

COUNCIL OF  
ONTARIO UNIVERSITIES

CONSEIL DES  
UNIVERSITÉS DE L'ONTARIO

**ONTARIO UNIVERSITIES:**  
**GOING**  
**GREENER**

---

**REPORT OF CAMPUS SUSTAINABILITY INITIATIVES - NOVEMBER 2010**



Prepared November 2010 by:  
Council of Ontario Universities  
Conseil des universités de l'Ontario  
180 Dundas Street West, Suite 1100  
Toronto, Ontario M5G 1Z8  
[www.cou.on.ca](http://www.cou.on.ca)

For more information contact:  
Sharon Berman  
Executive Director, Corporate Services  
416.979.2165 ext. 221  
[sberman@cou.on.ca](mailto:sberman@cou.on.ca)

ISSN: 1920-7352 (ONLINE)  
ISBN: 0-88799-455-5  
COU No. 839

## Foreword

### Message from the President and CEO



Environmental sustainability represents one of the most pressing issues of our time. Our dependence on fossil fuels, our consumption patterns and the amount of waste we generate will all have lasting impacts on our planet and on future generations. Universities are uniquely positioned to help generate the knowledge we need to overcome these challenges and to test new technologies and management practices at their campuses.

This annual report, *Ontario Universities: Going Greener 2010*, presents many campus sustainability initiatives across the province. It sets out to gauge how the sector is moving towards being more environmentally sustainable. The Council of Ontario Universities (COU) supports the Government's leadership in building a green economy. Universities are working harder than ever to ensure that programs are in place to develop necessary skills, and that they are demonstrating leadership in greening their own operations.

The sector is committed to doing its part to help address the environmental issues that impact our quality of life, and that of future generations. We recognize that the solutions for addressing these challenges are complex and require effort from all sectors. We are engaging with the Broader Public Sector and the private sector at a Forum on November 4, 2010, where experts from across the MUSH Sector (Municipalities, Universities, Schools and Hospitals) and industry will convene to discuss challenges and share best practices moving forward.

Understanding where we are now, and where we need to go, are critical steps for determining where to place our efforts to ensure that we are doing all we can to guarantee a competitive and sustainable future for Ontarians.

**Bonnie Patterson**  
COU President and CEO

## List of Participating Institutions

Brock University

Carleton University

University of Guelph

Laurentian University

McMaster University

Nipissing University

OCAD University

University of Ontario Institute of Technology

University of Ottawa

Queen's University

Ryerson University

University of Toronto – St. George Campus

University of Toronto – Mississauga Campus

University of Toronto – Scarborough Campus

Trent University

University of Waterloo

University of Western Ontario

Wilfrid Laurier University

University of Windsor

York University

# Table of Contents

Foreword.....	2
Message from the President and CEO .....	2
List of Participating Institutions .....	3
Table of Contents .....	4
Executive Summary.....	5
Introduction .....	7
Background .....	8
Policy Drivers.....	9
Building a Green Culture .....	9
Green Policy .....	10
Green Budget and Investment.....	10
Dedicated Staff.....	11
Student Involvement .....	13
Reducing Environmental Impacts .....	14
Emissions and Energy Use.....	14
Green Buildings.....	16
Green Transportation .....	18
Waste Management .....	19
Water Management.....	20
Nature Conservation .....	22
Green Procurement .....	23
Teaching and Learning .....	24
Green Courses and Programs .....	24
Environmental Research .....	28
Green Partnerships .....	28
Barriers and Best Practices .....	30
Moving Forward.....	32
Appendix A: Methodology .....	34

## Executive Summary

### Going Greener at Ontario Universities

In 2010, Ontario's universities showed that they are doing more than ever before to track and implement green initiatives.

- New degree programs offered to students help build the skills needed for a green economy. Fifty per cent of university respondents now have direct-entry environmental PhDs, compared to 35 per cent in 2009. Seventy-nine per cent have undergraduate programs focused on environmental issues, and 60 per cent have direct-entry environmental Master's degrees.
- Respondents indicated that engaging stakeholders across campus in sustainability efforts is very important. Ninety-five per cent of Ontario universities have multi-stakeholder groups dedicated to environmental sustainability. Additionally, students are important stakeholders in the environmental efforts of Ontario's universities, and 75 per cent indicated that students are key drivers of change at their institutions.
- University campuses also generate more renewable energy than ever before. Sixty per cent generate one to 40 per cent of their energy through renewable sources, compared to 29 per cent in 2009. Solar electric (photovoltaic) power is the most widely produced at 75 per cent (up from 60 per cent in 2009). Ten per cent of respondents take advantage of the Ontario government's feed-in tariff program that was introduced as part of the Green Energy Act, and a further 70 per cent have plans to do the same.

Environmental sustainability is an issue of key importance to Ontario universities and every year they are doing more to achieve it.

Universities:

- take action to make their campuses more sustainable
- build the skills required in a green economy
- foster the development of green technologies, goods and services
- partner on collaborative initiatives aimed at improving the environment

Ontario universities pledged in 2009 to assist in finding solutions to the challenges of environmental sustainability; to share knowledge about sustainability and climate change; and to incorporate principles of sustainability into their own operations wherever possible.

Now universities respond annually on their environmental progress in a survey administered by the Council of Ontario Universities (COU). The 2010 Survey (the second to date) covers four categories:

- building a green culture
- reducing environmental impacts
- teaching and learning
- barriers and best practices

- Locally-sourced food is increasingly accessible at Ontario universities – its availability grew to 85 per cent in 2010 from 71 per cent in 2009. This trend is in line with the goals of Ontario’s government, who recently introduced the Broader Public Sector Investment Fund to help connect farmers, food processors and distributors with schools, hospitals and municipalities to increase the amount of Ontario food purchased by the broader public sector.

## **Other Key Findings**

### **Building a Green Culture**

- Eighty per cent of Ontario universities made a formal declaration of commitment to environmental sustainability, aside from the one administered by COU in 2009. An additional 15 per cent have plans to make one.
- Not only have Ontario universities made formal commitments to environmental sustainability, but 40 per cent are also currently conducting campus-wide assessments and reports on their progress, and 45 per cent have plans to do so, according to a new survey question this year.
- The number of employees dedicated to sustainability at universities is on the rise. In 2010, universities reported that they employ 47 full-time equivalents (up from 38 in 2009).
- Universities recognize the need to track costs and savings from their investments to build better business cases, and 70 per cent already track the financial implications of their green initiatives.

### **Reducing Environmental Impacts**

- University buildings are becoming more environmentally friendly. Eighty per cent have implemented green roofs on some part of their campus, up from 64 per cent in 2009. Fifty-five per cent of universities have incorporated a sustainable roofing standard on at least some of their buildings, compared to 41 per cent in 2009.
- University facilities are enhancing building efficiency, using updates to heating, ventilations and air conditioning, lighting and IT. Also, 90 per cent of universities are using electronic meters for measuring energy on some campus buildings, since tracking is key to improvement.
- Ontario universities are working to reduce the amount of waste they generate. A new question in 2010 revealed that 95 per cent track their waste composition. Eighteen campuses have diverted 30 to 80 per cent of their waste from Ontario’s landfills, whereas in 2009, four campuses were at a 21 to 30 per cent diversion rate. A wide range of materials are collected for recycling – including paper and plastic, electronics, construction debris and food waste.
- Each university has incorporated initiatives to encourage green transportation, with 90 per cent offering public transit passes at discounted prices to students, faculty and staff, and others monitoring and reducing fuel consumption by faculty and staff vehicles.

- Water consumption is closely monitored and many initiatives targeted at reducing and reusing water are in place. Rain water harvesting, storm water management and grey water recycling practices are all employed in universities across Ontario.
- The use of chemicals on campus grounds is decreasing. Seventy per cent noted that they do not use pesticides on their grounds, which marks an improvement from 62 per cent in 2009. Fifty per cent do not use artificial fertilizers, compared with 41 per cent in 2009.
- Universities are working to reduce the environmental impacts from their supply chains. Many have ethical and environmental criteria in place for their suppliers designed to increase the number of green and socially responsible products purchased. Eighty per cent have a green cleaning program in place.

### **Teaching and Learning**

- Environmental issues are taught across Ontario's campuses in at least nine different program areas.
- Nine universities implemented new research institutes focused on environmental issues in the last year alone.
- Fourteen universities have established new partnerships with outside organizations to promote environmental sustainability in the last year.

### **Barriers and Best Practices**

Dedicated funding and continued government leadership are important investment drivers for green initiatives in universities. A number of best practices are emerging in the sector related to outreach and communications, operations and facilities management, leadership by university administrators, and stakeholder collaboration and engagement. **Eighteen awards** were received across the sector for leadership in environmental initiatives in the last year alone and many further plans are underway to continue to advance environmental sustainability at university campuses across the province.



## Introduction

Environmental sustainability is one of the most important issues of the 21<sup>st</sup> century.<sup>1</sup> It has become an urgent political concern and government policies and investments in clean energy are driving new markets and behavioural change. Postsecondary education institutions are seen as catalysts for sustainable change – through knowledge transfer, research, innovation, teaching and learning, and as key players in local communities.

Higher education bodies around the globe are committed to improving their sustainability - for example, the American College and University Presidents' Climate Commitment has 674 signatories to date<sup>2</sup>. The Sapporo Sustainability Declaration made by 27 leading educational and research institutions in the G8 countries noted that the global environmental crisis we face today is unlike any other faced by humanity – in terms of its complexity, reach and urgency – and that universities have an important role to play in problem solving to provide solutions for a sustainable future.<sup>3</sup>

Ontario's universities acknowledge the increasingly high priority for sustainability in higher education and public policy, and are committed to continuing to track and improve their green initiatives.

## Background

In November 2009, the Executive Heads of Ontario's universities pledged to demonstrate leadership in advancing a greener world. They acknowledged their commitment to improving their environmental impacts at their respective institutions, as well as to:

- Provide forums for the discussion and development of solutions regarding sustainability issues
- Share research insights and best practices regarding climate change and sustainable development
- Work in partnership with government, the public, businesses and others in the academic world, so that they may together create an environmentally sustainable Ontario

Recognizing the need for up-to-date data to benchmark and measure progress, Ontario universities have also pledged to publish an annual report documenting the efforts of the sector to modify their operations in ways that are responsive to the threats of global climate change and environmental degradation. This report marks the second annual review of these efforts, following the publication of *Ontario Universities: Going Greener* in November 2009. Its intent is not to provide a ranking of Ontario universities, but to provide a resource for government officials, university administrators, faculty, staff,

---

<sup>1</sup> Building on the 1987 definition in the Brundtland Commission Report, environmental sustainability means that the needs of the present are met with environmental standards that do not compromise the ability of future generations to meet their own needs.

<sup>2</sup> American College and University Presidents' Climate Commitment. Accessed at: <http://www.presidentsclimatecommitment.org/> on September 22, 2010.

<sup>3</sup> G8 University Summit (2008). Sapporo Sustainability Declaration. Accessed at: <http://g8u-summit.jp/english/ssd/index.html> on September 22, 2010.

students and other stakeholders interested in progress underway in the sector's efforts to going greener.

## **Policy Drivers**

Governments around the world are implementing policies to reduce their energy consumption and greenhouse gas emissions. Bill 150 was passed in Ontario in May 2009 to enact the Province's Green Energy Act to make Ontario a leading green economy. It includes measures to create green jobs, stimulate growth of renewable energy, cultivate a culture of conservation and overturn barriers to change.<sup>4</sup> The Green Energy Act opens opportunities for the transition to a green economy and Ontario's universities are working to capitalize on those opportunities and work towards common goals - through the management of their greenhouse gas (GHG) emissions and energy consumption, renewable energy generation, research dedicated to finding the technological solutions needed and teaching the skills required in this new energy future.

## **Building a Green Culture**

Strong commitment from leaders and sound data availability are key ingredients for making environmental change happen in universities. In 2007, spurred in part by the British Columbia (BC) Greenhouse Gas Reduction Targets Act, the BC Working Group on Sustainability Education conducted research to find out where the province's universities and colleges are in terms of policies, operations and research that support sustainability.<sup>5</sup> Baseline information was collected on operations management designed to reduce environmental impacts, as well as on the level of commitment to sustainability and barriers to integrating campus sustainability. The Working Group recognized that higher education institutions have an important role to play in societal change for sustainability, and that it is important to take stock of current activities in order to determine how to move forward.

The Canadian Association of University Business Officers (CAUBO) conducted a survey of sustainability leadership, management and practices in Canadian universities in 2009 to provide baseline data to be used to assess and measure institutions' approaches to leadership and management for a sustainable future.<sup>6</sup> The survey aimed to address how universities define sustainability, identify who exerts the most influence on advancing the sustainability agenda, what policy areas are formally addressed in university operations, and how universities contribute to building a sustainable future. Thirty-three universities participated in the survey, and the vast majority indicated some formal commitment to sustainability.

---

<sup>4</sup> Ministry of Energy and Infrastructure. Ontario's Green Energy Act. Accessed at: <http://www.mei.gov.on.ca/en/energy/gea/> on September 22, 2010.

<sup>5</sup> BC Working Group and Network on Sustainability Education (2007). Taking Stock 2007: The current state of sustainability in British Columbia Universities and Colleges.

<sup>6</sup> CAUBO (2009). Leading the Way to a Sustainable Future: A Survey of Sustainability Leadership, Management and Practices in Canadian Universities.

Research has shown that for environmental stewardship programs to be successful, “the institution’s leaders – the president, provost, vice presidents, and deans – must make a visible and meaningful commitment to environmental action”.<sup>7</sup> Universities in BC unanimously agreed that institutions must make sustainability central to their vision and operations to achieve change, and that meaningful policy and dedicated staff are important for institutionalizing commitment and building a “green” culture.

The following sections reflect survey responses to the 2010 Survey of Green Initiatives at Ontario Universities related to building a green culture. Green policies and budgeting practices, dedicated staff and student involvement are all components that enable improved environmental performance, and help internalize commitment to sustainability in university operations.

### **Green Policy**

Questions in this section of the survey pertain to whether or not the institution has made a formal declaration to sustainability (other than committing to the 2009 COU pledge) and the extent to which environmental initiatives are assessed and reported on across the campus.

Environmental policy statements are public declarations of university commitment to environmental protection that are used to frame decision-making and goal setting.<sup>8</sup> Eighty percent of Ontario universities have already made a formal declaration of commitment to environmental sustainability or stewardship aside from the 2009 COU pledge made by Executive Heads, and three have plans to make one. Thirteen campuses have developed sustainability or environmental policies that reach campus-wide. This finding is consistent with the 2009 survey results, where 77% of campuses had made a formal commitment to the environment. Given that the CAUBO survey found that 70% of 33 university respondents nationwide had a position or policy relative to sustainability<sup>9</sup>, Ontario’s universities are ahead of the pack.

