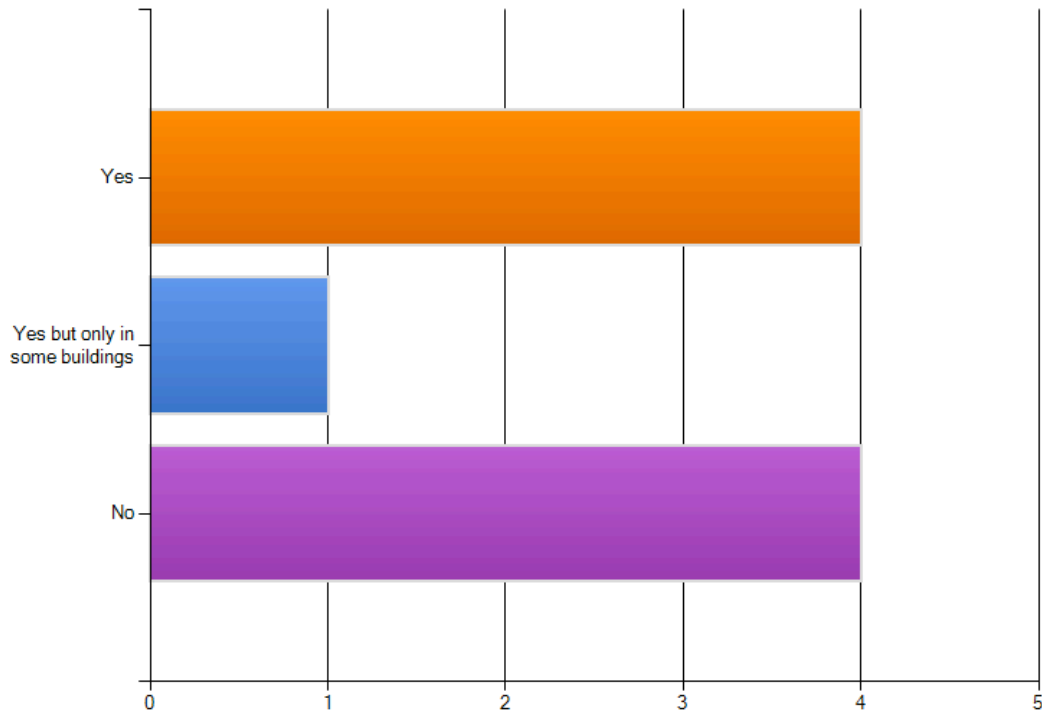
QUESTION #2:



- 60% (3) of 5 campuses that responded to this question said they have performed upgrades toward air-side economizers.
- 71% (5) institutions have said yes, while 29% (2) have said no to having CO2 sensor upgrades
- 86% (6) have said yes, while 14% (1) have said no to having direct digital control upgrades
- 80% (4) have yes, while 20% (1) have said no to downsizing any fans and pumps
- 67% (4) have said yes, while 33% (2) have said no to having any thermal insulation of building upgrades
- 71% (5) have said yes to thermostat setbacks, while 29% (2) have said no to having any thermal setback upgrades
- 100% (7) of respondents have said they have made upgrades to variable air-volume ventilation
- 3 institutions did not answer this question

QUESTION#3

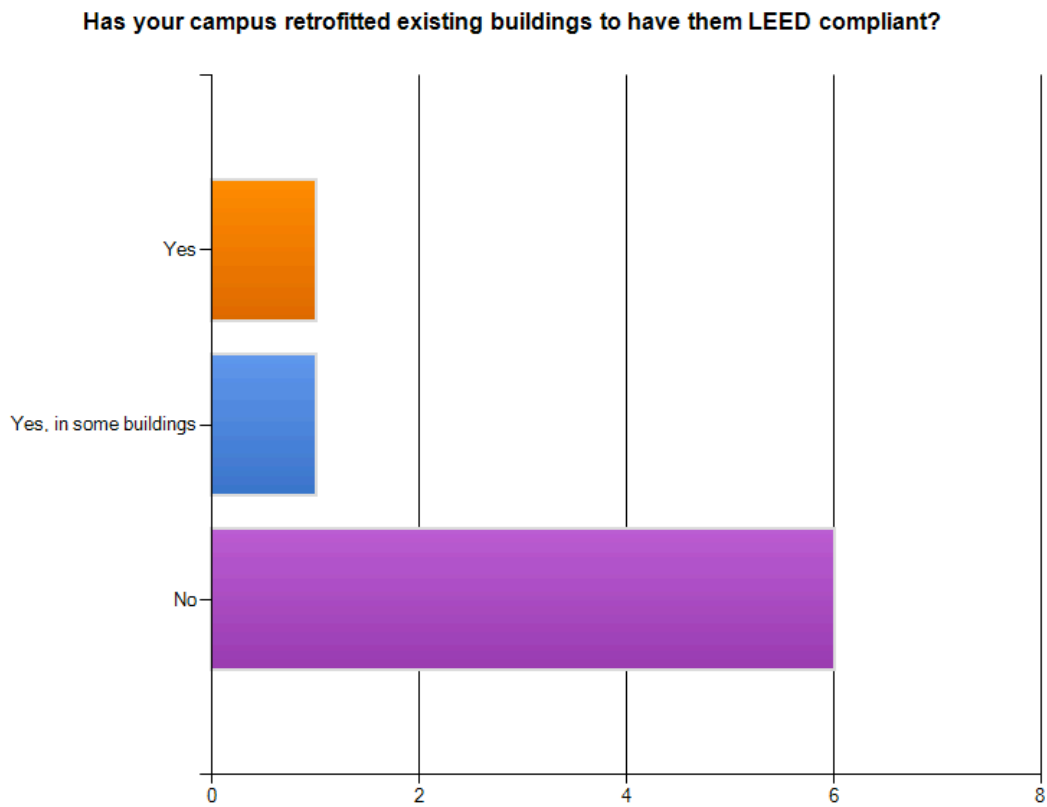
Has your campus implemented any LEED (Leadership in Energy and Environmental Design) certification for new buildings?



Of the 8 campuses that responded to this question:

- 44% (4) have said yes to implementing LEED (Leadership in Energy and Environmental Design) certification for new buildings
- 11% (1) have said they have implemented LEED (Leadership in Energy and Environmental Design) certification for some buildings
- 44% (4) have said they **have not** implemented LEED (Leadership in Energy and Environmental Design) certification for any buildings
- 1 institutions did not respond to this question

QUESTION #4:



- 13% (1) of participants said they have retrofitted existing buildings to have them LEED compliant
- 13% (1) of participants said they have retrofitted some building to have them LEED compliant
- 75% (6) of participants said they **have not** retrofitted existing building to have them LEED compliant
- 2 institutions did not respond to this question

QUESTION #5:

Please list or describe any other green initiatives your campus offers in the area of building operations and green space management that had not been previously mentioned (optional).

