Developing a First-Time Sustainable Development Report for a Higher Education Institution:
Process, Content and Format

by

Natalia Moudrak

A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Master of Arts
in
Planning

Waterloo, Ontario, Canada, 2011

AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

This thesis presents a seven-step process for sustainability report development within the higher education sector. Currently, there exists a variety of sustainability indicators and sustainability assessment tools to aid local governments, corporations and higher education institutions in sustainability performance measurement and reporting. Such variety illustrates the value-laden nature of defining sustainability, determining the relative importance of environmental, social and economic facets, and selecting performance evaluation methods. While the municipal and corporate sectors can benefit from step-by-step guidance on the process of sustainability reporting, such guidance is weak in the higher education sector. To address this issue, empirical evidence from the University of Waterloo (Waterloo, Ontario, Canada) is complemented with an analysis of select municipal and corporate sustainability reporting processes to arrive at the seven-step process for sustainability report development at the higher education sector. Therefore, this thesis is of particular interest to practitioners undertaking sustainability reporting within the higher education sector for the first time.

Acknowledgements

With the greatest sense of appreciation I would like to express my thanks to the following individuals who have played a crucial role in providing guidance and support fundamental to the completion of this Thesis and the *University of Waterloo Sustainable Development Report 2010*:

Dr. Blair Feltmate for inspiration, motivation and rigor with which he guided my efforts from the earliest stages of the *University of Waterloo Sustainable Development Report 2010* creation. I also thank Dr. Blair Feltmate for ample advice, opportunity to learn from his expertise and for the inclusion in conferences and talks, which have lead to my personal growth and development.

Dr. Amelia Clarke for resolving my fear of writing this Thesis. I cannot imagine how I would have proceeded without your weekly deadlines, Monday-noon meetings and constant assurance that I am on the right track.

Edie Cardwell for always being there to answer my never-ending questions; for being positive, supportive and kind.

The University of Waterloo staff who welcomed the idea of the *University of Waterloo Sustainable Development Report 2010* creation and who supported my quest for sustainability data collection and story-telling. Thank you for the patience and the time you have spent educating me.

The Sustainable Development Advisory Committee for guidance throughout the entire process of the *University of Waterloo Sustainable Development Report 2010* conceptualization and for all of your valuable feedback.

The Faculty of Environment Dean's Advisory Council for initiating and supporting the *University of Waterloo Sustainable Development Report 2010* development.

Table of Contents

vi

List of Tables

List of Figures

Chapter 1
Introduction

Few would argue against the fact that higher education institutions, such as universities, colleges and trade-schools, have a significant role to play in advancing the sustainable development movement. Often compared to small cities or corporations due to their size and operations, these higher education institutions are the incubators for many of tomorrow's leaders and decision-makers (Eagan *et al.*, 2008; Orr, 2004; Stafford, 2010). As such, higher education institutions are believed to hold special responsibility in integrating sustainability both in their operations to reduce their environmental footprint, and in delivering learning and research opportunities to advance the field (Cortese, 2003; Mathews, 1997; Velazquez *et al.*, 2006). In recognition of their unique role, some higher education institutions have signed sustainability-related declarations that committed them to various actions to drive the movement forward (Herremans and Allwright, 2000; Wright, 2002). Similarly, some of these institutions have undertaken sustainability performance assessments, created Sustainability Co-ordinator positions, and assigned Sustainability Committees to develop their sustainability-plans and objectives and manage sustainability initiatives (Bardati, 2006; Mitchell, 2011; Herremans and Allwright, 2000; Viebahn, 2002). However commendable such actions may be, the uptake of sustainability reporting to communicate sustainability effort within the higher education sector has been slow (Walton *et al.*, 1997). Sustainable development reporting has experienced significant growth in the past decade within corporations, yet it is has not become a common practice among the majority of higher education institutions (Fonseca *et al.*, 2010; Global Reporting Initiative, 2011b). This is unfortunate, as a number of benefits from sustainability reporting within the higher education sector exist, including better stakeholder communication, improved internal processes and potential cost savings (Bardati, 2006).