Reporting on environmental sustainability is an important progress indicator since it helps universities move from stating commitments to acting on them. A question about whether campuses report on their green initiatives was added to the 2010 survey and responses revealed that 40% of campuses currently conduct campus-wide sustainability or environmental assessments or reports, and an additional 45% have plans to develop such studies. When asked how often the assessments or reports were produced, 12 responses were received and almost all indicated that they currently produce them annually, or plan to produce them annually.

### **Green Budget and Investment**

Many green initiatives require upfront investments to be implemented - dedicated funds can help ensure opportunities for these projects are not lost due to competition between spending priorities. To

---

<sup>7,10</sup> Creighton, S. H. (1998). *Greening the Ivory Tower*, p.17-18. Massachusetts Institute of Technology.

<sup>11</sup> CAUBO (2009). *Leading the Way to a Sustainable Future: A Survey of Sustainability Leadership, Management and Practices in Canadian Universities*, p.8.

reflect the importance of budgeting for and investing in green initiatives, a new section was added to the 2010 survey. Forty percent of respondents indicated that they either have a dedicated budget for green initiatives or plan to develop one. Those who did not have dedicated funding indicated that they finance projects in the following ways:

- On an ad-hoc basis
- Based on project proposals evaluated for merit, payback analysis and/or priority
- Student fees (ex. each student at Wilfrid Laurier's Waterloo campus pays \$5.00 per term to a green initiatives fund)
- Incorporated as part of approved overall project costs and part of general adopted approaches to project execution; e.g. green building, energy awareness /engagement initiatives

Many investments in green initiatives have the potential to reduce university costs, so it is important to track their financial impacts. It is evident that Ontario universities recognize this, based on the fact that 70% of respondents answered that they do track costs/savings from green initiatives.

### **Dedicated Staff**

Similar to the case of dedicated funding, the employment of staff responsible for implementing green initiatives can help ensure that projects are monitored and completed. Nine campuses have sustainability offices lead by staff, and 1 has a sustainability office run by students. Five universities do not have a sustainability office per se, but do have dedicated staff. Nineteen campuses have 47 full-time equivalent (FTE) staff dedicated to sustainability – an increase from the 38 reported in 2009.

The influence of the sustainability office or staff is affected by its reporting relationship with university management. For those that do have a sustainability office or dedicated staff, 71% fit within facilities (middle management) in the university hierarchy. 36% report directly to the Vice-President (VP) level and 14% are in the student union.<sup>10</sup> In some cases, dedicated staff report to the Associate Vice-Presidents, Sustainability Co-ordinators or Strategy Officers.

For campuses that do not have dedicated staff, the following explanations were given for how green initiatives are managed:

- The "Presidential Advisory Committee on the Environment" meets on a regular basis to discuss initiatives and action to be undertaken in pursuit of the University's sustainability objectives.
- Green concerns are the responsibility of Facilities Administration staff.
- Each program incorporates environmental and sustainable practices.
- They are considered to be secondary duties and approached through an "internal responsibility" approach involving those that can influence sustainability outcomes. Additionally, individuals volunteer to take on initiatives.

---

<sup>10</sup> Note: Some offices/staff may fit in middle management and also report to VP-level administrators, for example, thus making the total response percentages more than 100%.

- While green choices are encouraged university-wide, sustainability is each department’s own responsibility. Support departments such as Plant Operations, Central Stores and Procurement Services provide campus-wide services related to sustainability.

Also of importance for universities’ success in developing and implementing green initiatives is the presence of multi-stakeholder groups with representatives from across campus. Although many people in a university have environmental responsibilities, many do not see how they are related to their jobs or others on campus,<sup>11</sup> so these groups can help bridge gaps and facilitate collaborative efforts. Ninety-five percent of campuses in 2010 reported that they have a multi-stakeholder group focused on addressing green issues – a similar response to the 91% reported in 2009.

A question was added to the 2010 survey asking respondents to indicate who the multi-stakeholder group on their campus reports to. Of those that have such groups, 72% report to or advise a senior administrator, 28% report to or advise the sustainability co-ordinator, and 6% report to or advise a middle manager who is not the sustainability co-ordinator (note: two institutions that have multi-stakeholder groups did not indicate who the group reports to).

The mandates of these “green” multi-stakeholder groups vary by institution. A sample of mandates includes:

- To encourage awareness and discussion within the university community about environmental issues relevant to the university and its operations
- To co-ordinate current sustainability initiatives; promote new areas, including curriculum, where the University should take a leadership role; propose targets for energy saving and carbon reduction; and develop partnerships with organizations, universities and others to promote environmental sustainability
- To act as an advisory body and resource group with regard to policies and practices relating to the environment, sustainable development and environmental responsibility
- To develop environmental policies, account for existing initiatives, identify new opportunities, and establish a long term support and monitoring system
- To provide a forum in which members may discuss sustainability challenges and opportunities and establish pan-university approaches to sustainability initiatives
- Through a planning/prioritization process, identify and examine specific high priority issues and develop recommendations for the President to consider implementing

Of course, even where dedicated staff is present, it is important for universities to encourage the uptake of green initiatives across the campus. Ontario universities recognize this distinction and are working to ensure that silos do not develop. One university noted that although it has a Manager of Sustainability and a sustainability summer student, initiatives implemented are a result of cross-campus collaboration between staff, faculty and students, as well as many external partners. Others noted that their sustainability policy describes the responsibility as shared amongst all members of the community.

---

<sup>11</sup> Creighton, S. H. (1998). *Greening the Ivory Tower*, p.21. Massachusetts Institute of Technology.

## Student Involvement

Students can be important drivers for environmental change on university campuses through advocacy and grassroots actions. When asked in what ways students are driving sustainability on campuses, respondents had the opportunity to select more than one option – results are shown below:

	2009 (N=22)	2010 (N=20)
	# of campuses	
They are key drivers of change	46%	75%
They are an integral part of identifying sustainability goals and practices	59%	65%
They are a key partner in developing strategies and goals, but do not drive the decision-making process	46%	50%
The involvement of students and faculty in finding solutions to the institution's sustainability challenges is encouraged within specially designed educational and/or research programs	73%	80%
Students have the opportunity to contribute towards solving the institution's sustainability challenges through extracurricular activities and/or as part of their on-campus living arrangements	82%	80%

A new question was added to the 2010 survey about the types of student-led initiatives that are present on campus. Respondents had a number of options to choose from and were free to select as many that applied to them - the following answers were collected:

Student focused awareness initiatives	95%
Student-led or assisted inventories or assessments	50%
Student fee that goes towards a sustainability fund	25%
Student-led residence challenges or other behavior change initiatives	55%
Student-led retrofits or energy production on campus	10%
Multi-stakeholder collaboration	75%
Staff-faculty focused programs that are led by students	15%

Students are engaged at Ontario's university campuses in a wide range of initiatives. Survey respondents were asked to provide further details on how they are including students in green initiatives, and the following list presents a sample of the submissions received:

- Planting trees on the campus property as partially offsetting carbon produced to support the operation of the campus
- Students have taken part in the development of an 'Ecovillage' where two of the existing townhouse residence have been retrofitted to measure energy consumption with newly installed energy efficient devices
- Curriculum and Think Tank programs focused on sustainable design
- The Sustainability office has partnered with students to provide awareness campaigns regarding E-waste and to assist with the collection of student E-waste

- Housing Services has partnered with the Office of Campus Sustainability to create a Green Reps program in the Residences; these Green Reps are responsible for hosting workshops and running the composting program
- The promotion of sustainable actions and lifestyles on campus through targeted campaigns in residences; one program allows students to take on a leadership role by becoming a rep on their floor, helping organize and run events, putting up promotional materials and modeling environmental behaviour to promote practical, peer-to-peer learning about environmental issues
- The Sustainability office is part of the Orientation activities on campus in September, which allows incoming students the opportunity to get an immediate introduction to sustainability on campus; the office provides financial support for sustainable student orientation initiatives and is present at some of the activities to provide outreach and engagement opportunities
- Net Impact student club, developing a website for sustainable commerce and involvement with Impact! - The Co-operators Youth Conference for Sustainability Leadership
- An energy challenge in undergraduate residences called Res Race to Zero, and the creation of Residential Environmental Ambassadors (REA's); the challenge in each Residence, and for each student, is to lower their energy consumption for the month of March, beating the levels set in the previous March

## **Reducing Environmental Impacts**

University campuses can have substantial environmental impacts based on their energy consumption and related emissions, water consumption, waste production, land use practices and purchasing decisions. Section 6 of Ontario's Green Energy Act could require universities to submit energy conservation plans, which would include strategies for reducing energy consumption. Many campuses already track their energy and water usage, and are employing methods to lower consumption and improve their environmental impacts.

### **Emissions and Energy Use**

#### **Emissions**

Carbon dioxide (CO<sub>2</sub>) emissions, and energy use from campus buildings and operations, are perhaps the most significant environmental impacts created by universities.<sup>12</sup> Governments around the world are implementing policies to curb GHG emissions – Ontario's Action Plan on Climate Change includes emissions reductions targets of 6% below 1990 levels by 2014, 15% by 2020 and 80% by 2050.<sup>13</sup>

Emissions inventories are complex and time-consuming to compile, yet 85% of the Ontario campuses that participated in the 2010 Survey of Green Initiatives have completed an inventory of their GHG or

<sup>12</sup> Creighton, S. H. (1998). Greening the Ivory Tower, p.63. Massachusetts Institute of Technology.

<sup>13</sup> Government of Ontario (2007). Ontario's Action Plan on Climate Change. Accessed at: <http://www.ene.gov.on.ca/publications/6445e.pdf> on September 23, 2010.

CO<sub>2</sub> emissions, or have plans to complete one (compared to 73% in 2009). Those who have already compiled inventories were asked to note their current emissions levels and responses ranged from 5,222 tonnes per year (equivalent to 949 typical passenger vehicles<sup>14</sup> or 326 homes with 4 inhabitants<sup>15</sup>) of CO<sub>2</sub>e (carbon dioxide equivalents) to 164,491 CO<sub>2</sub>e per year (equivalent to 29,907 typical passenger vehicles or 10,281 homes with 4 inhabitants). Ten percent of respondents regularly set and review targets for emissions reductions and 45% have plans to develop such targets.

To gain an understanding of what is covered in universities' emissions inventories, COU asked whether the following items were inventoried in 2009 and 2010. Nine campuses responded to the question each year, since that is how many indicated that they currently have a GHG inventory. Based on the table below, the scope of the inventories has increased year over year.

	2009 (N=9)	2010 (N=11)
Scope 1: Fertilizer	n/a	4
Scope 1: Natural gas combustion (on campus)	9	11
Scope 1: Fleet	8	10
Scope 2: Purchased electricity, steam, heat or cooling energy	7	11
Scope 3: Waste disposal	2	5
Scope 3: Procurement (embodies energy)	0	1
Scope 3: Commuting	4	5
Scope 3: Business travel	0	2
Scope 3: Other	0	2

## Energy

In 2010, campuses were asked whether they measure their energy use (separately from their GHG emissions) and 85% reported that they do. Those that measure energy do so by collecting data from building energy meters, or by reviewing their utility bills. Several campuses also compile energy data at the same time as emissions data and use conversion factors from Statistics Canada.

Centralized energy control systems and building meters help to facilitate data collection and energy use monitoring. Fifty-five percent reported that they have a centralized building control system for all buildings and 30% for some buildings. Twenty-five percent of these campuses have individual energy meters in place for all buildings on campus and 65% have meters installed in at least some of their buildings. A new question was added to the 2010 survey to gain information on the coverage of individual metering. Responses indicated that energy meter coverage ranges from 15 to 100% of total

<sup>14</sup> US EPA. Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle (1 vehicle = 5.5 metric tons of CO<sub>2</sub>e). Accessed at: <http://www.epa.gov/oms/climate/420f05004.htm> on October 4, 2010.

<sup>15</sup> US EPA. Climate Change – Greenhouse Gas Emissions – In the Home (4 metric tons CO<sub>2</sub>e per person, per year). Accessed at: [http://www.epa.gov/climatechange/emissions/ind\\_home.html](http://www.epa.gov/climatechange/emissions/ind_home.html) on October 4, 2010.



buildings - 12 out of 15 respondents indicated that more than 75% of their buildings have meters installed.

District energy systems allow for increased efficiency of energy use by centralizing the production of heating/cooling for a campus. Cogeneration (combined heat and power) is a form of energy recycling that generates electricity and heat, while tri-generation incorporates the use of water and steam for heating and cooling. Eighteen campuses employ district energy systems; 42% employ cogeneration systems and 5% employ tri-generation systems.

Universities have the potential to reduce their carbon emissions and lower their energy bills over time by producing their own, on-site renewable energy. Twelve campuses indicated that they currently produce on-site renewable energy and eight have plans to begin producing it. Solar electric (photovoltaic) power is the most commonly generated – 75% of respondents indicated they produce this form of electricity, as compared to 60% in 2009. Geothermal energy is the next most commonly produced (25%), followed by solar thermal (19%). Twenty percent of campuses are also choosing to purchase renewable energy or renewable energy credits from off-campus renewable sources – an increase from the 9.5% that purchased such credits in 2009. Ten percent of respondents have taken advantage of the Ontario government’s feed-in tariff program that was introduced as part of the Green Energy Act, and a further 70% have plans to.

The following table indicates the percentage of renewable energy of the total energy used on campuses. Based on these responses, Ontario’s campuses are clearly increasing the amount of renewable energy that they are using, which will lower their GHG emissions and help improve air quality.

	2009 (N=21)	2010 (N=19)
0%	67%	35%
1-10%	24%	50%
11-20%	0%	5%
31-40%	5%	5%
Unknown	5%	5%

## Green Buildings

Green, energy efficient buildings can result in significant savings for universities, in terms of energy and water use in particular. Green buildings also tend to have indirect benefits, such as improved air quality, pollution prevention, waste reduction and better lighting, and have even been linked to higher productivity, reduced employee turnover and better well-being.<sup>16</sup> Many of Ontario’s universities have incorporated “green” elements into new construction, as well as in retrofits of existing buildings. Forty-five percent have implemented green standards in buildings campus-wide, while 40% have incorporated them in some buildings. The most commonly referenced standard used by Ontario’s universities is the Canada Green Building Council’s Leadership in Energy and Environmental Design (LEED) – 14 out of 17

<sup>16</sup> Heerwagen, J.H. (2000). Green Buildings, Organizational Success, and Occupant Productivity. *Building Research and Information Vol. 28 (5), 2000:353-367.*

respondents indicate that they use this standard. Other standards noted include the Green Globes Building Assessment System, internally developed standards based on the Toronto Green Standard, American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards, and the Building Research Establishment Environmental Assessment Method (BREEAM).