Olds College:

- Olds College have stated that they recently built new buildings to LEED silver standards but intentionally chose not to proceed with LEED certification as the administrative process was cost prohibitive

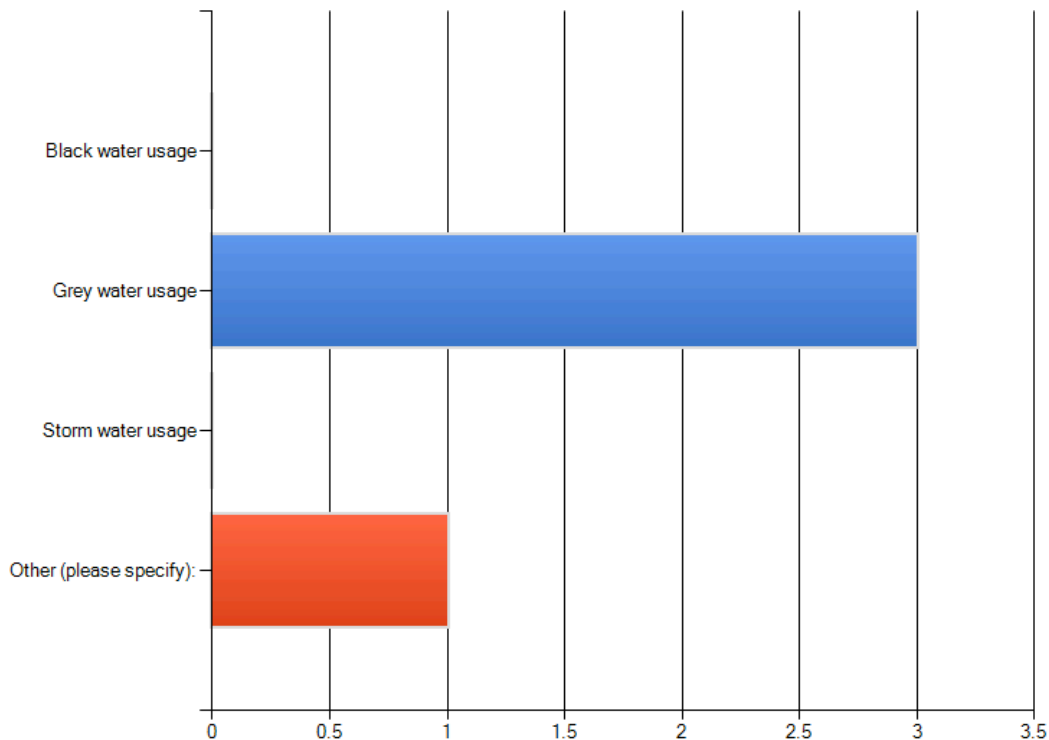
Lethbridge College:

- Lethbridge College have suggested their newest building to incorporate several sustainable features including rainwater capture; low VOC materials; passive solar; etc.
- BREEAM was used as a measure/model.

V. Water Conservation

QUESTION #1:

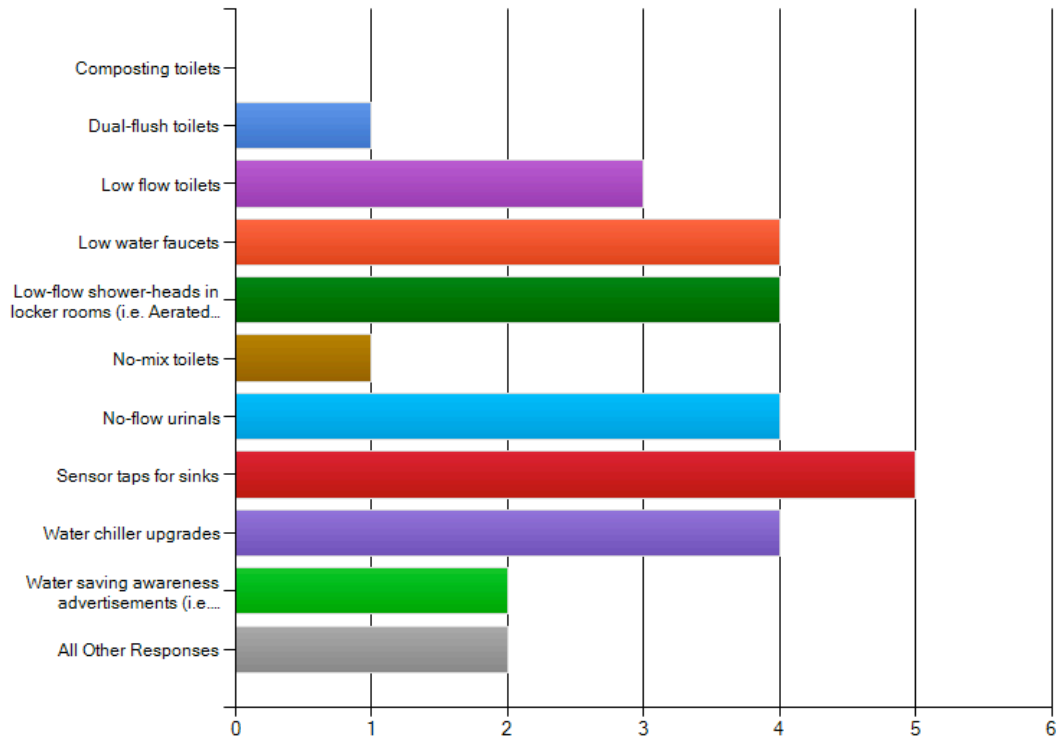
What re-usable strategies had your campus employed to decrease water usage?



- 0% of campuses employ the black water strategy as a way to decrease water usage
- 75% (3) of campuses employ the grey water strategy as a way to decrease water usage
- 0% (1) of campuses employ the storm water strategy as a way to decrease water usage
- Other comments:
 - Medicine Hat College: Stopped using potable water for irrigation
- 6 campuses did not respond to this question

QUESTION #2:

Has your campus employed any retrofits to curb water usage? Select all that apply:



When asked if any retrofits to curb water usage were made:

- 0% (0) of campuses have made retrofits to include composting toilets
- 12% (1) of campuses have made retrofits to include dual-flush toilets
- 38% (3) of campuses have made retrofits to include low flow toilets
- 50% (4) of campuses have made retrofits to include low water faucets

- 50% (4) of campuses have made retrofits to include low-flow shower-heads in locker rooms
- 13% (1) of campuses have made retrofits to include no-mix toilets
- 50% (4) of campuses have made retrofits to include no-flow urinals
- 63% (5) of campuses have made retrofits to include sensor taps for sinks
- 50% (4) of campuses have made retrofits to include water chiller upgrades
- 25% (2) of campuses have made retrofits to include water saving awareness advertisements
- 13% (1) of campuses have made **no** retrofits to curve water usage
- 13% (1) of campuses have included additional comments:
 - Olds College: Water from roof tops have been collected and used for campus irrigation
- 2 institutions did not respond to this question