One of the barriers to sustainability reporting among higher education institutions may have been the lack of sector-specific guidance, or of a step-by-step process for developing sustainability reports at the higher education sector (Clarke and Kouri, 2009; Lozano, 2011; Taddei-Bringas *et al.*, 2008). In contrast, such step-by-step guidance is evident at the municipal and corporate sector practitioner literature (ICLEI, 1996; Commonwealth of Australia, 2000; Maclaren, 1996b; Global Reporting Initiative, 2011a; Mitchell, 2008). Furthermore, academic literature emphasizes the value-laden nature of the process and provides a thorough insight into the intricacies of selecting

1

appropriate sustainability performance indicators and engaging appropriate stakeholders (Bossel, 1996; Bell and Morse, 2004; Cloquell-Ballester *et al.*, 2006; Donnelly *et al.*, 2007; Gustavson *et al.*, 1999; Rametsteiner *et al.*, 2011; Turnhout *et al.*, 2007; Wilson *et al.*, 2007). Today, thousands of sustainability, sustainable development (SD), environmental, social and governance (ESG), triple bottom line (TBL) and non-financial or corporate social responsibility (CSR) reports are produced, with the terms used interchangeably to describe different degrees of focus on environmental, social or governance issues (Ioannou and Serafeim, 2011). Similarly, the terms 'sustainability' and 'sustainable development' are also used in this paper interchangeably.

This thesis draws both on practitioner and academic literature, as well as on the empirical evidence of developing the first sustainable development report at the University of Waterloo (Waterloo, Ontario, Canada) to arrive at a seven-step process for developing a first-time sustainability report for the higher education sector. Often known as "process organizers", planners hold a special role in advancing sustainability through envisioning exercises, consensus-building and public education (Wheeler, 2004). This Thesis illustrates the applicability of planning expertise as pertaining to the process for the first-time sustainability report development within the higher education sector. Specifically, the main research question of this thesis is:

What is the process for developing a first-time sustainability report for a higher education institution?

Relevant concepts and examples of sustainable development reporting processes within the municipal and corporate sectors are introduced in the Literature Review chapter. The use of grounded theory and action research, the methods of site selection, data collection, data verification, as well as ethical considerations to develop the *University of Waterloo Sustainable Development Report 2010* are discussed in the Methodology chapter. The seven-step process for first-time sustainability report development at the higher education sector is profiled in the Results- Part A chapter. The thesis culminates with a Discussion and Conclusion chapter, which provides the rationale for the seven-step process, explains major differences between the empirically-derived seven-step process and the literature review findings, clarifies major limitations, and contains recommendations for field practitioners considering undertaking sustainability reporting within the higher education sector. In addition to the central discussion pertaining to the process for first-time sustainability report development within the higher education sector, this thesis addresses a second research question:

2

What content should a sustainable development report for a higher education institution include and what should its format be?

Chapter 5, along with Appendix I, profile the *University of Waterloo Sustainable Development Report 2010* and address this question.

Chapter 2

Literature Review

This chapter provides a brief background on the concept of sustainable development and outlines intricacies associated with sustainable development performance measurement and reporting. To understand the process behind sustainability report development, the value-laden nature of sustainability performance measurement is explained next. The various sustainability reporting tools and the impetus for sustainability reporting at each of these sectors are discussed after. Examples of the municipal and corporate sustainability reporting processes are then contrasted to the proposed seven-step process for first-time sustainability report development within the higher education sector in the subsequent chapters. The chapter concludes with a discussion of sustainability concepts in relevance to the planning practice.

2.1 Background

The most commonly cited definition of 'sustainable development' as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" was introduced in the 1987 World Commission on Environment and Development (WCED) *Brundtland Commission Report* (World Commission on Environment and Development, 1987, p. 43). The term became well-known following the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, in 1992, where Agenda 21 was introduced (Bell and Morse, 2008). The document, adopted by more than 178 governments, emphasized three main aspects of sustainable development – social, economic and environmental, and suggested a number of implementation means (Bell & Morse, 2008). To ensure effective follow-up to Agenda 21, the United Nations Commission on Sustainable Development (CSD) and the Division for Sustainable Development (DSD) were established (United Nations, 2011a). In 2002, international commitment to sustainable development was reaffirmed at the World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa, where the Johannesburg Plan of Implementation (JPOI) was signed by all attending WSSD member states (United Nations, 2002). Reflective of high-level political commitment to Agenda 21, governments have since developed their own policies and strategies on sustainable development (Ioannou and Serafeim, 2011). For example, national reporting on sustainable development became mandatory for the first time in Finland in 1997, and then in

Australia, Austria, Canada, China, Denmark, France, Germany, Greece, Indonesia, Italy, Malaysia, Netherlands, Norway, Portugal, Sweden and the United Kingdom followed (Ioannou and Serafeim, 2011).