Fifty-five percent of campuses responded that they have implemented a sustainable roofing standard on at least some of their buildings (as compared to 41% in 2009). Eighty percent have installed green or cool roofs on at least some of their buildings – an increase from the 64% that indicated they had installed green roofs in 2009. A new question was added in 2010 about whether campuses measure their indoor air quality, and 75% indicated that they do on at least part of their campus.

Technology upgrades can help to reduce energy consumption in new and existing buildings. The following tables illustrate the energy-saving technologies that Ontario’s universities are using in terms of information technology (IT), heating, ventilation and air conditioning (HVAC), and lighting.

<b>IT Initiatives Implemented</b>	<b>2009 (N=20)</b>	<b>2010 (N=20)</b>
Virtualization of servers	85%	85%
Teleworking	40%	50%
Educational awareness	65%	65%
Digital imaging	70%	70%
Enhanced videoconferencing	75%	70%
Remote management of CPUs	65%	65%
Efficient servers	70%	85%
Energy Star labelled equipment	80%	75%
Flash memory storage of data	30%	35%
Data center heat recovery	15%	15%
Decommissioning inefficient building controls	n/a	40 %
Other	25%	40%

The implementation of efficient servers and flash memory data storage have had the most significant increases on campuses in 2010. Examples of “other” IT initiatives that have been implemented include software to automatically shut down computers at night, electronic submission of papers and exams, double-sided printing, and centralized servers.

<b>HVAC Initiatives Implemented</b>	<b>2009 (N=22)</b>	<b>2010 (N=20)</b>
Thermal insulation of buildings	68%	65%
Downsizing of fans and pumps	55%	55%
CO2 sensors	82%	85%
Variable air-volume ventilation	100%	100%
Air-side economizers	55%	75%
Direct digital controls	91%	100%
Thermostat setbacks	86%	85%
Window film	n/a	55%
Variable speed drive	n/a	95%
Other	41%	35%

Examples of “other” HVAC initiatives that have been implemented include deep lake cooling, absorption chillers, thermal mass storage, a low-temperature condensate system for heat sink, condensing economizers on main boilers and water-to-water heat pumps.

<b>Lighting Initiatives Implemented</b>	<b>2009 (N=22)</b>	<b>2010 (N=20)</b>
CFLs	86%	90%
Fluorescent tube upgrades (e.g. from T12 to T8)	96%	95%
T5s	68%	65%
Occupancy sensors	96%	90%
Networked lighting	41%	50%
Auto-dimming lighting (with daylight sensors)	46%	50%
Behaviour change campaigns	82%	60%
LED exit signs	27%	95%
LED emergency lighting	59%	50%
Outdoor lighting efficiency	41%	80%
Other	27%	20%

Examples of “other” lighting initiatives that have been implemented include the Ontario Power Authority’s Demand Response 3 program, conversion of roadway lighting to induction and participation in Earth Hour. Four campuses have banned the use of incandescent lights.

### **Green Transportation**

Emissions from university-owned vehicles, and staff and student commuting/travel, contribute indirectly to the emissions profiles of campuses. A new question was added in 2010 pertaining to fuel use monitoring and targets. In terms of campus fleet vehicles, 9 campuses monitor fuel use and set fuel reduction targets (this may include decommissioning low-efficiency vehicles). Eleven out of 17 campuses use alternative fuels in at least some campus vehicles – one campus uses alternative fuels in 93% of its fleet, and one has 77% electric vehicles.

A number of initiatives have been implemented on Ontario’s university campuses to curb transportation-related emissions. The following table outlines a number of these initiatives:

<b>Transportation Initiatives Implemented</b>	<b>2009 (N=22)</b>	<b>2010 (N=20)</b>
Free or discounted bus or public transit passes to students	86%	90%
Free or discounted bus or public transit passes to faculty and staff	41%	55%
A carpooling or vanpooling program	67%	65%
A bike or car sharing program	50%	50%
Adequate and protected bicycle racks	91%	95%
Bicycle lanes	50%	60%
Preferred parking for high efficiency vehicles	15%	25%
Options for staff teleworking	n/a	30%

When asked to describe key initiatives in the area of transportation and fleet management aimed at promoting environmental sustainability that were implemented in the last year, responses included (but were not limited to) the following:

- Employee participation in commuter challenges
- Addition of new bike racks and programs to increase the “bike-friendliness” of campuses (ex. bicycle repair workshops, safe bike parking, bike share programs)
- Improved access to public transit (through discounted transit passes and increased bus routes)
- Increased numbers of electric vehicles
- Transportation Demand Management Plan that emphasizes alternatives to automobile transportation and calls for replacing automobile infrastructure with pedestrian, bicycle and transit infrastructure; traffic and parking enforcement is done by foot, bicycle or using fuel-efficient vehicles
- An on-campus transportation hub for city and inter-city bus travel with connection to the airport
- A Green Vehicle Purchasing Policy that commits the university to explore environmentally friendly options in the operation, maintenance and purchasing of vehicles
- A recommendation from the President's Sustainability Council to establish policies and practices to reduce emissions of greenhouse gases and other pollutants from vehicles, for example through establishment and enforcement of a "no idling" policy for all vehicles on campus

## **Waste Management**

Waste management strategies are important for reducing environmental impacts. Facilities managers and environmental health and safety officers have vested interests in seeing that universities generate as little waste as possible to minimize disposal fees and minimize safety problems and regulatory violations. Seventy-nine percent of respondents have behaviour modification programs on campus targeted at reducing material usage. Ninety-five percent of campuses surveyed conduct waste composition studies or audits, and 42% currently set and review targets for reducing waste (16% have plans to develop waste reduction targets). Those who conduct waste composition studies or audits described how they do so. A number use reports from hauling companies or weighbills from processing stations, some hire waste consultants to conduct audits based on waste generated in a specific time period, and others do their own visual audits.

All 20 campuses indicated that they have some form of materials surplus, exchange or recovery program to divert items such as computers, furniture, office supplies or lab equipment from landfills. Waste diversion rates submitted ranged from 31-80% - an improvement over 2009 levels, where 4 of 22 respondents submitted diversion rates below 31%.

A number of waste materials are collected on campuses for recycling or specific disposal processes. The following table outlines some of these materials and the percentage of campuses that have measures in place to dispose of them. Responses collected in 2009 were consistent with those in 2010.

Items Collected for Recycling or Appropriate Disposal	2010 (N=20)
Paper and cardboard	100%
Aluminum	90%
Glass	95%
Plastic	100%
Organic waste (compost)	70%
Construction and demolition waste	70%
Non-construction scrap wood	70%
Non-construction metal	85%
Electronics	85%
Batteries	95%
Polystyrene	35%
Fluorescent tubes and CFL light bulbs	75%
Motor oils	55%
Grease and frying oils	70%

Ontario's universities are working to continuously improve their recycling and waste management practices. Ninety percent of campuses surveyed have programs linked to hospitality services that encourage students and employees to bring their own food and beverage containers. A number of other innovative programs aimed at waste reduction were implemented at Ontario's university campuses in the past year. Some of these include:

- Purchasing bins to be used for collecting organics and recycling for special events; in one case an event was held where 1600 participants produced only 1 bag of waste
- E-waste recycling initiatives
- Developing collaborative RFPs where sustainability has a high priority in the evaluation criteria; in one case for a paper contract, the change resulted in 3,100 fewer truck deliveries to campus, \$460,000 in monetary savings and the elimination of 10,000 cardboard boxes entering the waste stream
- Inventories to determine where waste and recycling bins are needed
- Vermicomposting programs, which use worms to decompose organic matter in a fast, odorless manner

## Water Management

Water conservation can have both financial and environmental benefits for universities. Reducing the amount of water used (and recycling it where possible) can lower the need to treat wastewater, as well as the amount of energy needed to heat water. In order to track changes in water consumption, it needs to be monitored across the campus – new questions were added to the 2010 survey to gain insight on how water is being monitored at Ontario's universities. Eighty-five percent of Ontario's universities are currently monitoring their water consumption on at least part of their campus, and 5% have plans to start. Ninety percent have water meters on at least some of their buildings and, of these, the meter

coverage ranges from 20% to 100%. All but 4 campuses of the 17 that responded have water meter coverage greater than 75%.

A number of water efficiency upgrades have been installed on university campuses in Ontario, including the following:

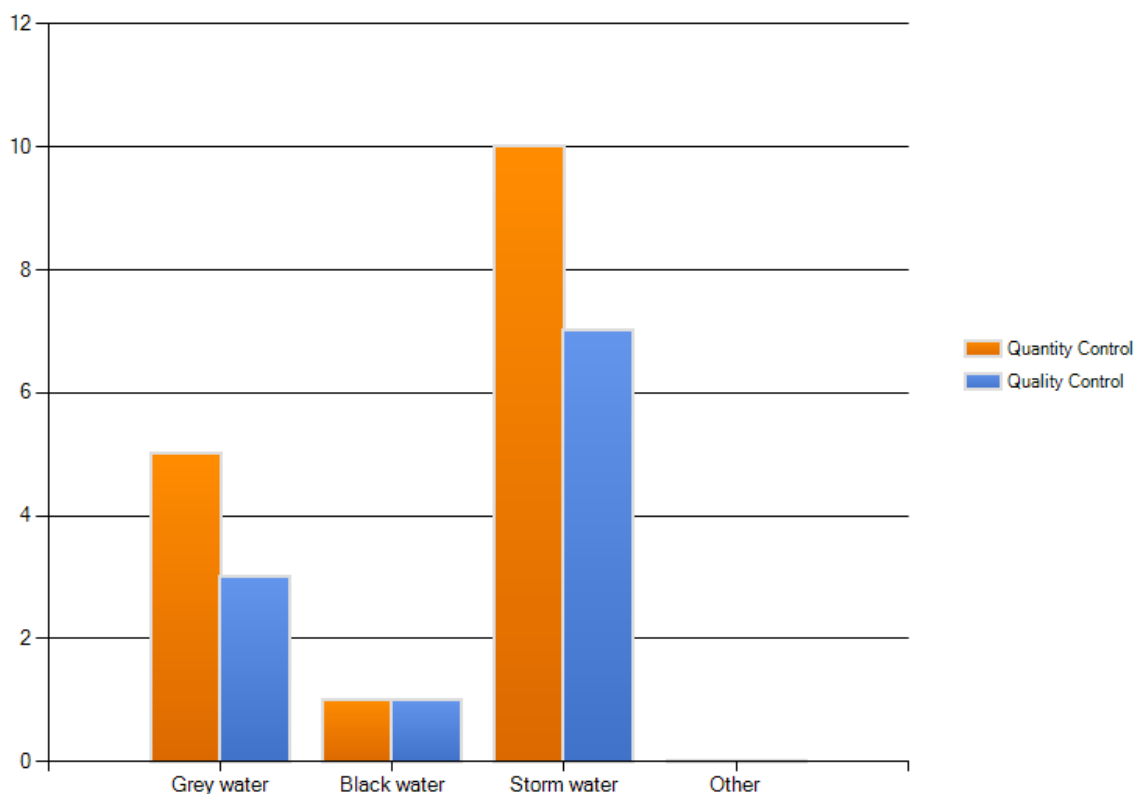
<b>Water Efficiency Upgrades Implemented</b>	<b>2009 (N=21)</b>	<b>2010 (N=19)</b>
Low flow toilets	95%	90%
Low flow shower heads	81%	84%
Low flow faucets	76%	90%
Recirculating fountains	33%	37%
Chilled water	52%	63%
Conversion of water - cooled equipment to air cooled	n/a	37%
Other	52%	37%

Other water management initiatives employed include waterless urinals, grey water for irrigation and toilets, non-potable water usage, cooling tower controllers, high-efficiency water pre-treatment (softeners/demineralizers), water recirculation systems, automated boiler blowdown, rainwater irrigation, cooling tower water softening, steam trap audit, new laundry technologies and drinking fountain inventories.

The following chart shows responses from campuses when asked about reuse strategies used to control water quantity and quality. Twelve campuses responded to the question. It was noted that some also have strategies to control the quantity of ground water used, and others harvest rain water to use in their operations.

The chart indicates that reuse strategies for grey water and storm water have been implemented most frequently, and that currently efforts tend to be more focused on reuse strategies for managing water quantity rather than quality.

Please indicate for which of the following water sources your campus has implemented reuse strategies to control water quantity used and/or quality:



A number of rain and storm water management techniques have also been applied on university campuses to prevent flooding and manage runoff water. The following table illustrates a number of the techniques used – answers were consistent with 2009 responses.

Rain/ storm Water Techniques	2010 (N=16)
Bioswales	69%
Detention ponds	63%
Cisterns	56%
Permeable paving	38%
Rain gardens	25%
Down spout conversion away from storm drainage	31%
Other	38%

Other initiatives cited include green roofs/rain water harvesting on roofs, a storm water retention drain or pond and the installation of a combined sewer overflow tank.

### Nature Conservation

Many of Ontario’s campuses occupy significant areas of land – campus sizes of those that responded to the 2010 survey range from 1.3 to 591 hectares (53% of campuses are greater than 100 hectares).

Seventy-five percent of campuses have protected natural areas. As a result, universities have environmental impacts based on their use of pesticides and fertilizers on these grounds, effects on wildlife habitats, and how they care for lawns, fields and trees.

Sixty percent of campuses indicated that they had implemented habitat restoration programs (consistent with 2009), and 70% noted that they do not use pesticides on their grounds (up from 62% in 2009). Fifty percent do not use artificial fertilizers (compared with 41% in 2009) – 40% use them only in some campus units.

## Green Procurement

Universities purchase many goods, such as office supplies, computers and IT equipment, furniture, food, cleaning supplies, etc. Through the incorporation of sustainability in their supply chain management strategies, they can reduce the environmental impacts of goods purchased and indirectly improve campus sustainability.