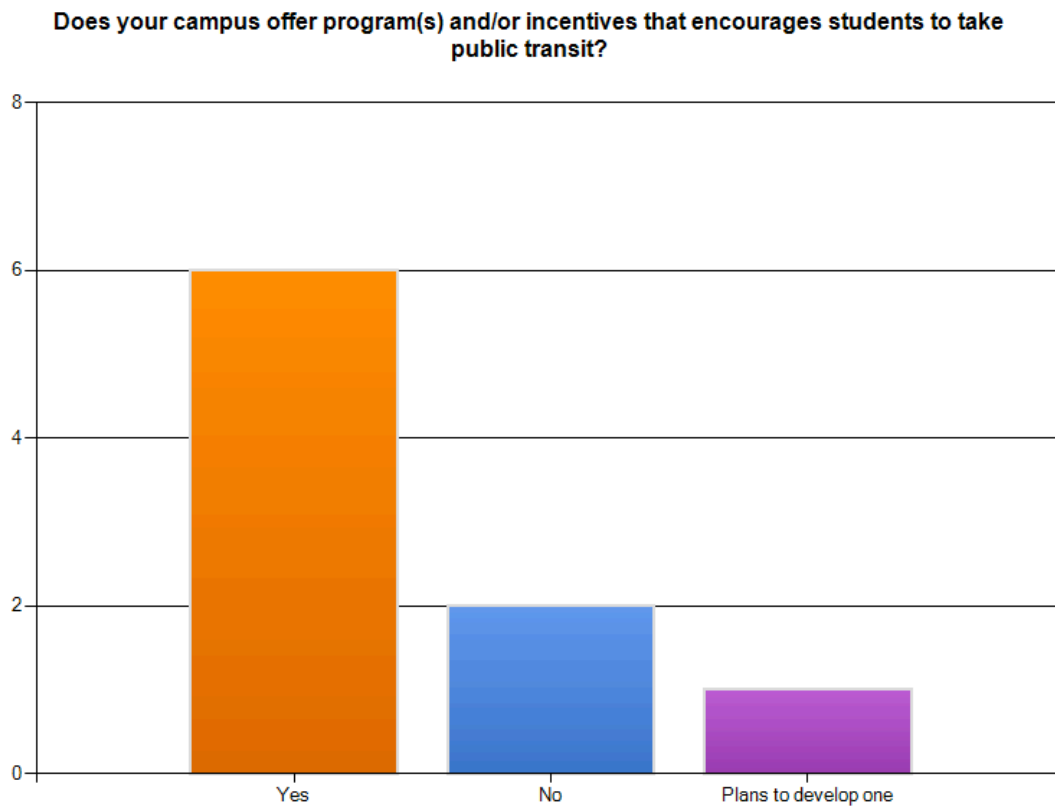
QUESTION #3:

Please list or describe any other green initiatives your campus offers in the area of water conservation that had not been previously mentioned (optional).

No institutions had additional comments to make.

VI. Public Transportation

QUESTION #1:

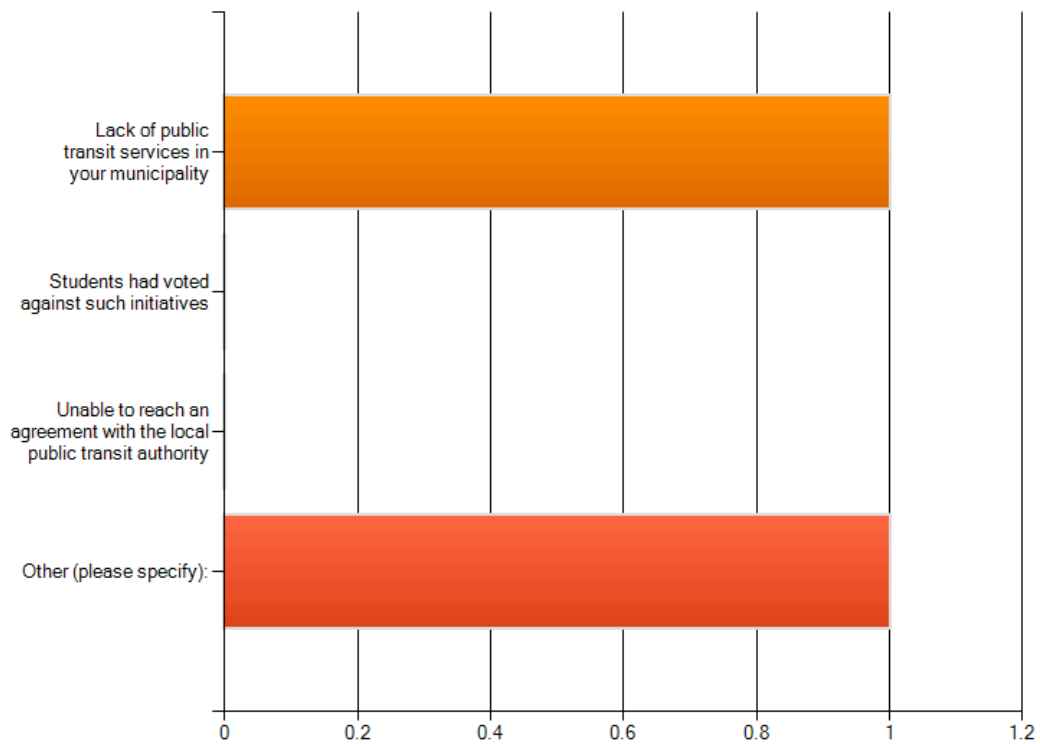


When asked if any program(s) and/or incentives are offered to encourage students to take public transit:

- 67% (6) of campuses said yes
- 22% (2) of campuses said no
- 11% (1) of campuses have plans to develop a program
- 1 institution did not respond to this question

QUESTION #2:

If you had answered no to the previous question, please indicate why:

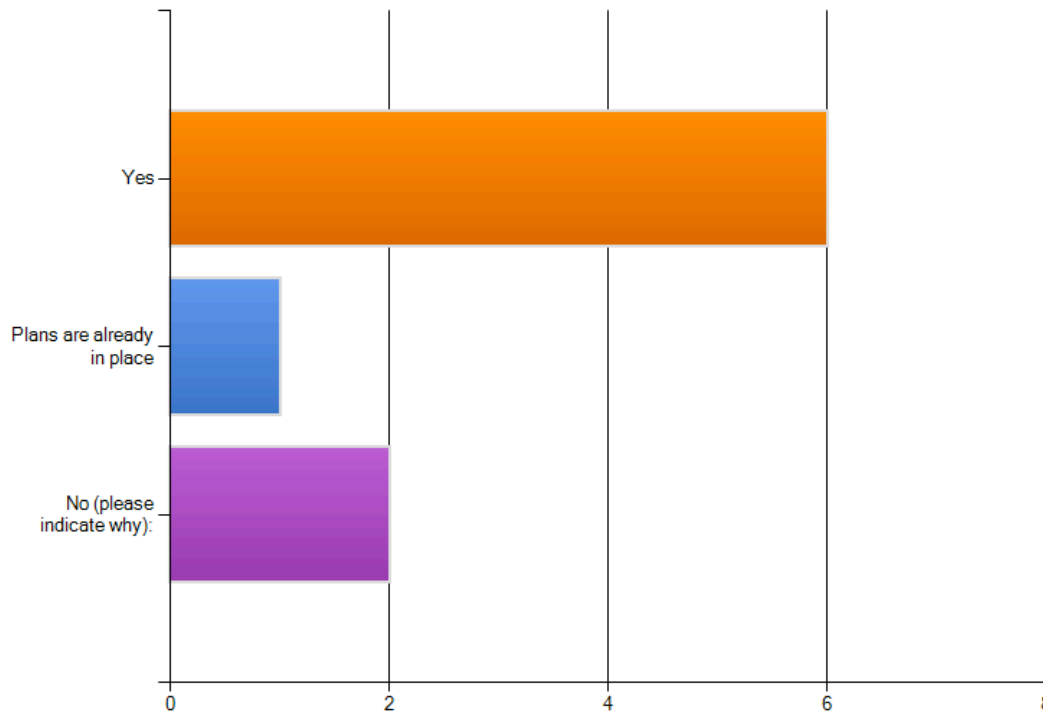


Respondents that had answered no in question #1 were asked to indicate their reason. The 2 campuses have said it was due to:

- Lack of public transit services in their municipality
- Distance education limited student contact

QUESTION #3:

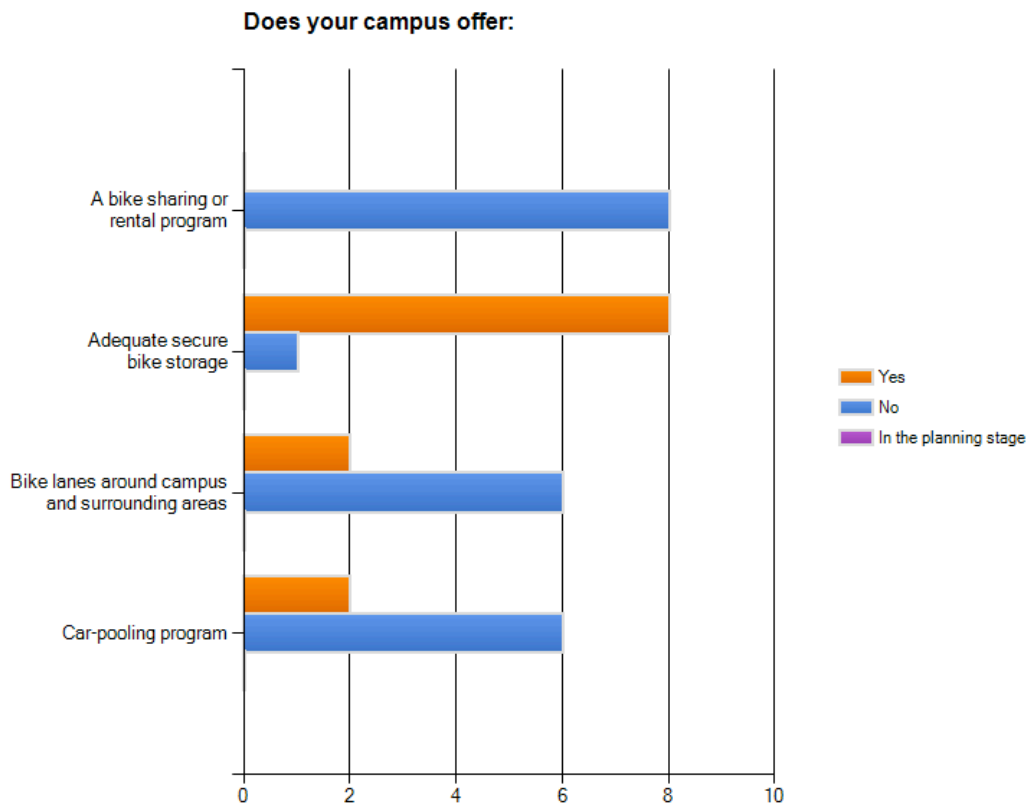
Does your campus offer program(s) or incentives that encourages staff/faculty members to take public transit?



When asked if any program(s) or incentives are offered to encourage staff/faculty members to take public transit:

- 67% (6) of campuses that responded said yes
- 11% (1) of campuses that responded said plans are in place to develop one
- 22% of campuses that responded said no with the reason that:
 - There are not enough interests
 - No local public transportation is available

QUESTION #4:



- When asked if they offer a bike sharing program:
 - 100% (8) of campuses that responded said they **do not** offer a bike sharing program
 - 2 campuses did not respond to the question
- When asked if they offer adequate secure bike storage at their campus:
 - 89% (8) have said yes
 - 11% (1) have said no
 - 0% (0) have plans to have one
 - 1 campus did not respond to the question
- When asked if they offer bike lanes around campus and surround areas:
 - 25% (2) have said yes
 - 75% (6) have said no

- 0% (0) have plans to do so
 - 2 campuses did not respond to the question
- When asked if they offer a car-pooling program:
 - 25% (2) have said yes
 - 75% (6) have said no
 - 0% (0) have plans to develop a program
 - 2 campuses did not respond to the question

QUESTION #5:

Please list or describe any other initiatives your campus has made but was not previously mentioned in the area of environmental sustainable transportation (optional).

No institutions had any additional comments to make.

VII. Additional comments

Please list or describe any other green initiatives available at your campus that was not previously mentioned in this survey.

The institutions that had additional comments have said:

Olds College:

- “Thanks for the opportunity to contribute to your survey. I would like to highlight that our Board of Governors recently established a Sustainability Committee. This committee is to address all three branches of sustainability – economic, social and environmental. While I commend you on this survey it is important that all three branches of sustainability be looked at together.”

Alberta College of Art and Design:

- “Sustainability, awareness, film series/discussion”

Athabasca University:

- “Dedicated shuttle bus service between two remote campus properties and main campus available for staff to commute and return on a daily basis M-F. This is a 300 km round trip commute.”

Lethbridge College:

- “We are a member of AASHE; we completed our first comprehensive, campus-wide sustainability audit in summer 2010; we have signed several agreements including the

Pan-Canadian Protocol for Sustainability; we have entered into a sustainable building technologies partnership with two other Colleges across Canada; we are currently working on a Strategic Sustainable Plan; sustainability related research includes a 'green' residence project in which we partnered with a local builder and the city; our Aquaculture Center of Excellence facilities and research incorporate sustainability.”

Chapter 4: Analysis

As we can see from the Alberta post-secondary institutions that participated in our study, a number of campuses undertaken initiatives to improve their carbon footprint; regardless, the urgency towards a greener campus and a more sustainable Alberta has been lacking in most campuses, leading to a number of mixed findings. The reasons for this are many, and interconnected. In this chapter, we attempt to untangle these reasons by using a analyzing political, economical, social, and technological (PEST) factors, as we will soon describe. Following a PEST analysis, we will then begin to examine the participating institutions through a SWOT analysis to investigate their current strengths and weaknesses, and future opportunities and threats to improvement. This analysis is then used to drive recommendations in the following chapter.

I. Political Factors

Many of the post-secondary institutions that responded to our survey had not shown much interest in a greener campus movement. According to our Policy and Administration section, 67% of campuses did not have any formal declaration in environmental sustainability while only 33% of participating campuses indicated they have an office of sustainability. While only one campus had plans to develop a sustainability office in the near future, no other campus had arrangements to sign a formal declaration to the environment. According to Chernushenko (1996), an effective environmental management system for any organization is one that is capable of defining the environmental and economic goals, policies and strategies of the organization, and implementing them (p. 1/1). This had not been the case for a majority of the

institutions, as no visible sign of a major commitment was at hand. As Chernushenko (1996) states:

Any organization committed to better environmental management must first define its goals. Policies, strategies and initiatives by which the goals can be achieved should then be developed ... [where it will be] inspirational and capable of influencing behavior. Through challenging and time consuming, 'the benefits are well worth the effort' because such a statement serves as the organization's principle means of focusing attention on this commitment. (p. 1/6)

According to our study, only 25% of respondents had completed a greenhouse gas inventory, while 7 of the 10 campuses that were asked what their campus diversion rate was for 2010 did not respond. This may have been because they did not know what that rate was, did not have any familiarity with the concept, or had no audit completed. Likewise, only three of the eight responding institutions said they had completed a greenhouse gas inventory. This comes together with the fact that at least 50% of participating schools have employed a new energy savings program to curb greenhouse gas emissions with the majority of campuses having spent money to increase lighting efficiency, heating ventilation and air conditioning upgrades. Lastly, a majority of campuses have indicated using various methods to decrease landfill wastes. This brings to us yet another area of concern: an organization that is serious about environmental management must conduct an environmental audit as it will affect the environment and how much resources are used (Chernushenko, 1996, p. 1/10). If schools are committing their efforts into sustaining cost and resources, yet do not gauge the efficiency of their work, educational

spending and resources may be at risk because it may even cost them more to develop and deliver programs.