2.2 Sustainability Indicators

Chapter 40 of Agenda 21 called for indicator development as means to "increase focus on sustainable development and assist decision-makers at all levels to adopt sound national sustainable development policies" (United Nations, 2011b). Indicators are "measures that can be used to illustrate and communicate complex phenomena simply, including trends and progress over time" (European Environmental Agency, 2005, p. 7). More broadly, an indicator is a "measurable descriptor, quantitative or qualitative, of normative interest which facilitates assessment of the past, current, or future state or performance of system constituent parts, controls, and feedback loops as well as the system as a whole" (Hodge, 1995, p. 299). In terms of sustainability performance measurement, aggregated sets of sustainability indicators are used in sustainability indicator frameworks and sustainability assessment tools (Hak *et al.*, 2007). Although the majority of performance indicators are quantitative in nature to allow for seamless benchmarking over time, qualitative information is necessary to supplement the numbers for a meaningful sustainability assessment (Bell and Morse, 2008).

2.2.1 The Value-Laden Indicator Selection Process

Today, many organizations, such as the United Nations Commission on Sustainable Development (CSD), the European Environmental Agency (EEA), the United States Environmental Protection Agency (EPA) and the Organization for Economic Co-operation and Development (OECD) have developed their own sets of sustainability indicators. The Department of Economic and Social Affairs (DESA) of the United Nations Secretariat effectively summarizes reasons behind the diversity of sustainable development indicators that got developed over time.

> Indicators of sustainable development at the national level are often developed through dynamic interactive processes and dialogues among a wide range of stakeholders, including government representatives, technical experts and civil society representatives. The process allows participants to define sustainability from their own perspectives, taking locally relevant aspects as well as their own value systems into account. […] Diversity of core values, indicator processes and sustainable development theories have resulted in the

development and application of different frameworks. The main differences among them are the ways in which they conceptualize the key dimensions of sustainable development, the inter-linkages among these dimensions, the way they group the issues to be measured, and the concepts by which they justify the selection and aggregation of indicators.

<div align="right">United Nations, 2007, p. 39</div>

The inherently value-laden approach to sustainability definition and indicator selection is stressed in academic literature (Bossel, 1996; Gustavson *et al.*, 1999; Rametsteiner *et al.*, 2011; Turnhout *et al.*, 2007; Wilson *et al.*, 2007). "Many indicator exercises have retreated into philosophical discussions relating to the meaning and implications of sustainable development. The only major point of consensus from these efforts is that sustainable development means different things to different people" (Gustavson *et al.*, 1999, p. 118). According to Levett, "the struggle to find and use indicators of sustainable development is intimately bound up with the process of deciding what we mean by sustainable development and what we shall do about it" (Levett, 1998, p. 291). Even in scientific circles, researchers make value-judgments when deciding on the best indicators to include in sustainability assessments (Bossel, 1996; Bell and Morse, 2004).

Those who decide on what to sustain across a range of factors (ecological, economic, and social) are required to make normative decisions based on for example technical knowledge, but also on more or less explicit normative philosophical and political perceptions and intentions. It implies that those participating in the process are not only acting in their technical expert capacity, but also as political citizens taking normative decisions on what aspects to uphold. Just as easily, politically driven indicator development processes can easily hide behind the knowledge creation activity, downplaying the norm-creating activity.

<div align="right">Rametsteiner *et al.*, 2011, p. 62</div>

Differences in priorities and values at all levels of decision-making explain why most sustainability tools favour more strongly one of the standard dimensions of sustainability - economic, social, or environmental (Wilson *et al.*, 2007). To ensure sufficient representation of values in the process of sustainability definition and indicator selection, a multidisciplinary approach that engages key stakeholders is recommended (Donnelly *et al.*, 2007). Early-stage stakeholder participation to support consensus-building reduces the chance of conflicts between sustainable development promoters and other stakeholders (Cloquell-Ballester *et al.*, 2006). Similarly, more consideration should be given to the value-laden nature of higher education sustainability reporting. A study of seven Canadian universities revealed that a mixture of the Global Reporting Initiative (GRI), Sustainability Tracking, Assessment, & Rating System (STARS) and Campus Sustainability Assessment Framework (CSAF) indicators was used for sustainability reporting (Fonseca *et al.*,

2010). There were only three common indicator categories that every university chose to measure: 'energy', 'emissions, effluents and wastes' and 'recycled paper' (Fonseca *et al.*, 2010).