A number of procurement programs have been implemented across Ontario’s university campuses that are aimed at reducing environmental impacts. Seventy-nine percent of respondents indicated that they have a program to reduce the consumption of bottled water, or have plans to develop one. Seventy-nine percent have a green cleaning program in at least some parts of their campus – of those that do, 44% require third-party verification of all the green cleaning products and an additional 31% do for at least some of the products. 47% of the survey respondents have a road salt reduction policy or follow the Ministry of Environment guidelines road salt use, salt storage and reduction.

Purchasing criteria have been used as a way to guide sustainable buying decisions – the following table outlines some of these criteria:

<b>Purchasing Criteria</b>	<b>2009 (N=19)</b>	<b>2010 (N=13)</b>
Contain recycled content	84%	79%
Be energy efficient	90%	90%
Come from sustainably managed sources	37%	32%
Come from local sources	26%	32%
Be fair trade	61%	47%
Be sweat-shop free	83%	68%
Contain no toxic materials	39%	37%
Other	37%	37%

Other types of purchasing criteria used by universities that are not covered in the table include the use of EPEAT standards for green electricity and hybrid technologies for vehicles. Some campuses have implemented green purchasing policies campus-wide that were approved by the university Board.

The purchase of local, sustainable food can help to ensure that healthy food options are available on campus, and also reduce the indirect emissions associated with transporting food across long distances. A number of sustainable food options are available on Ontario’s campuses, as shown in the table below.



Consistent numbers were reported in 2009 and 2010, except in the case of locally sourced food, which went from 71% in 2009 to 85% in 2010.

<b>Sustainable Food Options</b>	<b>2010 (N=18)</b>
Vegetarian	95%
Vegan	85%
Fair trade	80%
Locally sourced	85%
Other	30%

Organic, Kosher and Halal food options are also available on some campuses, as well as pasture-fed beef and hormone-free meats. At least two campuses have farmers’ markets on site, and some have incorporated programs where volunteers cook sustainable food options to provide them to students and staff at affordable prices. The following are further examples of innovative ways that campuses have improved the sustainability of their purchasing decisions in the past year:

- In one university, a team comprised of representatives from Purchasing Resources, Media Production Services, Facility Services, the Office of Sustainability and the Certificate for Advanced Leadership and Management (CALM) worked in collaboration on a sustainable RFP to eliminate shipments of cardboard boxes replaced by reusable totes to campus by our office supply and paper vendors. Shipping orders were also consolidated from five-days to one-day per week. A \$2.3 million savings was achieved over the five-year life of the office supply and paper contract contracts combined.
- The university’s procurement department is working with an IT group to establish environmental standards.
- One institution was certified by Local Food Plus (LFP), a non-profit organization that connects local and sustainable farmers with institutions.
- Hospitality Services has a groundbreaking Local Sustainability Plan that promotes environmentally friendly practices and programs in all food service locations, as well as a commitment to buying local, seasonal Ontario products as much as possible (targeting at least 40%). Local food purchases include fresh produce, dairy products, eggs, yogurt, ice cream and a variety of meats. Food choices on campus include vegetarian, vegan and fair-trade options.
- One university has a Centre to teach local organic food production and resource conservation through practical experiential learning. Hospitality Services purchases food from this garden when available.

## **Teaching and Learning**

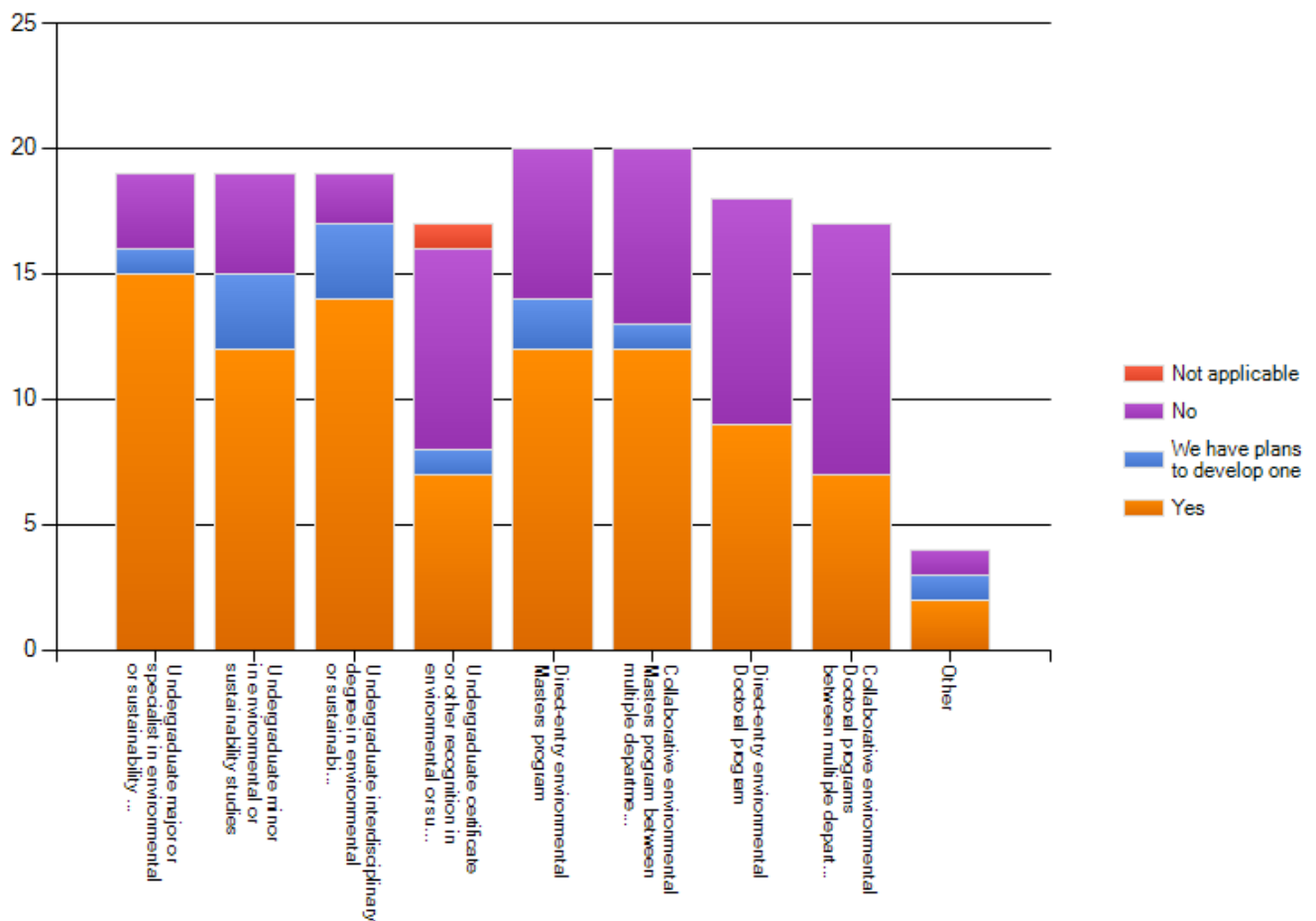
### **Green Courses and Programs**

Universities are key contributors to building a green economy – not only through their own operations, but through research, innovation and curriculum content. Ontario’s universities work with local

government, businesses and other community organizations to ensure that collaborative solutions to environmental problems are explored. They are finding ways to integrate sustainability into their courses and programs, and setting up research centres to explore and share ideas.

The following chart outlines how respondents have integrated environmental/sustainability studies into their program offerings. Seventy-nine percent have an undergraduate major or specialist in environmental or sustainability studies and 60% have direct-entry environmental Masters' programs; both of these results are consistent with the 2009 responses. In 2010, 50% of respondents reported having direct-entry environmental PhDs, which represents an increase from the 35% reported in 2009. This increase in environmental PhD program offerings will result in a higher number of advanced researchers across the province. A number of universities indicated that they are planning to further expand their program offerings in the field of environmental/sustainability studies.

**Does your campus offer any of the following:**



Due to the fact that environmental sustainability is a cross-disciplinary issue that affects many study areas, it is important that courses addressing related issues be offered across campuses. In 2010, campus respondents were asked to indicate whether departments in various study areas offer courses on environmental issues. The following table indicates that many of Ontario’s universities offer courses in multiple faculties – especially at the undergraduate level.

Subject Area	N=19	
	Undergraduate	Graduate
Natural Sciences	56%	6%
Physical Sciences	64%	7%
Health Sciences	82%	
Social Sciences	69%	13%
Humanities	91%	9%
Engineering	54%	15%
Architecture and Design	43%	
Business	69%	8%
Teacher Education	79%	11%

A number of examples were cited by respondents for how sustainability concepts are continuing to be implemented into their curricula and program/degree offerings. The following examples were implemented since 2009:

- 2009 was the inaugural year for a Master’s in Sustainability at Trent.
- The Sustainability Office held a "Sustainability in Academics: Lunch Forum" where the deans of Wilfrid Laurier University were invited to discuss the possibilities of integrating sustainability into the curriculum. The Academic Plan 2010-2015 discusses, in detail, sustainability, environment, diversity, justice, social and cultural analysis, and cultural and artistic production.
- Ryerson has a Comprehensive Certificate in Sustainability offered through Continuing Education.
- OCADU offers a number of courses encompassing sustainability issues in its design and liberal studies faculties, including Habitat and Housing – new green typologies, Pre-Fabrication Systems, Sustainable Materials, Biomimetic Materials & Applications, Socially Responsible Design, Sustainable Design & Development, Cities for People, Living Environmental Design, Biological Principles of Sustainability, Nature, Culture & Society, and Consumerist Issues.
- McMaster’s Sustainability Internship program encourages students to apply the knowledge of sustainability gained through their coursework in a real-world setting; as projects through the internship program are related to a project or theme within their coursework, their efforts contribute to academic credit.
- McMaster’s Faculty of Engineering’s Strategic Plan, entitled “Engineering a Sustainable Society”, outlines the faculty’s vision and plan for becoming internationally known “as a leader in research and education supporting the development of engineering practices for a sustainable world”; the new Engineering Technology Building has been outfitted with an Elliptical Lab that offers students firsthand experience working with sustainable computing systems.

- Waterloo's new School of Environment, Enterprise and Development (SEED) was launched in the Faculty of Environment. The School is one-of-a-kind in North America and is one of the most comprehensive in the world. Its aim is to offer a fully integrated environment and business curriculum. The Master's of Environment and Business (MEB) was also recently launched under SEED, and is an alternative to a traditional MBA. SEED's Sustainable Practice Program is a new non-degree training program for mid to senior management in the industry, capital markets, government and NGOs. Courses focus on "sustainable development," also known as Corporate Social Responsibility (CSR) and the Triple Bottom Line (TBL). A new PhD program was established in Environment and Resource Studies. Areas of focus are: "Resource Analysis and Stewardship," "Socio-Ecosystem Function and Renewal," and "Sustainability Policy and Governance."
- Queen's has a new Applied Sustainability Master's Program, where students will work towards a Master's of Science or Engineering in chemical, civil, geological, mechanical and materials, electrical and computer or mining engineering with a designation in applied sustainability. The program's goal will be to expose students to the implementation of sustainable engineering solutions within the broad context of sustainability theory. As such, every student in the program will be required to take two core courses in sustainability issues, with the rest catering to their area of specialization - everything from energy technology and fresh water systems, to resource management and policy studies.
- Western's Centre for Environment and Sustainability offers a compulsory graduate course called Foundations in Sustainability, jointly offered to Master's in Environment and Sustainability students and to graduate students registered in the Collaborative Graduate Program. The Faculty of Engineering has initiated a new program entitled Green Process Engineering, which is the first of its kind in Canada.
- The University of Ottawa's strategic 10-year plan outlines the creation of new course and degrees in social and environmental sustainability. In 2009, over 100 students were involved in sustainability-related Experiential Learning opportunities.
- The University of Toronto's Centre for the Environment has a number of undergraduate courses focusing on environmental topics, such as urban sustainability, efficient uses of energy and carbon-free energy. Graduate courses focus on urban sustainability and ecological technology, as well as cities, industry and environment.
- In the past year, Toronto's Environmental Engineering Collaborative Program for Civil and Chemical undergraduate students evolved into a minor in Environmental Engineering. A new minor was also created in Sustainable Energy and an Energy Systems option was added to the Engineering Science program. Many of the courses within this program deal with the issues of responsible energy use and alternative and renewable energy systems. Academic program changes at the Department of Civil Engineering have resulted in a number of new core courses relating to sustainable development.
- Toronto's new Centre for Global Engineering has hosted a number of seminars on sustainable development topics and has been involved in the creation of a new course, Technology, Engineering and Global Development, which is being offered for the first time this year.

- Windsor hosted an Environmental Forum that focused on ways to integrate sustainability into curriculum. A number of interdisciplinary programs are presently being discussed.
- The curriculum of Guelph's Mechanical Engineering major is designed around a frame of sustainability and includes a stream in wind and solar energy. New fourth year Engineering courses, available in all majors of the Engineering program, focus on sustainability of design. Two new Graduate Diplomas in Engineering with a focus on sustainability were also introduced: Engineering Design of Sustainable Water Resource Systems and Modelling Applications in Water Resource Engineering.
- An Environmental Governance major in the Bachelor of Arts program at Guelph is an interdisciplinary program that embeds sustainability and stewardship in the curriculum through courses in agricultural economics, political science and geography.
- An Agriculture and Environmental Stewardship course in the Environmental Management major at Guelph (Bachelor of Bio-Resource Management degree program) examines the impact and role of farming in the agro-ecosystem.
- York's President's Sustainability Council submitted its first report in April 2010. It contains a framework for moving forward with a university sustainability strategy focused in a number of key areas.

## **Environmental Research**

Fifty percent of the survey respondents have added research institutes since 2009 that specifically focus on environmental issues. Listed institutes include:

- The Carleton Sustainable Energy Research Centre (CSERC)
- The McMaster Centre for Climate Change
- Waterloo's Interdisciplinary Center on Climate Change (IC3)
- Western's WindEEE Dome, Advanced Facility for Avian Research (AFAR)
- UOIT's Clean Energy Research Laboratory and Nuclear Science & Energy Research Building
- Fudan-Queen's Sino-Canadian Centre for Environment and Sustainability Research
- Water Research Group at Queen's
- Toronto's Centre for Sustainable Energy
- Guelph's Centre for Public Health and Zoonoses

Several other research institutes are currently in development and are expected to be launched in the near future. Such groups are important contributors to environmental research due to their interdisciplinary and collaborative nature.