Many campuses not committing to a formal declaration along with a minimal effort for most institutions in conducting an environmental audit of their progress may be partly due to insufficient government involvement. 2008-2009 figures have suggested there are 264,291 students enrolled in Alberta post-secondary institutions (Alberta Facts & Figures, 2010). That number would equate roughly to over 2.5 times the population of the City of Red Deer using campus facilities, creating wastes, using water, and contributing to greenhouse gasses (Population statistics taken from Reddeer.ca). However, when one examines the Alberta Ministry of Environment (2011) website, a dual problem emerges: Alberta post-secondary institutions are neither included as a contributor to environmental issues nor viewed as a cornerstone to facilitating the improvement of environmental stewardship through its educational sphere of influence. Nevertheless, there was \$810,316,000 spent on the 10 institutions that participated in our study in 2010 (Alberta Facts & Figures, 2010). At a grander scale, Alberta Facts & Figures (2010) suggests \$2,763,053,000 was spent on all publicly funded post-secondary institutions in the 2009-2010 year. If we are spending this much money on post-secondary in Alberta, we should improve upon the stewardship of investments made possible by creating awareness, educating, and encouraging Alberta higher education to become more sustainable in their practices. Investing in a long-term sustainable future will not only allow better efficiency on our spending, but also facilitate a healthier future for all of Albertans.

Table _: 2009-2010 Department funding and 2008-2009 student enrollment totals for post-secondary institutions that participated in our study

Participating Alberta Post-Secondary	Dept Funding 2009-10 Actual (in thousands)	Total Student Enrollment 2008-09 (Full-time + Part-time)
Alberta College of Art + Design (ACAD)	13,311	1,324
Athabasca University	48,909	38,543
Grant MacEwan University	107,204	17,671
Lethbridge College	44,065	6,434
Medicine Hat College	31,573	5,255
Mount Royal University	94,606	15,187
NAIT	177,082	29,455
Olds College	26,652	2,761
Red Deer College	49,400	7,269
SAIT	217,514	28,632
Total	\$810,316	152,531

Figures taken from: *Facts & Figures November 2010 Advanced Education and Technology*

Although not every Alberta post-secondary participated in our study, our research has touched upon Alberta’s publicly funded institutions from most sectors including comprehensive academic & research, baccalaureate and applied studies, polytechnical, and specialized arts and culture institutions. It seems clear that stronger government involvement can be a leading solution in the responsibility of these campuses to supply cost-effective yet sustainable solutions to environmental and campus-wide management. Altogether, this can enhance Campus Alberta’s vision of the province’s post-secondary institutions as world leading, cost-effective, sustainable, and attractive to students and leading researchers around the globe.

II. Economic Factors

Based on our results, long-term economic benefits with smaller expenditures appear to have an impact on whether or not Alberta campuses take on sustainability measures. For instance, to conserve utility costs, 50% of campuses have individualized electronic meters in some buildings while 33% of respondents have individualized electronic meters in all buildings. The results are even more revealing as, when asked, a majority of institutions have made retrofits to more efficient lighting fixtures, utilization of daylight controls, LED exit signs and occupancy sensors while having promoted energy conservation on campus. Other campuses including Lethbridge College and Olds College have replaced and upgraded their boilers and chillers to increase efficiency of system. As a result, these are some major indications that suggests when there are clear signs of economic benefits without the necessity to initially spend a bundle, action to conserve energy for the long run increases.

This, however, only appears to be the case with smaller costs because when the expenditures on sustainability increases, the chances of 'greening' a campus also decreases as was shown by our findings. When asked if existing buildings had been retrofitted to LEED compliancy, 75% of participants said no. Meanwhile only 44% of participating campuses said they had implemented LEED (Leadership in Energy and Environmental Design) certification for new buildings while only 1 campus (11%) said some of their new buildings were LEED certified. According to Enermodal Engineering (2011), to pursue LEED certification, certification fees paid out to the Canada Green Building Council [CaGBC] is between \$3,500 and \$16,000. Although LEED-rated costs would equate to roughly 0.3% of typical construction costs, or three months' of operating energy costs (Enermodal Engineering, 2011), those expenditures multiplied by the

many buildings incorporated by each campus would require significant amounts of spending. In addition to this, according to Alberta Finance and Enterprise (2011) Budget 2011 released by the Government of Alberta, the province has been experiencing an infrastructure freeze on capital projects on campus which will not aid the environmental challenges to come.

According to our results, although 67% of participating campuses said they had a full time staff working on sustainability on campus, only 30% of those campuses said they had an Office of Sustainability. This may be due to the increased financial burden of hiring a sustainability coordinator on campus as compared to having smaller staff, faculty members, or students from separate departments look at such issues. Although having the latter may appear to be more cost-effective, we will see in our weaknesses, opportunities and threats section that this may not be the most cost practical method of examining environmental stewardship.

Overall, whether or not Alberta campuses entail short or long-term operating costs to savings in their budget, the thought of expenditures to 'greening' their campus appears to be one of the biggest obstructions against sustainability on campus. Chernushenko (1996) however, states that being environmentally responsible with a major price tag attached to the notion is often misconceived as a myth that must be dispelled if real progress towards campus sustainability is to be achievable (p. 1/1). While institutions may choose either to address issues after they have occurred or to take precautionary steps to prevent pollution and environmental problems beforehand, the former will be expensive (Chernushenko, 1996, p. 1/1). Although pollution prevention may require investment of capital and time, it avoids a number of problems and expenses in the long term (Chernushenko, 1996, p. 1/1).

III. Social Factors

Although the Alberta Government has not taken a major lead in promoting environmental stewardship in Alberta post-secondary, we have seen a number of more established Alberta campuses take on various approaches towards environmental awareness across post-secondary communities. Campuses such as Grant MacEwan University, Olds College, and SAIT have indicated they have pledged to conserving the environment by signing one or more formal declarations and/or being a member of AASHE. Such commitments have many known advantages for campuses and the surrounding communities themselves. While these schools are acknowledged within the campus community as leaders in sustainability, such commitments also encourage community pride and public participation to be involved in such a movement.

A number of institutions have reinforced these actions by hosting and participating in community programs and events. For instance, Red Deer College has created an RDC Green Campus Task Group with a goal to educate the campus community of the importance of energy and water conservation and relevant environmental issues. The campus also promotes Earth Hour, National Sweater Day, and just completed hosting the second annual Pathways to Sustainability Conference with Rethink Red Deer bringing together more than 300 professionals, decision makers, innovators and investors generate ideas for a more sustainable future. Grant MacEwan University is also active in promoting programs and events to create awareness of sustainability. They have been involved in CAPS OFF FOR KIDS, Common Ground Week, and host staff and student Sustainability Forums to gain insight on what the campus community wants. Mount Royal University encourages the campus community to purchase environmentally

friendly products and to have them reflect before they buy by innovatively having an Eco store on campus. Lastly, Lethbridge College, Grant MacEwan University, and NAIT have an Office of Sustainability. This not only fosters a growing idea on campus, but more importantly works together with students, staff, faculty members and surrounding communities from the deviating ideas that may come into play towards a common theme of action. Altogether, campuses along with their active involvement in community run events have not only given the institutions a positive image in their communities, but also a clever approach to have its surrounding citizens take on a more healthier lifestyle in sustainability.