2.2.2 Indicator Validation

Since the role of sustainability performance tracking is usually to aid decision-making and improve public awareness, the availability of reliable data, policy relevance and utility for users, are top considerations in the indicator selection process (EPA 2010; EEA 2005; OECD, 2003; UNCED, 1992). Argued similarly, "an indicator will be validated if it is scientifically designed, if the information it supplies is relevant, and if it is meaningful to the end user" (Bockstaller and Girardin, 2003, p. 641). To this end, 3S Methodology, consisting of three stages to verify sustainability indicators - sui validatio (self-validation), scienciatis validation (scientific validation) and societatis validatio (social validation) - was introduced by Cloquell-Ballester et al. in 2006. 3S Methodology was used in the design of the Strategic Environmental Assessment (SEA) in Ireland, where chosen indicators were self-validated by the workshop team to ensure appropriateness to the issues in question, scientifically validated through adoption of previously used indicators and expert judgment, and socially validated by the participation of the many stakeholders who ensured the information being relayed was understandable and useful (Donnelly *et al.*, 2007). Another method of indicator validation, called PICABUE, recommends building consensus among key stakeholders on the sustainability definition and principles as the first step prior to a sustainability assessment (Mitchell *et al.*, 1995). There is evidence of similar consensus-building process at the higher education sector. Only after arriving at a consensus of what constitutes a 'sustainable campus', have Cole and her research team proceeded to review 13 sustainability assessment tools to later arrive at creating the Campus Sustainability Assessment Framework (CSAF) (Cole, 2003). In terms of utility, indicators must be practical, meaningful and cost-effective in order to aid the decision-making process regarding sustainability policies, programs, plans and projects (Cloquell-Ballester *et al.*, 2006; Donnelly *et al.*, 2007; Seasons, 2003; Valentin and Spangenberg, 2000). It is therefore important to consider the practical needs of the end-users, link indicators to specific sustainability goals and to ensure the ease of data gathering efforts during the indicator validation stage (Gustavson *et al.*, 1999).

2.3 Sustainability Reporting Tools

Instead of deriving and validating their own sets of sustainability indicators, organizations often opt for the already-developed sustainability reporting tools with standardized indicators included. As mentioned earlier, a diversity of such tools exists, with different emphasis placed on the economic, social and environmental dimensions of sustainable development. Below, selected municipal, corporate and higher education sector reporting tools are detailed.

2.3.1 Municipal Sustainability Reporting Tools

Influenced by their publically visible nature and by the increasingly popular corporate models for sustainability performance measurement and accountability, local governments have began to monitor and evaluate their policies based on economic, social and environmental trends (Seasons, 2003). There is a growing recognition that traditional financial and economic performance measurement is insufficient to understand a community's well-being (Bello, 2006). Thus, a broad range of community-based 'state of the environment', 'quality of life', and 'sustainability' reports have been undertaken in Canada (Pembina Institute, 2002). For example, state-of-environment (SOE) reporting focuses on human activities that affect environmental conditions; 'healthy city' reporting on measuring human health and healthy environments; and 'quality of life' reporting on social and economic conditions in urban areas (Maclaren, 1996a). Popular sources for guidance on municipal sustainability reporting include the Global Reporting Initiative Public Agency Sector Supplement and International Council for Local Environmental Initiatives (ICLEI) publications (CPA Australia, 2007). However, the uptake of the GRI sustainability guidelines has been rather slow in the municipal sector due to the lack of direction on methods of reporting community-based data (Leeson *et al.*, 2006). Furthermore, due to the differences in local planning context and a multitude of interpretations of the term 'sustainable development', there is no consensus on the optimal sustainability assessment approach or measurement tools (Tanguay *et al.*, 2009).

2.3.2 Corporate Sustainability Reporting Tools

Although the focus of the Johannesburg Plan of Implementation was on national, regional and international sustainable development monitoring and evaluation, the enhancement of "corporate environmental and social responsibility and accountability" was also stressed (United Nations, 2002, p. 15). In particular, corporate sector was to:

Improve social and environmental performance through voluntary initiatives, including environmental management systems, codes of conduct, certification and public reporting on environmental and social issues, taking into account such initiatives as the International Organization for Standardization (ISO) standards and Global Reporting Initiative (GRI) guidelines on sustainability reporting, bearing in mind principle 11 of the Rio Declaration on Environment and Development.

United Nations, 2002, p. 15

2.3.2.1 ISO

Established in 1947, ISO has become the world's largest standards developing organization, comprised of national standards institutes from 159 countries. Currently, the most well-known environmental management standard is ISO 14001, which was introduced in 1996 and subsequently implemented by more than 200,000 organizations in 155 countries (International Standards Organization, 2011). In 2011, ISO 26000 was developed, reflecting the importance of evaluating social responsibility performance (International Standards Organization, 2011). Some higher education institutions have adopted the ISO 14001 methods to assess their environmental performance (Fisher, 2003; Price, 2005). However, lack of sector-specific guidelines for higher education institutions was identified as a weakness of the ISO environmental management systems model (Clarke and Kouri, 2009; Taddei-Bringas *et al.*, 2008).