## **Green Partnerships**

Seventy percent of campus respondents indicated that they have established partnerships in the past year with businesses, local organizations or governments to promote sustainability. The following points outline just some examples of how Ontario's campuses are working with outside organizations in collaborative green partnerships:

- Toronto-Scarborough has partnered with Evergreen since 2006 on its *Green the Campus* campaign. Via this campaign, a lot of tree, shrub and wildflower planting is done on campus, along with educational events and vegetable gardening.
- Wilfrid Laurier joined Sustainable Waterloo's Regional Carbon Initiative, which facilitates voluntary target-setting and reductions of carbon emissions in organizations across the Waterloo Region.
- Ryerson's Computing and Communications Services department has partnered with Toronto Hydro on its Data Centre Incentive Program (DCIP) for data centres.
- OCADU and Zerofootprint are planning to collaborate on ZERO Lab, a visualization and mobile computing environment dedicated to developing new applications, tools, visualizations and methodologies in order to reduce human impact on the environment by reducing our carbon footprint.
- McMaster University is working with Horizon Utilities to reduce its utility consumption and determine funding and resource opportunities. McMaster has also partnered with Horizon for a major solar initiative under the Province of Ontario's F.I.T Program which will be funded for a 250 Kw solar system on several roofs on campus and is expected to be completed next summer.
- Conrad Grebel University College has recently partnered with the Region of Waterloo to test out a green bin program extension to the institution.
- Queen's University has become an official community partner of the Sustainable Kingston Community Plan.
- Windsor has partnered with Enwin in an energy reduction program and on May 6, 2010 the university received the Enwin GreenSTAR Award for conserving 1.4 million kilowatt hours of electricity per year—the equivalent of about 110 average households.
- Toronto-Mississauga has partnered with EcoSource to set up and evaluate an urban agriculture plot on and off campus.
- Guelph has developed a Sustainable Urban Agriculture Certificate, in partnership with the Office of Open Learning, The Royal Botanical Gardens, Plant Agriculture Kemptville Campus and the Ontario Agricultural College.
- York University is one of the founding members of Smart Commute – North Toronto, Vaughan, which collaborates with its many partners to: implement trip reduction programs; decrease traffic congestion, and improve air quality and health; improve local infrastructure and transit accessibility by advocating for sustainable transportation; encourage transit-supportive development and province-wide smart-growth strategies; increase opportunities for Transportation Management Associations collaboration with businesses, NGOs, institutions and governments.

## Barriers and Best Practices

The final section of the 2010 Survey of Green Initiatives at Ontario Universities allowed respondents to identify any other green initiatives that were not covered in previous sections of the survey, as well as awards or recognitions received in the past year. Information was also collected about key barriers facing the integration of sustainability on campuses, best practices that have facilitated implementation of sustainability and future plans to incorporate green initiatives.

In terms of barriers to sustainability, funding constraints were listed by multiple institutions. In some cases, the level of priority placed on sustainability could be raised, so that it is considered more than a compliance issue. Co-ordinating efforts across campus was also seen as a challenge, since the issues are far-reaching and involve multiple campus units. Effective communications with consistent messaging can also be difficult, since the issues are complex and there are various levels of engagement across campuses.

Despite these barriers, many stories of best practices in implementing green initiatives are emerging from Ontario's campuses. Four reoccurring themes emerged as important for advancing sustainability in Ontario's universities – these are outlined in the table below:

<p><b>Outreach and communications (student and faculty engagement)</b></p>	<p>For outreach, the most important thing is to engage faculty and students and provide them with a sense of ownership of the issue. In order for there to be institutional change, it really needs to be an expression of mass interest on the part of the students and faculty. Encouraging the formation of groups, especially via any student unions that may exist, is the most direct way to do this.</p> <p>The collaboration of faculty, staff and students on campus-wide sustainability initiatives is a key component in the creation of culture of sustainability, and produces exponential results.</p> <p>The large size and complex structure of the university is a barrier. It means that there are many decision makers who need to be consulted and involved before new initiatives can be launched or new directions taken. This takes time, yet students are generally here for a relatively short time.</p>
<p><b>Operations and facilities management</b></p>	<p>On the operations side, starting with cost savings is always the easiest. Water and electricity related initiatives typically have the quickest payback. Small percentage gains on big expenditures (like</p>

	space heating) also tend to be great cost-efficient ways to make significant improvements to environmental performance.
<b>Leadership</b>	Having champions in high-ranking positions helps many types of initiatives get implemented.
<b>Engagement and collaboration with stakeholders</b>	In light of funding concerns, building partnerships and collaboration among several entities is valuable. This approach not only achieves a wider initial buy-in, but also helps to distribute costs among several groups or operating units, making resources asks and commitments more manageable.

Building on best practices, universities were asked to note if they had received any awards/recognition in relation to their environmental sustainability practices in the last year. Eighteen awards were received:

- Ryerson won the Gold Ontario Waste Minimizaton Award from the Recycling Council of Ontario in recognition of excellence and commitment to a sustainable environment
- The American Institute of Architects Honor Award for Regional and Urban Design was given to the Ryerson Master Plan for excellence in regional and urban design; the Master Plan emphasizes intensification of development to minimize the University's footprint in downtown Toronto
- OCADU has received the Bicycle Friendly Business Award from the City of Toronto and held a student competition for designing new bike racks.
- The OCADU "Foodprints" initiative achieved a design excellence award at Canada Blooms 2010, and was also a finalist in the Evergreen Brickworks award for sustainable design
- McMaster won the 2009 Smart Commute Employer of the Year and was the 2010 Clean Air Commute Winner
- McMaster's work on sustainable procurement for office supplies and paper made it the winner of CAUBO's Quality & Productivity Regional Award and the McMaster University President's Award
- McMaster received LEED Silver certification for the Burke Science Building project
- Waterloo's School of Environment, Enterprise and Development (SEED) has been ranked number 1 by the Corporate Knights magazine for the 3rd time in terms of how well the universities are doing to integrate sustainability into learning experience; the School scored 92.7%
- Yan Yu, a Queen's student, received the Top 20 under 20 Award from Youth in Motion for his innovation and achievement in advancing sustainability at Queen's; Yan also started Queen's Students against Wasting Food (QSAWF), a group dedicated to reducing dining hall food waste



- Jane Bowles, Adjunct Professor in Biology and Geography at Western was recognized with the Green Umbrella Award for being incredibly active in countless ecological conservation efforts in the region for well over 25 years
- Western’s Claudette MacKay-Lassonde Pavilion was given the Green Brick Award for incorporating dozens of demonstration and functional sustainability design features
- LEED Certification was awarded for the Convergence Centre at the Western Research Park
- The University of Ottawa was recognized by the Regroupement de Gent d’Affaire for its sustainability initiatives
- The University of Toronto received one of the Awards of Excellence for Energy Conservation through the 2010 Green Toronto Awards for its recent initiatives, including 100 solar hot water panels, reflective roofs on 18 other buildings and the attainment of U of T’s first LEED Gold (CI) Certification
- Toronto’s Sustainability Office’s Rewire project was awarded third prize in the national category of the Canadian Association of University Business Officers’ (CAUBO) Quality and Productivity Awards 2009; the Rewire project aims to empower students, staff and faculty to reduce their energy consumption through small behaviour changes with high environmental impact
- The University of Toronto Mississauga campus received honourable mention from Smart Commute Mississauga as a smart commute workplace, and 3 of its students were awarded the Youth Conservationists Award by the Credit Valley Conservation Authority for work done on and off campus
- Windsor won the Enwin GreenSTAR Award
- Guelph’s Hospitality Services’ commitment to sustainability has been recognized with an “A” in the Food and Recycling category of the Sustainable Endowments Institute’s College Sustainability Report Card

## **Moving Forward**

Environmental sustainability is a complex goal that touches all aspects of university campuses. Although it will not be achieved overnight, progress has been made in many areas since the Survey of Green Initiatives was first conducted in 2009. More universities are making formal commitments to environmental sustainability and are planning to report their progress over time; more people are being engaged across campuses through multi-stakeholder groups and student initiatives; renewable energy generation is on the rise; and more courses and programs – especially at the graduate level – are being incorporated into campus offerings. Ontario’s universities are dedicated to making their operations more sustainable, and to building research and skills for the green economy.

Looking ahead, Ontario's campuses are planning to continue to implement green initiatives and a number of plans are already underway. Some examples of what to expect from the sector in the near future include:

- **Assessments** of current sustainability levels and energy consumption
- **Sustainability strategies** – e.g. the Office of the Vice-President, Administration and Finance at Windsor is developing a campus-wide sustainability strategy, which will be rolled out at the start of the new academic year
- **New degree programs** – e.g. Waterloo's School of Environment, Enterprise and Development is planning to launch the Master's of Development Practice
- **New research institutes** – e.g. the Waterloo Institute for Complexity & Innovation (WICI) is being developed to facilitate transdisciplinary, collaborative research focused on promoting innovation and resilience within complex adaptive systems
- **Development and implementation of greenhouse gas (GHG) reduction strategies**, including goals for campus GHG reductions supplemented by a full range of intended actions to achieve targets
- **Enhanced energy monitoring capabilities** – e.g. enhanced metering projects; utility sub-metering of all buildings with real-time feedback; Zerofootprint is collaborating with OCAD to create tools auditing and reporting on power generation from the proposed solar panels
- **Examination of potential for renewable energy generation**, such as photovoltaic energy – e.g. Queen's is exploring solar potential in order to take full advantage of the Feed-in Tariff program that is part of the Ontario Green Energy Act; Ottawa is looking to deploy one of the largest photo-voltaic solar arrays in the region, while helping researchers understand how to increase photo-cell efficiency; Nipissing has recently undertaken a new solar powered parking lot lighting system for evaluation, which may lead to future expansion across multiple campuses
- **Building improvements** – e.g. Ottawa is undertaking an energy performance upgrade of its five largest energy consuming buildings
- **Conversion of water systems** for conservation of water (e.g. in residences)
- **Increased use of locally grown food** in campus food services
- **Water fountain/bottle filling** (campus-wide)
- **Paper reduction** programs

## Appendix A: Methodology

In order to gather more detailed information about the sustainability efforts of Ontario's universities and ease the data collection process, the 2009 *Survey of Green Initiatives at Ontario Universities* was amended in 2010. University administrators, staff and faculty provided input on recommended changes to the 2009 survey, resulting in the following revised outline. The *2010 Survey of Green Initiatives at Ontario Universities* is included at the end of this report.

1. Building a Green Culture
  - a. Green Policy
  - b. Green Budget and Investment
  - c. Dedicated Staff
  - d. Student Involvement
  
2. Reducing Environmental Impacts
  - a. Emissions and Energy Use
  - b. Green Buildings
  - c. Green Transportation
  - d. Waste Management
  - e. Water Management
  - f. Nature Conservation
  - g. Green Procurement
  
3. Teaching and Learning
  - a. Green Courses and Programs
  - b. Environmental Research
  - c. Green Partnerships
  
4. Barriers and Best Practices

The 2010 survey was distributed to Ontario's universities via the Council of Senior Administrative Officers (CSAO) in summer 2010. Survey responses were collected and analyzed by the Council of Ontario Universities (COU) secretariat and compared to 2009 responses where possible.

As in 2009, the population surveyed included Ontario's 19 universities. Since the University of Toronto completes the survey separately for each of its three campuses – St. George, Mississauga and Scarborough – 22 responses represent 100% of the population. 19 universities participated in the 2010 Survey of Green Initiatives; however, not all institutions responded to every question. Where fewer than 19 responses were received for a question, the report analysis will indicate the number that submitted answers. Similarly, since the number of survey respondents varied in 2009 and 2010, the number of respondents is given, so that answers can be more effectively compared.

2010 Survey of Green Initiatives at Ontario Universities

1. Name of Institution (Please select):		
	Response Percent	Response Count
Algoma	0.0%	0
<b>Brock</b> <input type="checkbox"/>	5.0%	1
<b>Carleton</b> <input type="checkbox"/>	5.0%	1
<b>Guelph</b> <input type="checkbox"/>	5.0%	1
Lakehead	0.0%	0
<b>Laurentian</b> <input type="checkbox"/>	5.0%	1
<b>McMaster</b> <input type="checkbox"/>	5.0%	1
<b>Nipissing</b> <input type="checkbox"/>	5.0%	1
<b>OCAD</b> <input type="checkbox"/>	5.0%	1
<b>Ottawa</b> <input type="checkbox"/>	5.0%	1
<b>Queens</b> <input type="checkbox"/>	5.0%	1
<b>Ryerson</b> <input type="checkbox"/>	5.0%	1
<b>Toronto</b> <input type="checkbox"/>	5.0%	1
<b>Toronto-Mississauga</b> <input type="checkbox"/>	5.0%	1
<b>Toronto-Scarborough</b> <input type="checkbox"/>	5.0%	1
<b>Trent</b> <input type="checkbox"/>	5.0%	1
<b>UOIT</b> <input type="checkbox"/>	5.0%	1
<b>Waterloo</b> <input type="checkbox"/>	5.0%	1
<b>Western</b> <input type="checkbox"/>	5.0%	1
<b>Wilfrid Laurier</b> <input type="checkbox"/>	5.0%	1
<b>Windsor</b> <input type="checkbox"/>	5.0%	1
<b>York</b> <input type="checkbox"/>	5.0%	1
<i>answered question</i>		<b>20</b>

*skipped question*

0

## 2. Approximate Size of Campus (hectares):

Response  
Count

20

*answered question*

20

*skipped question*

0

## 3. Name of person(s) completing the survey:

Response  
Count

20

*answered question*

20

*skipped question*

0

## 4. Title:

Response  
Count

20

*answered question*

20

*skipped question*

0

## 5. Contact Phone #:

Response  
Count

20

*answered question*

20

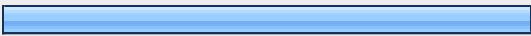
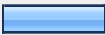

*skipped question*

0

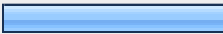
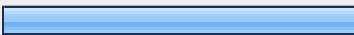
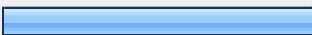
## 6. E-mail:

	Response Count
	20
<i>answered question</i>	20
<i>skipped question</i>	0




## 7. Does your campus have or is signatory to a formal declaration of commitment to environmental sustainability or stewardship (other than the 2009 COU Pledge)?