From our results, only one third of participating campuses said students are the main force to change on campus while another third said the opportunity for students and faculty members to work together in generating sustainable ideas on campus inspired by specially designed educational and/or research programs is important. Still, 44% said students are an integral part of identifying the institution's sustainability goals and practices. This was followed by 56% suggesting students play an important part in developing strategies and goals, but do not play a key role in the decision making process. All participating campuses, however, allow a student based approach to environmental stewardship on campus by having students join social clubs, gatherings, and extracurricular activities to have their ideas and opinions heard. Our findings appear to tend toward the direction where most campuses take on a student led approach to sustainable ideas on campus by encouraging students to join a number of clubs and gatherings on campus; although the majority of campuses perceive students as a crucial part in developing goals and action plans, students however do not have the final say in the decision making process. While the voice of the public does matter, leaders, executives, and the

governing body more knowledgeable in environmental stewardship seems to make the verdict on how sustainability on campus should be addressed. This method appears to work best with campus communities in our study. As a result, there is an excellent opportunity for the Alberta Government to take a stronger leadership role in the governing and coordinating sustainability practices on Alberta campuses. Based on the knowledge we have gathered and further future investigation into the province's post-secondary system, we can work together to create an achievable vision of sustainability for all of Alberta's post-secondary institutions.

IV. Technological Factors

Our results show that technological factors have been a stepping-stone to sustainable practices on campus. Although only 50% of participating campuses have stated to employing a new energy savings program to curb greenhouse gas emissions in the past 3 years, 50% and 33% of campuses had individualized electronic meters to some or all of the buildings respectively. Add the statistics together and that is 83% of participating institutions integrating the idea of individualized electronic meters to more appropriately gauge and curb energy levels in their buildings. The same can be conveyed for lighting initiatives where 83% have said lights have been retro-fitted (i.e. T12 to T8), 75% utilizing compact fluorescent lamps (CFLs), 71% implementing daylight controls, 83% employing LED exit signs, and 80% benefiting from occupancy sensors. When asked if upgrades had been made towards heating, ventilation, and air conditioning systems, a majority of campuses have had retrofits to their airside economizers, CO2 sensors, direct digital controls, and thermostat setbacks. A majority have also confirmed to having downsized their fans and pumps, increased thermal insulation of buildings with a 100% having upgrades to the variable air-volume ventilation. Only 44% and 11% of campuses in our

study have LEED certification in all or some of their new buildings respectively. Another 75% of participants have said they will not retrofit existing buildings to LEED compliancy. However, to complement those factors, technological building upgrades have been a major investment and have been a root to energy savings on campus to decrease greenhouse emissions.

Similar conclusions can be made for water conservation where 75% of participating campuses have employed the grey water method to decrease water usage regardless of only 33% affirming to having a water conservation program or policy in place. While only 13% of respondents have acknowledged they have not made any upgrades to curb water usage, a majority has included no-flow urinals, low-flow showerheads, and sinks with sensor taps as part of their water conservation strategy. With these findings, it is clearly visible that the campuses in our study have taken a strong initiative through technological means to upgrade their building systems to curb water usage regardless of having a water conservation program in place.

In the Waste and Recycling section of our findings, a number of ways have been used to recycle and reduce waste caused by technological factors on campus. 70% limit their packaging, 80% employ the re-use strategy such as having a two-sided printing policy or repairing an item if possible, 90% sell or donate re-usable items, while another 90% replace waste baskets with clearly marked recycle containers. While printer cartridges and electronics such as monitors, printers and computers are recycled, so are paper, batteries, and cell phones. Having a waste reduction and recycling program in 90% of participating campuses coupled with a strong purpose to recycle and re-use has made the use of technology at participating Alberta campuses more eco-friendly.

The availability of public transportation within a campus community has also been a major impact to whether or not the schools offer or encourage students and staff to take public transit. According to our findings, 67% of participants acknowledged to having a program and/or incentive to encouraging the use of public transportation in students and/or staff. While another 11% said plans are in place, the remaining reasoned that no local transportation was available for such an initiative. From our findings in public transportation, we may conclude that a core-underlying factor to encouraging sustainable minds on campus may be the availability of resources to make sustainability a growing success.

V. Strengths:

Based on our findings, there have been a number of strengths in the sustainability initiatives of Alberta post-secondary institutions we studied. Although the majority of institutions were not committed to any formal declaration nor did most institutions complete any form of environmental audits, we have seen a number of campuses think 'green' by taking on various approaches towards a sustainability movement across post-secondary communities. To name a few, Red Deer College, SAIT, and Mount Royal University have stated in our survey they do not have Offices of Sustainability. Regardless, Red Deer College has a RDC Green Campus Task Group and have partnered with Rethink Red Deer to host the 2nd annual Pathways to Sustainability Conference; SAIT has contracted PCL to build a \$450 million dollar Trades and Technology Complex that is compliant with PCL's environmental goals; and Mount Royal University has a sustainability center that runs workshops and brings in sustainable businesses and groups to lead them. Overall, all participating institutions support student led initiatives by

encouraging students to join social clubs and gatherings to bring in innovatively fresh ideas and feedback on green campus planning.

Although 30% of responding institutions said they did not have a Sustainability Office, a majority of campuses had suggested they still had a full time sustainability staff at their schools. This may have triggered a number of other environmentally friendly practices on campus as this has been correlated with waste reduction, recycling, and energy savings program on campus with very high results. A number of other campuses are also involved in the recycling of textbooks and cell phones, and CAPS OFF FOR KIDS Program. Lastly, Mount Royal University encourages the campus community to purchase environmentally friendly products and to have them reflect before they buy by innovatively having an Eco store on campus. Olds College and SAIT also acknowledged that they have a research department dedicated to the study of climate change, sustainability, and clean energy. This not only promotes sustainability, but also will pioneer a growth in knowledge into the field in the coming years.

VI. Weaknesses and Opportunities

Although evidence of new environmentally friendly practices have been visible in participating post-secondary institutions across Alberta, more coordinated efforts are still required for us to be sustainability leaders in Canada.

As Chernushenko (1996) recommends, an organization committed to better environmental management must define their policies, strategies and initiatives by which their goals can be achieved before any behavior may be influenced (Greening Campuses, p. 1/6). This however was not the case for the majority of participating campuses as their responses in the

Policy and Administration section showcased a lack of commitment to any formal declaration to further their successes on tackling sustainability issues. Although 67% of respondents indicated they had a full time staff focused on sustainability on campus, only 3 of the 10 participating campuses had a Sustainability Office. A Sustainability Office would have multiple benefits: it would collaborate and converge on ideas generated by staff members from different departments working on sustainability; it would demonstrate to students, staff and faculty that their campus is a learning environment they can be proud of; and it would show that the campus is taking a serious role in implementing environmental stewardship. Moreover, having a visible Sustainability Office on campus will encourage the school community to advocate for campus policies regarding sustainability; likewise, it will be part of the growing movement to actively seek out new goals and plans of action to reduce their carbon footprint in their community. Most importantly, the institution's president or executives should be aware of and either sign a formal declaration or declare policies regarding environmental stewardship for the sustainability movement to be a grand success. According to Chernushenko (1996):

A good structure for campus environmental management takes a simultaneous top-down and bottom-up approach. First, support for this significant shift to sustainable practices must come from the top. Not only must the most senior people interested in the case, they must be seen to be so. They must be "champions" of the cause, showing vision and leadership. They must demonstrate commitment and a willingness to take risks, if the entire organization is to view this as a serious exercise.