	Response Percent	Response Count
Yes 	80.0%	16
Have plans to develop one 	15.0%	3
No 	5.0%	1
<i>answered question</i>		20
<i>skipped question</i>		0



## 8. If so, please indicate which of the following applies to your campus:

	Response Percent	Response Count
Campus-wide sustainability policy 	33.3%	5
<b>Campus-wide environmental policy</b> 	53.3%	8
Talloires Declaration 	46.7%	7
Halifax Declaration	0.0%	0
Other (please specify)		5
<i>answered question</i>		15
<i>skipped question</i>		5

### 9. Does your campus conduct a campus-wide environmental or sustainability assessment or report?

	Response Percent	Response Count
Yes 	40.0%	8
Have plans to develop one 	45.0%	9
No 	20.0%	4
<b>answered question</b>		<b>20</b>
<b>skipped question</b>		<b>0</b>

### 10. If so, do you use any of the following tools?

	Response Percent	Response Count
a. Campus Sustainability Assessment Framework (CSAF) 	66.7%	4
b. Sustainability Tracking, Assessing and Rating System (STARS) 	33.3%	2
c. Global Reporting Initiative (GRI)	0.0%	0
Other (please specify)		8
<b>answered question</b>		<b>6</b>
<b>skipped question</b>		<b>14</b>

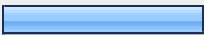

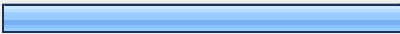
### 11. How often do you conduct the assessment or report?

	Response Count
	13
<b>answered question</b>	<b>13</b>
<b>skipped question</b>	<b>7</b>

**12. List and describe your university's key initiatives in the area of policy and administration aimed at promoting environmental sustainability since 2009 (please limit to 3 examples):**

	Response Count
	18
<i>answered question</i>	18
<i>skipped question</i>	2

**13. Do you have a dedicated budget for green initiatives?**

	Response Percent	Response Count
Yes 	30.0%	6
Have plans to develop one 	10.0%	2
No 	60.0%	12
<i>answered question</i>		20
<i>skipped question</i>		0

**14. If yes, what percentage of your operating budget does it represent?**



	Response Count
	6
<i>answered question</i>	6
<i>skipped question</i>	14




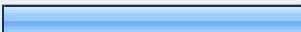
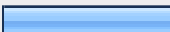
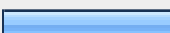
### 15. If no, how do you fund green initiatives?

	Response Count
	16
<i>answered question</i>	16
<i>skipped question</i>	4

### 16. Do you track any costs/savings resulting from green initiatives?

	Response Percent	Response Count
Yes 	70.0%	14
No 	30.0%	6
<i>answered question</i>		20
<i>skipped question</i>		0

### 17. Does your campus have a sustainability office or dedicated employee for leading green issues?

	Response Percent	Response Count
Yes, we have an office run by students 	5.0%	1
Yes, we have an office run by staff 	45.0%	9
Yes, we have a dedicated employee 	25.0%	5
No 	25.0%	5
<i>answered question</i>		20
<i>skipped question</i>		0

### 18. If yes, where is this office or person positioned within the university hierarchy?

	Response Percent	Response Count
Within facilities (middle manager)	71.4%	10
Reports directly to a VP	35.7%	5
In the student union	14.3%	2
Is an academic position	0.0%	0
Other (please specify)		6
<b>answered question</b>		<b>14</b>
<b>skipped question</b>		<b>6</b>



### 19. How many full time employees (FTEs) are focused on sustainability at your campus?

	Response Count
	20
<b>answered question</b>	<b>20</b>
<b>skipped question</b>	<b>0</b>

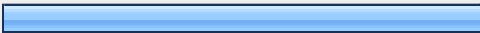


### 20. If you do not have a sustainability office or dedicated staff, how do you distribute responsibility for green issues at your campus?

	Response Count
	7
<b>answered question</b>	<b>7</b>
<b>skipped question</b>	<b>13</b>

## 21. Does your campus have a multi-stakeholder group focused on addressing green issues?

	Response Percent	Response Count
Yes 	95.0%	19
No 	5.0%	1
<b>answered question</b>		<b>20</b>
<b>skipped question</b>		<b>0</b>

## 22. If yes, who does the group report to?

	Response Percent	Response Count
a. Reports to the senate	0.0%	0
b. Reports to the Board	0.0%	0
<b>c. Reports to or advises a senior administrator</b> 	<b>72.2%</b>	<b>13</b>
d. Reports to or advises a middle manager other than a sustainability coordinator 	5.6%	1
e. Reports to or advises the sustainability coordinator 	27.8%	5
Other (please specify)		5
<b>answered question</b>		<b>18</b>
<b>skipped question</b>		<b>2</b>




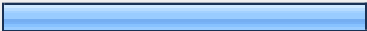

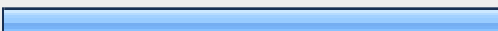

### 23. What is the mandate/role of this group?

	Response Count
	19
<i>answered question</i>	19
<i>skipped question</i>	1

### 24. In what ways are students driving sustainability on your campus (check all that apply)?

	Response Percent	Response Count
They are key drivers of change	75.0%	15
They are an integral part of identifying sustainability goals and practices	65.0%	13
They are a key partner in developing strategies and goals, but do not drive the decision-making process	50.0%	10
<b>The involvement of students and faculty in finding solutions to the institution's sustainability challenges is encouraged within specially designed educational and/or research programs</b>	<b>80.0%</b>	<b>16</b>
<b>Students have the opportunity to contribute towards solving the institution's sustainability challenges through extracurricular activities and/or as part of their on-campus living arrangements</b>	<b>80.0%</b>	<b>16</b>
Other (please explain)		5
<i>answered question</i>		20
<i>skipped question</i>		0




**25. Which of the following types of student-led initiatives are present on your campus (check all that apply)?**

		Response Percent	Response Count
<b>Student focused awareness initiatives</b>		95.0%	19
Student-led or assisted inventories or assessments		50.0%	10
Student fee that goes towards a sustainability fund		25.0%	5
Student-led residence challenges or other behavior change initiatives		55.0%	11
Student-led retrofits or energy production on campus		10.0%	2
Multi-stakeholder collaboration		75.0%	15
Staff-faculty focused programs that are led by students		15.0%	3
		<i>answered question</i>	<b>20</b>
		<i>skipped question</i>	<b>0</b>

**26. Briefly describe how you are engaging students in green initiatives on your campus (please limit to 3 examples):**

	Response Count
	19
<i>answered question</i>	<b>19</b>
<i>skipped question</i>	<b>1</b>

**27. Has your campus completed a greenhouse gas (GHG) inventory or carbon dioxide (CO2) emission inventory?**

	Response Percent	Response Count
Yes 	55.0%	11
Have plans to complete one 	30.0%	6
No 	15.0%	3
<i>answered question</i>		20
<i>skipped question</i>		0


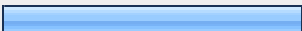

**28. If yes, what are the annual emissions from your campus?**

	Response Count
	14
<i>answered question</i>	14
<i>skipped question</i>	6

**29. If yes, please describe the methodology used to collect data (including start date, coverage, and reporting procedures):**

	Response Count
	11
<i>answered question</i>	11
<i>skipped question</i>	9


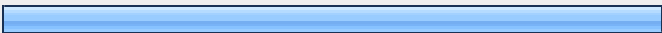
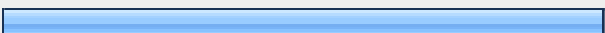

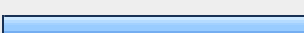

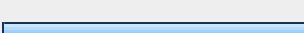

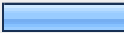
**30. Does your campus regularly set and review targets for reducing CO2 and other GHG emissions?**

	Response Percent	Response Count
Yes 	10.0%	2
Have plans to develop/developing such targets 	45.0%	9
No 	45.0%	9
<i>answered question</i>		20
<i>skipped question</i>		0


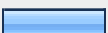
**31. If yes, what was your 2009 emissions reduction target? Did you meet it?**

	Response Count
	4
<i>answered question</i>	4
<i>skipped question</i>	16

**32. If your campus has completed a GHG or CO2 inventory, please indicate which items have been inventoried (select all that apply):**

	Response Percent	Response Count
Scope 1: Fertilizer 	36.4%	4
<b>Scope 1: Natural gas combustion (on campus)</b> 	100.0%	11
Scope 1: Fleet 	90.9%	10
<b>Scope 2: Purchased electricity, steam, heat or cooling energy</b> 	100.0%	11
Scope 3: Waste disposal 	45.5%	5
Scope 3: Procurement (embodies energy) 	9.1%	1
Scope 3: Commuting 	45.5%	5
Scope 3: Business travel 	18.2%	2
Scope 3: Other 	18.2%	2
Please specify:		4
<b>answered question</b>		<b>11</b>
<b>skipped question</b>		<b>9</b>

**33. Does your campus measure its energy use?**

	Response Percent	Response Count
Yes 	85.0%	17
No 	15.0%	3
<b>answered question</b>		<b>20</b>
<b>skipped question</b>		<b>0</b>






### 34. If yes, what is your annual energy consumption?

	Response Count
	17
<i>answered question</i>	17
<i>skipped question</i>	3



### 35. If yes, please describe the methodology used to collect data (including start date, coverage, and reporting procedures):

	Response Count
	17
<i>answered question</i>	17
<i>skipped question</i>	3






### 36. Which of the following energy systems does your campus employ (please select all that apply)?

	Response Percent	Response Count
District energy system 	94.7%	18
Cogeneration operation 	42.1%	8
Tri-generation operation 	5.3%	1
Other (please specify)		3
<i>answered question</i>		19
<i>skipped question</i>		1

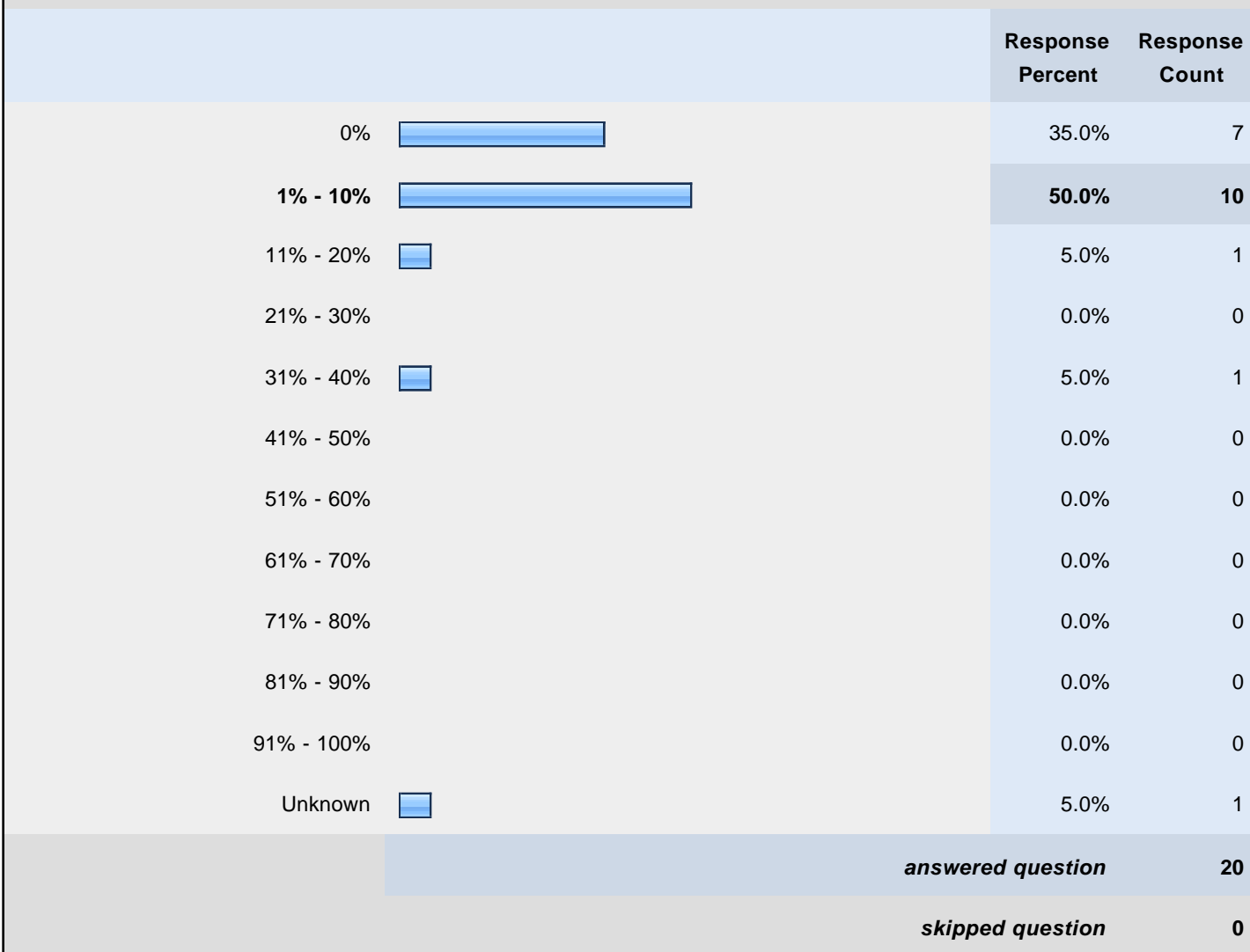
### 37. Does your university generate on-site renewable energy?

	Response Percent	Response Count
Yes 	60.0%	12
No, but have plans to 	40.0%	8
No, and have no plans to	0.0%	0
<b>answered question</b>		<b>20</b>
<b>skipped question</b>		<b>0</b>

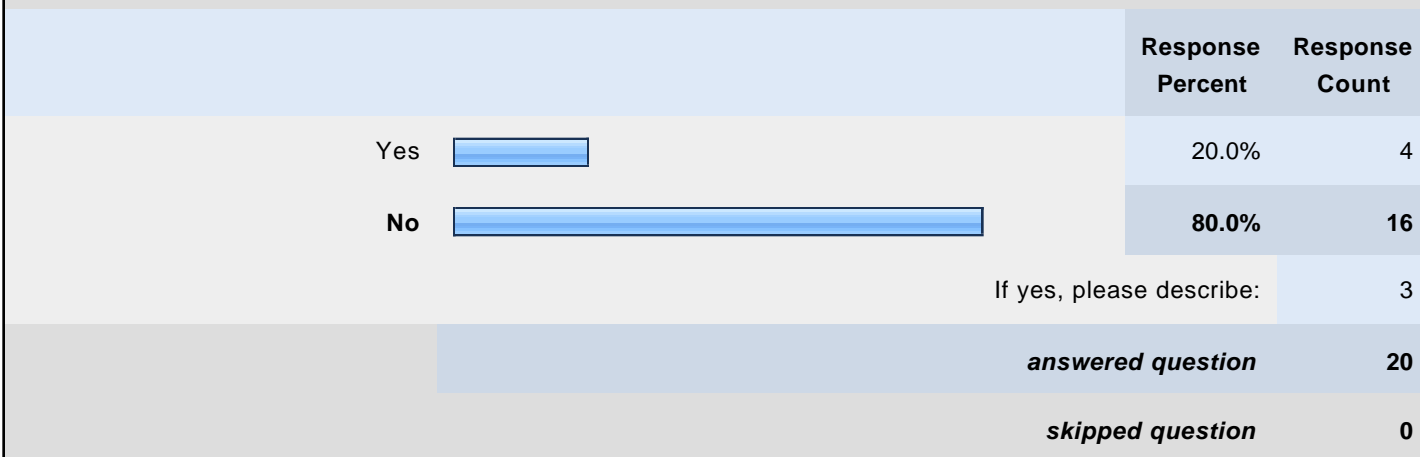
### 38. If yes, please select all that apply:

	Response Percent	Response Count
Wind 	6.3%	1
<b>Solar electric (photovoltaic)</b> 	<b>75.0%</b>	<b>12</b>
Solar thermal 	18.8%	3
Biomass 	6.3%	1
Geothermal 	25.0%	4
Other (please specify)		1
<b>answered question</b>		<b>16</b>
<b>skipped question</b>		<b>4</b>


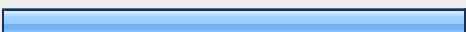
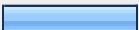
### 39. Approximately what percentage of your energy comes from on-campus generated renewable sources?