Second, people throughout the organization must be a part of such an initiative. They need to believe that they have an equal stake in achieving better environmental

management and that they will share in its benefits. This requires that all members of the organization be involved in the development, implementation, monitoring and enforcement of the initiative. (p I/4)

Furthermore, regardless of how much effort has been placed into sustainability at one campus, an environmental audit should be exercised to fully measure the progress of their efforts. Chernushenko (1996) further explains that an organization that is serious about environmental management should conduct an environmental audit (p. I/10). There are general and specific types of audits depending on the area of interest; regardless, an audit not only demonstrates where an organization compares to, but also how well they are doing along with where there may be room for cost-effective resource-saving improvements (Chernushenko, 1996, p I/10). Given limited spending is available, audits can be performed by qualified volunteers or staff members who may use questionnaires of their own design or borrowed from other organizations (Chernushenko, 1996, p. I/10). The advantages of having an outside specialist however, includes an unbiased opinion raising the level of trust in their findings (Chernushenko, 1996, p I/10). Meanwhile being more knowledgeable in “leading-edge” practices will allow them to spot issues that may elude less-experienced auditors (Chernushenko, 1996, p I/10). In our survey, 7 of the 10 participating campuses voluntarily did not respond to what their campus diversion rate was in 2010 while 5 of the 8 institutions have noted they did not complete a greenhouse gas inventory. This is a clear indication that assessment strategies are required in Alberta campuses to elude the wasting of time, government spending, and careless use of resources.

Altogether, leaders of post-secondary must take on sustainability initiatives by engaging in a campus vision. This should be encouraged through having well-defined policies in place and pledging to a formal declaration to have environmental stewardship fall into place. Having an environmental audit will allow the schools to gauge the seriousness of their actions by measuring their progress towards better cost-effective, resource-saving techniques.

VII. Threats

Based on our accumulated results, there are visible signs of sustainability practices for most participating institutions; however, the correlation between certain areas of our study and others are not strong and appear to be multidirectional. This will lead to threats in our community and major strain on Alberta's top quality of education based on allocated spending towards the careless use of resources.

Although a high percentage of participants indicated they have a waste reduction strategy in place along with ways to reduce solid wastes, 7 of the 10 participating campuses did not respond to what their campus diversion rate was in 2010. This may be because they do not know what it was, did not have any idea of the concept, or simply had no audit completed. Given no diversion rate was completed, this may be a huge threat to the environment. Schools will not be able to gauge how much waste was diverted from landfills, what comparisons to be made to better themselves, and whether or not there were any progress to achieve maximum efficiency. Altogether, campuses may simply be wasting their money on waste reduction strategies without a proper audit. Campuses may spend their funds, thinking they are contributing to the reduction of landfill wastes when in fact, the same amount of wastes are

going into the system. From our findings, a common theme has arose about greenhouse gases and the same explanation can be said when 5 of the 8 institutions have noted they did not complete a greenhouse gas inventory.

Campuses that indicated they had completed a greenhouse gas report were then asked which model and inventories they had examined. Although only two institutions in our study had completed a greenhouse gas inventory, different models were used. Grant MacEwan University employed the GHG Protocol where purchased electricity, steam, heat, and cooling energy were inventoried. On the contrary, Athabasca University engaged the Carbon Calculator Model in which natural gas combustion, transportation, commuting and waste disposal was accounted for. Although both institutions must be given credit for their efforts in assessing their own greenhouse gas contributions, a single system for greenhouse gas inventories should be universalized as for all campuses to use and compare their ratings. By doing so, campuses may judge themselves on a scale that will be on par with other post-secondary schools. This will yield a more precise comparison and ability of higher education to exchange recommendations at the same equal level.

In the Weaknesses and Opportunities section of this chapter, we touched upon the significance of having an Office of Sustainability on campus. The absence of a Sustainability Office may be one of the largest threats against the growing success of environmental stewardship in Alberta higher education. According to the American Association for Higher Education (AASHE), “of the many [sustainability] initiatives introduced in the last forty years, few have taken hold, and most institutions, at least in terms of their basic curricular structure, operate today much as they did yesterday (as cited in Barlett & Chase, 2004 , p. 10). There is

such a huge barrier to change because resources are linked to disciplines (Barlett & Chase, 2004, p. 10). Although sustainability “encompasses a range of disciplines, including the arts, humanities, economics, political science, history, other natural sciences, anthropology, as well as work in professional programs such as business, engineering, law, and health professions ... sustainability by itself is interdisciplinary in nature and cannot be condoned off into one area of the curriculum (Barlett & Chase, 2004, p. 10-11). At the end, the institution structure yields a status quo that discourages against interdisciplinary work because faculty members are mainly rewarded for their research and teachings and In the end, “Institution structure gives rise to a status quo that militates against interdisciplinary work as faculty members are rewarded primarily for their research and teachings and scholarship related to their disciplines, and they are discouraged from moving across disciplinary boundaries (Barlett & Chase, 2004, p. 10). We can relate Barlett & Chase’s ideas back to our findings. 67% of campuses in our study have a full time staff focused on campus sustainability; regardless, only 30.0% participating institutions indicated to having an Office of Sustainability. Although campuses should be given credit for having a full time staff focused on environmental issues, this may not be the most effective way of tackling the topic. As Barlett & Chase (2004) examines, competing interests in higher education may make change difficult many. Even when the president and campus executives are prepared to adopt environmental guidelines, students, their parents, different faculties, alumni, board of trustees, and local communities all will have legitimate claims on the energies of the school, resulting in conflicting ideas toward a campus wide solution (Barlett & Chase, 2004, p. 14). By having an Office of Sustainability organizations will however, be able to coordinate ideas brought forth to them from individual departments; this will give them the

edge in generating a feasible one-campus vision. In addition, this will save time, money, and a strongly unilateral direction for a school wide goal and theme. Lastly, investing in a Sustainability Office at each campus will allow Alberta post-secondary to coordinate ideas, provide feedback, and grow together with ease. This will guide the way to time and cost-savings in the allocation of our educational dollars, and most importantly provide an effective harmonized plan that will bring Albertans to the forefront of a cleaner, healthier, more environmentally sound future.

Chapter 5: Conclusion

In our report, we examined the sustainability initiatives in 10 of Alberta's publicly funded post-secondary institutions. Our research has been critical to our province's higher education sector as a number of sources have linked to increased student enrollment. While M'Gonigle and Starke's (2006) research suggests that Canadian student enrollment will increase by 30% over the next 10 years (p. 35), a report conducted by the Government of Alberta Education (2009) have also seen similar trends with notable increases in the province's high school to post-secondary transition rates from 2004 to 2008 (p. 178). With \$2,763,053,000 spent on all publicly funded Alberta campuses (Advanced Education and Technology, 2010) along with a student population roughly 2.5 times the population of Red Deer (Advanced Education and Technology) contributing to a carbon footprint, it is imperative that we gain a better understanding of Alberta campuses and their ingenuity at being cost-effective and more environmentally friendly in their practices to facilitate a healthier future for all of Albertans.

Environmental sustainability is a relatively new field. To gain better insight into how crucial it is to campus lifestyle and our way of living, we began our report with a literature review. In our scan, we investigated previous research studies, literatures dedicated to environmental stewardship, and progress that had been made over the years in the field. Employing Survey Monkey as our questionnaire instrument, we were then able to touch base with participating campuses on a number of critical areas including Policy and Administration, Campus Design and Building Operations, Water Conservation, Public Transportation, and Waste, Recycling and Energy Management. Our results indicated that most participating campuses did

not have an Office of Sustainability, pledge to a formal declaration in environmental stewardship, or environmental audits in place to gauge the progress of their stewardship efforts. As well, most campuses did not have partnerships with businesses, organizations, and/or government programs to encourage environmental sustainability. Participating campuses did however have a full-time staff working on sustainability, along with significant efforts in curbing energy, wastes, and water levels and encouraging public transportation. Lastly, 100% of campuses believed in a student opinionated approach to sustainability with the final decision ruled out by leaders, executives, and the governing body more knowledgeable in eco-friendly stewardship.