### 40. Do you purchase energy or renewable energy credits from off-campus renewable sources (e.g. Bullfrog Power)?




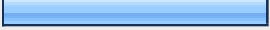
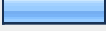
**41. Have you taken advantage of the Ontario Government feed-in tariff program that was introduced as part of the Green Energy Act?**

	Response Percent	Response Count
Yes 	10.0%	2
No, but have plans to 	70.0%	14
No 	20.0%	4
<i>answered question</i>		20
<i>skipped question</i>		0

**42. List and describe your university's key initiatives in the area of emissions and energy management since 2009 (please limit to 3 examples):**

	Response Count
	18
<i>answered question</i>	18
<i>skipped question</i>	2

**43. Has your campus implemented any green standards for new buildings or retrofits of existing buildings?**

	Response Percent	Response Count
Yes, campus-wide 	45.0%	9
Yes, in some buildings 	40.0%	8
No 	15.0%	3
<i>answered question</i>		20
<i>skipped question</i>		0


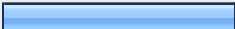
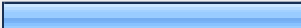
#### 44. If yes, which standards have you decided to use?

	Response Count
	17
<i>answered question</i>	17
<i>skipped question</i>	3

#### 45. If these standards include a certification process, have your buildings been certified? (please indicate the percentage of your total building stock that has been certified)

	Response Count
	16
<i>answered question</i>	16
<i>skipped question</i>	4

#### 46. Does your campus have a sustainable roofing standard?

	Response Percent	Response Count
Yes, campus-wide 	20.0%	4
Yes, in some buildings 	35.0%	7
No 	45.0%	9
<i>answered question</i>		20
<i>skipped question</i>		0

**47. Has your campus implemented any green roofs (roofs planted with vegetation) or cool roof systems on its buildings?**

	Response Percent	Response Count
Yes, campus-wide	10.0%	2
Yes, on some buildings	70.0%	14
No	20.0%	4
<i>answered question</i>		20
<i>skipped question</i>		0

**48. If yes, approximately what percentage of your buildings' roofs are green/cool?**

	Response Count
	17
<i>answered question</i>	17
<i>skipped question</i>	3

**49. Does your campus have a centralized control system to monitor energy use in buildings?**

	Response Percent	Response Count
Yes, campus-wide	55.0%	11
Yes, for some buildings	30.0%	6
No	15.0%	3
<i>answered question</i>		20
<i>skipped question</i>		0



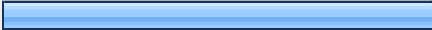




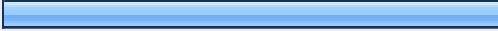
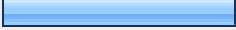
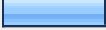

### 50. Does your campus have electronic meters at each building?

	Response Percent	Response Count
Yes, campus-wide	25.0%	5
Yes, in some buildings	65.0%	13
No	10.0%	2
<i>answered question</i>		20
<i>skipped question</i>		0

### 51. What percentage of your campus buildings are individually metered?



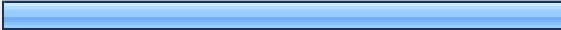




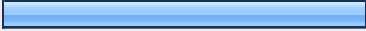

	Response Count
	15
<i>answered question</i>	15
<i>skipped question</i>	5

## 52. What IT initiatives has your campus implemented to reduce electrical loads (select all that apply)?

		Response Percent	Response Count
<b>Virtualization of servers</b>		85.0%	17
Teleworking		50.0%	10
Educational awareness		65.0%	13
Digital imaging		70.0%	14
Enhanced videoconferencing		70.0%	14
Remote management of CPUs		65.0%	13
<b>Efficient servers</b>		85.0%	17
Energy Star labelled equipment		75.0%	15
Flash memory storage of data		35.0%	7
Data center heat recovery		15.0%	3
Decommissioning inefficient building controls		40.0%	8
	Other (please specify):		8
		<b>answered question</b>	<b>20</b>
		<b>skipped question</b>	<b>0</b>



**53. Which of the following heating, ventilation and air conditioning (HVAC) upgrades has your campus implemented? Please select all that apply:**

		Response Percent	Response Count
Thermal insulation of buildings		65.0%	13
Downsizing of fans and pumps		55.0%	11
CO2 censors		85.0%	17
<b>Variable air-volume ventilation</b>		<b>100.0%</b>	<b>20</b>
Air-side economizers		75.0%	15
<b>Direct digital controls</b>		<b>100.0%</b>	<b>20</b>
Thermostat setbacks		85.0%	17
Window film		55.0%	11
Variable speed drive		95.0%	19
Other (please specify):			7
<b>answered question</b>			<b>20</b>
<b>skipped question</b>			<b>0</b>

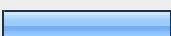
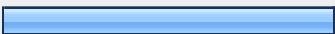
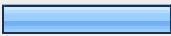
**54. Which of the following lighting initiatives has your campus implemented? Please select all that apply:**

	Response Percent	Response Count
CFLs	90.0%	18
<b>Fluorescent tube upgrades (e.g. from T12 to T8)</b>	<b>95.0%</b>	<b>19</b>
T5s	65.0%	13
Occupancy sensors	90.0%	18
Networked lighting	50.0%	10
Auto-dimming lighting (with daylight sensors)	50.0%	10
Behaviour change campaigns	60.0%	12
<b>LED exit signs</b>	<b>95.0%</b>	<b>19</b>
LED emergency lighting	50.0%	10
Outdoor lighting efficiency	80.0%	16
Other (please specify):		4
<b>answered question</b>		<b>20</b>
<b>skipped question</b>		<b>0</b>

**55. Has your campus banned the use of incandescent lights?**

	Response Percent	Response Count
Yes	20.0%	4
No	80.0%	16
<b>answered question</b>		<b>20</b>
<b>skipped question</b>		<b>0</b>

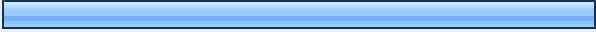


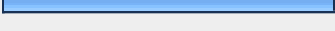

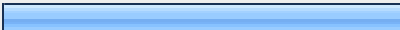
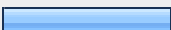

**56. Does your campus measure the indoor air quality of its buildings?**

	Response Percent	Response Count
Yes, campus-wide 	25.0%	5
Yes, in some buildings 	50.0%	10
No 	25.0%	5
<i>answered question</i>		20
<i>skipped question</i>		0

**57. Describe your university's key initiatives in the area of green buildings aimed at promoting environmental sustainability since 2009 (please limit to 3 examples):**

	Response Count
	18
<i>answered question</i>	18
<i>skipped question</i>	2





**58. Does your campus offer any of the following to reduce transportation emissions (check all that apply)?**

		Response Percent	Response Count
Free or discounted bus or public transit passes to students ?		90.0%	18
Free or discounted bus or public transit passes to faculty and staff?		55.0%	11
A carpooling or vanpooling program?		65.0%	13
A bike or car sharing program?		50.0%	10
<b>Adequate and protected bicycle racks?</b>		<b>95.0%</b>	<b>19</b>
Bicycle lanes?		60.0%	12
Preferred parking for high efficiency vehicles?		25.0%	5
Options for staff teleworking?		30.0%	6
<i>answered question</i>			<b>20</b>
<i>skipped question</i>			<b>0</b>

**59. What percentage of university-owned vehicles on campus use alternative fuels (e.g., electric, hybrid electric, natural gas, propane, biodiesel, biofuels, etc.)?**

	Response Count
	18
<i>answered question</i>	<b>18</b>
<i>skipped question</i>	<b>2</b>



**60. Does your campus monitor fuel use and set fuel reduction goals (this may include decommissioning low efficiency vehicles)?**

	Response Percent	Response Count
Yes, on all fleet vehicles 	10.0%	2
Yes, on some fleet vehicles 	35.0%	7
<b>No</b> 	<b>45.0%</b>	<b>9</b>
Not applicable 	10.0%	2
<i>answered question</i>		<b>20</b>
<i>skipped question</i>		<b>0</b>

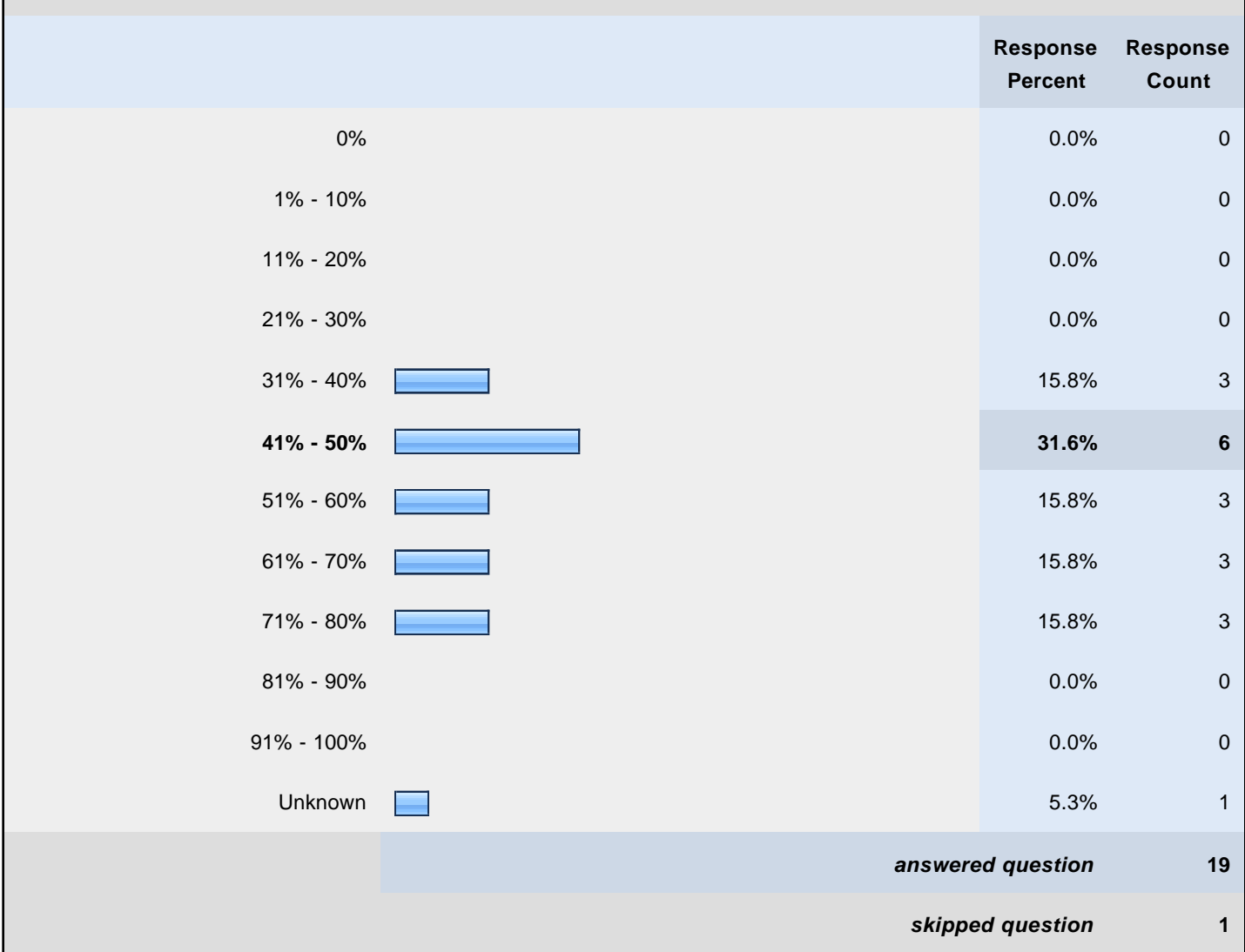
**61. List and describe your university's key initiatives in the area of transportation and fleet management aimed at promoting environmental sustainability since 2009 (please limit to 3 examples):**

	Response Count
	17
<i>answered question</i>	
<b>17</b>	
<i>skipped question</i>	
<b>3</b>	

**62. Does your campus conduct waste composition studies or audits?**

	Response Percent	Response Count
Yes 	95.0%	19
No 	5.0%	1
<i>answered question</i>		<b>20</b>
<i>skipped question</i>		<b>0</b>


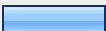

### 63. If yes, what was your campus' diversion rate in 2009?



### 64. If yes, please describe the methodology used to collect data (including start date, coverage, and reporting procedures):

Response	Response Count
	18
<b>answered question</b>	<b>18</b>
<b>skipped question</b>	<b>2</b>





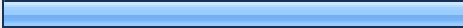
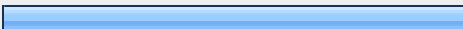

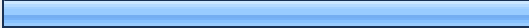
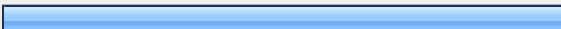
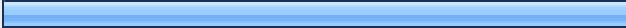


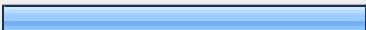
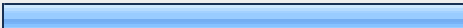
**65. Does your campus regularly set and review targets for reducing waste?**

		Response Percent	Response Count
Yes		45.0%	9
Have plans to develop/developing such targets		15.0%	3
No		40.0%	8
<i>answered question</i>			<b>20</b>
<i>skipped question</i>			<b>0</b>

**66. If yes, what was your 2009 waste reduction target? Did you meet it?**

		Response Count
		11
<i>answered question</i>		<b>11</b>
<i>skipped question</i>		<b>9</b>

**67. Please indicate which items your campus collects for recycling or appropriate disposal (select all that apply):**

		Response Percent	Response Count
<b>Paper and cardboard</b>		100.0%	20
Aluminum		90.0%	18
Glass		95.0%	19
<b>Plastic</b>		100.0%	20
Organic waste (compost)		70.0%	14
Construction and demolition waste (e.g. scrap metal, wood, concrete, bricks or stone)		70.0%	14
Non-construction scrap wood		70.0%	14
Non-construction metal		80.0%	16
Electronics (e.g. printers, computers, fax machines, cell phones, printer cartridges)		85.0%	17
Batteries		95.0%	19
Polystyrene		35.0%	7
Fluorescent tubes and CFL light bulbs		75.0%	15
Motor oils		55.0%	11
Grease and frying oils		70.0%	14
		<b>answered question</b>	<b>20</b>
		<b>skipped question</b>	<b>0</b>




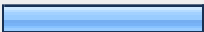

**68. Does your campus have a materials surplus, exchange or recovery program, for example, for computers, furniture, office supplies or lab equipment?**

	Response Percent	Response Count
Yes, campus-wide	65.0%	13
Yes, in some campus units	35.0%	7
No	0.0%	0
<i>answered question</i>		<b>20</b>
<i>skipped question</i>		<b>0</b>

**69. Does your campus have any programs (i.e. behaviour modification campaigns) specifically targeted at material use and reduction?**

	Response Percent	Response Count
Yes, campus-wide	35.0%	7
Yes, in some campus units	45.0%	9
No	20.0%	4
<i>answered question</i>		<b>20</b>
<i>skipped question</i>		<b>0</b>

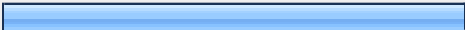
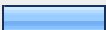


**70. Do your campus hospitality service organizations have programs encouraging students and employees to bring their own containers for food and beverages?**

	Response Percent	Response Count
Yes, campus-wide 	60.0%	12
Yes, in some campus units 	30.0%	6
No 	10.0%	2
<i>answered question</i>		<b>20</b>
<i>skipped question</i>		<b>0</b>




**71. List and describe your university's key initiatives in the area of recycling and waste management since 2009 (please limit to 3 examples):**

	Response Count
	18
<i>answered question</i>	<b>18</b>
<i>skipped question</i>	<b>2</b>

**72. Does your campus monitor water consumption?**

	Response Percent	Response Count
Yes, campus-wide 	70.0%	14
Yes, in some areas 	15.0%	3
No, but have plans to start 	5.0%	1
No 	10.0%	2
<i>answered question</i>		<b>20</b>
<i>skipped question</i>		<b>0</b>

### 73. Does your campus have meters to measure water consumption?

	Response Percent	Response Count
Yes, on all buildings 	45.0%	9
Yes, on some buildings 	45.0%	9
No 	15.0%	3
<i>answered question</i>		20
<i>skipped question</i>		0

### 74. If so, approximately what percentage of your buildings have water meters?

	Response Count
	17
<i>answered question</i>	17
<i>skipped question</i>	3

### 75. If measured, what is the annual water consumption on your campus?

	Response Count
	16
<i>answered question</i>	16
<i>skipped question</i>	4

**76. What water efficiency upgrades has your campus implemented (select all that apply)?**

	Response Percent	Response Count
<b>Low flow toilets</b>	89.5%	17
Low flow shower heads	84.2%	16
<b>Low flow faucets</b>	89.5%	17
Recirculating fountains	36.8%	7
Chilled water	63.2%	12
Conversion of water - cooled equipment to air cooled	36.8%	7
Other (please specify):		7
<b>answered question</b>		<b>19</b>
<b>skipped question</b>		<b>1</b>

**77. Please indicate for which of the following water sources your campus has implemented reuse strategies to control water quantity used and/or quality:**

	Quantity Control	Quality Control	Response Count
Grey water	100.0% (5)	60.0% (3)	5
Black water	100.0% (1)	100.0% (1)	1
Storm water	100.0% (10)	70.0% (7)	10
Other	0.0% (0)	0.0% (0)	0
Please specify:			5
<b>answered question</b>			<b>12</b>
<b>skipped question</b>			<b>8</b>


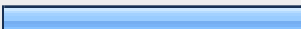

**78. Have you implemented any of the following rain or storm water management techniques (select all that apply):**

	Response Percent	Response Count
Bioswales	68.8%	11
Detention ponds	62.5%	10
Cisterns	56.3%	9
Permeable paving	37.5%	6
Rain gardens	25.0%	4
Down spout conversion away from storm drainage	31.3%	5
Other (please specify):		6
<i>answered question</i>		<b>16</b>
<i>skipped question</i>		<b>4</b>


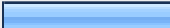
**79. List and describe your university's key initiatives in the area of water management since 2009 (please limit to 3 examples):**

	Response Count
	17
<i>answered question</i>	<b>17</b>
<i>skipped question</i>	<b>3</b>

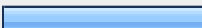
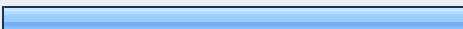
**80. Has your campus implemented any habitat restoration (e.g., river, stream, prairie or meadow, wetland, forest) programs?**

	Response Percent	Response Count
Yes, campus-wide 	15.0%	3
Yes, in some campus units 	45.0%	9
Off-campus areas	0.0%	0
No 	40.0%	8
<i>answered question</i>		<b>20</b>
<i>skipped question</i>		<b>0</b>


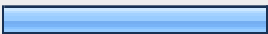
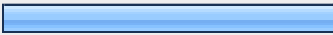
**81. Does your campus have any protected natural areas?**

	Response Percent	Response Count
Yes 	75.0%	15
No 	25.0%	5
<i>answered question</i>		<b>20</b>
<i>skipped question</i>		<b>0</b>

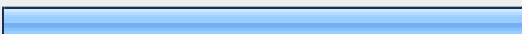
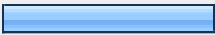

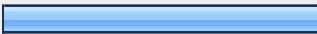
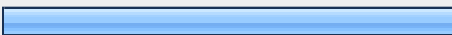
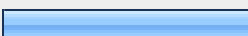
**82. Does your campus use pesticides (outdoor or indoor)?**

	Response Percent	Response Count
Yes, campus-wide	0.0%	0
Yes, in some areas 	30.0%	6
No 	70.0%	14
<i>answered question</i>		<b>20</b>
<i>skipped question</i>		<b>0</b>





### 83. Does your campus use artificial fertilizers?

	Response Percent	Response Count
Yes, campus-wide 	10.0%	2
Yes, in some campus units 	40.0%	8
No 	50.0%	10
<i>answered question</i>		20
<i>skipped question</i>		0




### 84. Please indicate whether your campus has specified in its purchasing criteria that products must:

	Response Percent	Response Count
Contain recycled content 	78.9%	15
<b>Be energy efficient</b> 	89.5%	17
Come from sustainably managed sources 	31.6%	6
Come from local sources 	31.6%	6
Be fair trade 	47.4%	9
Be sweat-shop free 	68.4%	13
Contain no toxic materials 	36.8%	7
Other (please specify):		7
<i>answered question</i>		19
<i>skipped question</i>		1

**85. What sustainable food options are available on your campus (select all that apply)?**

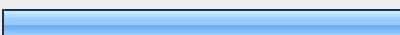
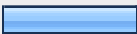
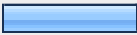
	Response Percent	Response Count
Vegetarian 	95.0%	19
Vegan 	85.0%	17
Fair trade 	80.0%	16
Locally sourced 	85.0%	17
Other (please specify):		6
<b>answered question</b>		<b>20</b>
<b>skipped question</b>		<b>0</b>

**86. Does your campus have a program for reducing consumption of bottled water?**

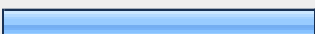


	Response Percent	Response Count
Yes 	60.0%	12
No, but have plans to develop one 	25.0%	5
No 	15.0%	3
<b>answered question</b>		<b>20</b>
<b>skipped question</b>		<b>0</b>



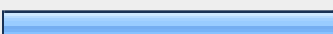

### 87. Does your campus have a green cleaning program?

	Response Percent	Response Count
Yes, campus-wide 	60.0%	12
Yes, in some campus units 	20.0%	4
No 	20.0%	4
<i>answered question</i>		20
<i>skipped question</i>		0

### 88. If so, does your campus require third party verification of environmental cleaning products?

	Response Percent	Response Count
Yes, for all products 	47.1%	8
Yes, for some products 	29.4%	5
No 	23.5%	4
<i>answered question</i>		17
<i>skipped question</i>		3

### 89. Does your campus have a road salt reduction policy or follow the Ministry of Environment guidelines for road salt use, salt storage and reduction?

	Response Percent	Response Count
Yes, campus-wide 	50.0%	10
Yes, in some campus units	0.0%	0
No 	50.0%	10
<i>answered question</i>		20
<i>skipped question</i>		0

**90. List and describe your university's key initiatives in the area of purchasing and procurement aimed at promoting environmental sustainability since 2009 (please limit to 3 examples):**

	Response Count
	17
<i>answered question</i>	17
<i>skipped question</i>	3

## 91. Does your campus offer any of the following:

	Yes	We have plans to develop one	No	Not applicable	Response Count
Undergraduate major or specialist in environmental or sustainability studies	<b>78.9% (15)</b>	5.3% (1)	15.8% (3)	0.0% (0)	19
Undergraduate minor in environmental or sustainability studies	<b>63.2% (12)</b>	15.8% (3)	21.1% (4)	0.0% (0)	19
Undergraduate interdisciplinary degree in environmental or sustainability studies	<b>73.7% (14)</b>	15.8% (3)	10.5% (2)	0.0% (0)	19
Undergraduate certificate or other recognition in environmental or sustainability studies	41.2% (7)	5.9% (1)	<b>47.1% (8)</b>	5.9% (1)	17
Direct-entry environmental Masters program	<b>60.0% (12)</b>	10.0% (2)	30.0% (6)	0.0% (0)	20
Collaborative environmental Masters program between multiple departments or units	<b>60.0% (12)</b>	5.0% (1)	35.0% (7)	0.0% (0)	20
Direct-entry environmental Doctoral program	<b>50.0% (9)</b>	0.0% (0)	<b>50.0% (9)</b>	0.0% (0)	18
Collaborative environmental Doctoral programs between multiple departments or units	41.2% (7)	0.0% (0)	<b>58.8% (10)</b>	0.0% (0)	17
Other	<b>50.0% (2)</b>	25.0% (1)	25.0% (1)	0.0% (0)	4
				Please specify:	4
				<b>answered question</b>	<b>20</b>
				<b>skipped question</b>	<b>0</b>



**92. Do departments in the following areas offer any courses on environmental issues? If so, please indicate if they are a core course in a program.**

	Undergraduate	Core course	Graduate	Core course	Response Count
Natural Sciences	<b>56.3% (9)</b>	37.5% (6)	6.3% (1)	0.0% (0)	16
Physical Sciences	<b>64.3% (9)</b>	28.6% (4)	7.1% (1)	0.0% (0)	14
Health Sciences	<b>81.8% (9)</b>	18.2% (2)	0.0% (0)	0.0% (0)	11
Social Sciences	<b>68.8% (11)</b>	18.8% (3)	12.5% (2)	0.0% (0)	16
Humanities	<b>90.9% (10)</b>	0.0% (0)	9.1% (1)	0.0% (0)	11
Engineering	<b>53.8% (7)</b>	30.8% (4)	15.4% (2)	0.0% (0)	13
Architecture and Design	42.9% (3)	<b>57.1% (4)</b>	0.0% (0)	0.0% (0)	7
Business	<b>69.2% (9)</b>	23.1% (3)	7.7% (1)	0.0% (0)	13
Teacher Education	<b>77.8% (7)</b>	11.1% (1)	11.1% (1)	0.0% (0)	9
<i>answered question</i>					<b>19</b>
<i>skipped question</i>					<b>1</b>

**93. Please describe your university's key initiatives since 2009 in the area of integrating sustainability concepts into curriculum.**

	Response Count
	17
<i>answered question</i>	<b>17</b>
<i>skipped question</i>	<b>3</b>

**94. Has your campus added any research institutes since 2009 that specifically focus on environmental issues (e.g. climate change or clean energy)?**

	Response Percent	Response Count
Yes 	47.4%	9
No 	52.6%	10
If yes, please provide name/website:		5
<i>answered question</i>		19
<i>skipped question</i>		1


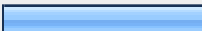
**95. If yes, please provide their names / websites:**

	Response Count
	11
<i>answered question</i>	11
<i>skipped question</i>	9

**96. Please list any major university-initiated or faculty-driven research projects related to sustainability that are currently underway or were completed in the last year:**

	Response Count
	16
<i>answered question</i>	16
<i>skipped question</i>	4

**97. Has your campus established any partnerships with businesses, local organizations or government to promote environmental sustainability since 2009?**

	Response Percent	Response Count
Yes 	70.0%	14
No 	30.0%	6
<i>answered question</i>		<b>20</b>
<i>skipped question</i>		<b>0</b>

**98. If yes, please describe (include who was involved, whether funding was provided, goals of the partnership, etc.):**

	Response Count
	15
<i>answered question</i>	<b>15</b>
<i>skipped question</i>	<b>5</b>

**99. Please list any other “green” initiatives in place on your campus in the last year not captured in previous sections of this survey (e.g. awareness-building events, etc.).**

	Response Count
	14
<i>answered question</i>	<b>14</b>
<i>skipped question</i>	<b>6</b>

**100. List any awards/recognition related to environmental sustainability practices that your university received in the last year.**

	Response Count
	12
<i>answered question</i>	12
<i>skipped question</i>	8

**101. Please list key barriers challenging the implementation of environmental initiatives on your campus:**

	Response Count
	15
<i>answered question</i>	15
<i>skipped question</i>	5

**102. Please list any best practices that have facilitated implementation of environmental initiatives on your campus:**

	Response Count
	13
<i>answered question</i>	13
<i>skipped question</i>	7

**103. Please list any future plans in development or underway at your campus to improve your environmental performance:**

	Response Count
	16
<i>answered question</i>	16
<i>skipped question</i>	4