1. Challenges and Opportunities for Future Research

What we found to be a challenge was that our research embarked at a time when a number of Alberta post-secondary institutions had just made the transition from college to university status, including the newly named Grant MacEwan University and Mount Royal University (Advanced Education and Technology, 2009). This, added with the fact that most of our respondents were colleges rather than universities, may have created an unfair representation for a number of campuses in questions such as whether or not their campus offered a masters program or research program in sustainability.

We also realize following our study that not all questions in sustainability can be addressed to every province in a similar manner. For instance, according to the Ontario Ministry of Training, Colleges and Universities (2011), there are 20 public universities and 24 colleges in their province. Alberta however, follows a six-sector model that includes universities and

colleges, but also arts and cultural institutions, and polytechnic institutions. Thus, for a better insight into graduate-level sustainability research, courses, and program offered in Alberta, future research should take care to include Alberta universities that grant graduate degrees.

Another major challenge we had was timing in which our study was narrowed from 6 months to 4 months due to the funding challenges during the beginning months of the project. While a number of institutions did not respond to our emails and phone calls for an invitation to participate in our study, others had chose not to participate due to time constraint for a rather complex and challenging questionnaire. Meanwhile, a number of campuses either did not have a Sustainability Office, sustainability staff not getting back to us, or had anyone to turn to that were interested enough to complete a survey on campus sustainability. As a result, there were a larger number of campuses than expected in which we had to turn to the Students' Association to complete our questionnaire. We soon realized the issues with having a Students Association member complete our survey. Because campus sustainability was not most of the members' area of expertise, we were unable to get a full response for a number of questions. For future research, with more time and ability to track down building management and sustainability staff in charge of specific areas covered by our study, we will be able to receive more feasible and complete results. As well, providing campuses with more time may allow campus staff to locate the proper information to complete future questionnaires.

Lastly, our research has covered the sustainability measures in participating Alberta campus along with the reasoning that long-term investments in environmental stewardship will yield cost-effective returns. However, our investigation has been mainly focused on the environmental component of sustainability rather than the economics domain. As a result,

there will be room for further research with a larger focus on the economics and how much Alberta campuses are really spending and saving based on their sustainability practices.

II. Policies and Recommendations

We explained our results subsequently as a combination of political, economical, social, and technological factors. Consequently, we completed an investigation of our campuses' strengths, weaknesses, opportunities for improvements, and threats to our community life style. Most notable and repetitive in our analysis was the fact that most campuses did not have a pledge to a formal declaration leading to policies in which Chernushenko (1996) states, is a requirement for influencing behaviors (p. 1/6). As a result, Alberta campuses should implement environmental policies and the initiative to commit to a formal declaration to the environment for the campus community to become really involved.

As well, we came to the conclusion that educational dollars, time, and environmental resources might be at risk without the proper audit to measure the progress of their work. Retrofits to building systems, which had been the case for most campuses, may not have been worthwhile without the proper assessments. Thus, to realize the effectiveness of their sustainability measures, Alberta campuses should take the initiative to gauge the progress of their actions. We then found that although most campuses had a full-time staff working on sustainability, many did not have an Office of Sustainability. As we had stated, this may had been one of the largest threats against the growing success of environmental stewardship in Alberta higher education. Having an Sustainability Office will not only allow the collaboration of ideas within campus and ease the network of ideas between Alberta post-secondary, it will

create a wholesome approach to environmental stewardship as oppose to divergence in opinions between dissimilar parties and disciplines.

Lastly, we found that 100% of campuses believe in a student opinionated approach and appears to work best when leaders and higher authority more knowledgeable in sustainability make the final decisions. We should extend these findings to a broader approach for Alberta campuses where the Alberta Government should, from a hierarchy standpoint, take a stronger lead in the governing of sustainability practices of Alberta campuses. This will allow institutions to have better guidance, leading to a more achievable vision for all of Alberta’s post-secondary institutions in terms of policies, audits, and having a Sustainability Office.

Below are tables summarizing the three core areas from our findings in which we believe should be a major area for progress. We believe improvements in these areas will pioneer gradual success for Alberta campuses in sustainability.

A. Policies and Practices:

Issue found	Recommendations for improvement
<ul style="list-style-type: none"> • Most participating campuses have shown notable efforts of curbing water, energy, and wastes through various building system retrofits and practices • 67% of campuses have indicated to not having any formal declaration to the environment, thus, no major signs of a major commitment are at hand 	<ul style="list-style-type: none"> • Improve upon the sustainable practices of Alberta campuses <ul style="list-style-type: none"> ○ Can be made possible by increasing government intervention to create awareness, educate, and encourage Alberta higher education to be more sustainable in their practices ○ Investing in a long-term plan will allow efficient spending and facilitate a healthier future for all Albertans

	<ul style="list-style-type: none">• Defining economic and environmental goals and a formal pledge to sustainability<ul style="list-style-type: none">○ Policies, strategies, and initiatives inspire and influence behaviors on campus, leading to a long-term healthier lifestyles in the community○ Serves as the organization's principle means of focusing attention on this commitment
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B. Environmental Auditing

Issue found	Recommendations for improvement
<ul style="list-style-type: none"> • Many participating Alberta campuses appear to have a poor understanding and uptake of environmental auditing <ul style="list-style-type: none"> ○ Only 25% of respondents completed a greenhouse gas inventory ○ 70% of campuses when asked what their campus diversion rate was for 2010 did not respond possibly because they: <ul style="list-style-type: none"> ▪ Did not know what the rate was ▪ Was not familiar with the concept ▪ Had no audit completed • Schools are committing their efforts into sustaining costs and resources through various retrofit programs <ul style="list-style-type: none"> ○ However time, educational spending, and environmental resources may be at risk without the proper audit to measure the progress of their work ○ May cost them more to develop programs and retrofitting without knowledge of where they stand 	<ul style="list-style-type: none"> • Thus, we strongly recommend each campus complete an audit • This will provide consistent and accurate measurements of on-campus consumptions while benchmarking success of their sustainability efforts <ul style="list-style-type: none"> ○ Thereby allowing openness for improvements and encourages schools to better themselves in these areas

C. Office of Sustainability

Issues found	Recommendations for improvement
<ul style="list-style-type: none"> • 30% of participating campuses have a Sustainability Office <ul style="list-style-type: none"> ○ 67% of campuses said they had a full time staff working on sustainability • Absence of a Sustainability Office may be one of the largest threats to stewardship in Alberta higher education as <ul style="list-style-type: none"> ○ This creates a barrier to change due to conflicting disciplinary views ○ More parties interested in the future of higher education means the emergence of more conflicting views against a campus-wide solution 	<ul style="list-style-type: none"> • We strongly recommend creating an Office of Sustainability on each campus to: <ul style="list-style-type: none"> ○ Actively seek out new goals and plans of action to reduce carbon footprint ○ Collaborate and converge on ideas generated by student and staff members from different departments working on sustainability ○ Demonstrate to the school community their campus is taking a serious role in environmental stewardship ○ Visible office on campus would encourage advocacy to campus policies regarding sustainable practices ○ Allow Alberta post-secondary to network, dialogue, and coordinate ideas and provide feedback between campuses with ease

Altogether, our report has attempted to provide foundational knowledge on Alberta’s post-secondary institutions and their current sustainability practices. We hope our findings will encourage future research projects to build on this knowledge and encourage better environmental stewardship practices and policies for Alberta’s important educational resources.

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