2.3.2.2 GRI

Headquartered in Amsterdam, GRI is a registered not-for-profit organization and a collaborating centre of the United Nations Environment Programme (UNEP). GRI was formed in the United States by the Coalition for Environmentally Responsible Economies (CERES) and Tellus Institute, with support from the UNEP in 1997. It launched the first version of the Sustainability Reporting Guidelines (G1) in 2000, released its second iteration (G2) at the WSSD in 2002 (Global Reporting Initiative, 2007), and is currently at a G3 stage, with the G3.1 version made public in March 2011 (Global Reporting Initiative, 2011a). The growth of sustainability reporting based on GRI guidelines has been steep: from 44 organizations in 2000 to 1,848 in 2010, making it the most widely used sustainability reporting framework in the world (Global Reporting Initiative, 2011b).

In April 2010, the Social Investment Forum (SIF) called for the United States Securities and Exchange Commission (SEC) to demand corporate sustainability reporting based on the GRI guidelines, further illustrating GRI's prominence in the corporate sector (Ioannou and Serafeim,

2011). Higher education institutions however have not been as prompt to adopt GRI: in 2010, only 11 universities have produced sustainability reports using GRI (Global Reporting Initiative, 2011b). While tailored versions of the GRI guidelines, called Sector Supplements, have been developed for electric utilities, financial services, food processing, mining and metals and NGO sectors[1], no special versions were created for the higher education sector. The need for a sector-specific supplement was indentified to account for such unique activities as education and research, carried out at higher education institutions (Lozano, 2011).

2.3.3 Sustainability Reporting Tools for the Higher Education Sector

A number of higher education institutions have already committed to sustainability by signing declarations like the Talloires Declaration in 1990, Halifax Declaration in 1991, the CRE Copernicus Charter and Swansea Declaration in 1993 (Herremans and Allwright, 2000; Wright, 2002). To measure sustainability performance in accordance to the signed declarations these institutions utilize such sustainability assessment tools as the *State of the Campus Environment*, the *Auditing Instrument for Sustainability in Higher Education*, the *Higher Education 21's Sustainability Indicators,* the *Greening Campuses Manual,* the *Campus Sustainability Assessment Framework* (CSAF), and the *Sustainability Tracking, Assessment, & Rating System* (STARS) (Cole, 2003; Shriberg, 2002). The latter two are the most popular: today there are over 260 institutions from the US and Canada participating in STARS (AASHE, 2011a) and 37 Canadian campuses tracking their sustainability performance in accordance to CSAF (Sierra Youth Coalition, 2009a).

2.4 Sustainability Reporting

Sustainability reports explain the data which was collected using one or more sustainability reporting tools, and present relevant performance information to the readers. The rationale for sustainability reporting by each of the municipal, corporate and higher education sectors are presented below.

---

[1] Other Sector Supplements being currently developed are: airport operations, construction and real estate, event organization, media and oil and gas. Also, sector supplements for automotive, logistics and transportation, public agency and telecommunications are available, based on G2 guidelines. A pilot version for apparel and footware sector was developed based on G3 guidelines. http://www.globalreporting.org/ReportingFramework/SectorSupplements/

2.4.1 Municipal Sustainability Reporting

Chapter 28 of Agenda 21 stresses the importance of local governments to carry out sustainability plans and policies:

> Local authorities construct, operate and maintain economic, social and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and subnational environmental policies. As the level of governance closest to the people, they play a vital role in educating, mobilizing and responding to the public to promote sustainable development.
>
> <div align="right">United Nations, 2011c, p. 12</div>

To this end, *Local Agenda 21 Planning Guide*, prepared by the International Council for Local Environmental Initiatives (ICLEI), was created to assist local authorities in sustainable development planning efforts. The guide features a five-step process for sustainable development planning consisting of 1) establishing partnerships; 2) community-based issue analysis; 3) action planning; 4) implementation and monitoring; and 5) evaluation and feedback (ICLEI, 1996). Sustainable development reporting is an integral part of the *Local Agenda 21* evaluation and feedback step. It helps determine whether the planning efforts lead to the desired outcomes and guide citizen action towards sustainability (ICLEI, 1996). According to the guide, an ideal community-based reporting system accomplishes the following:

- Provides a schedule and guidelines for all actors to report to each other. The best guidelines would assure that reports from different parties can be aggregated to determine the joint progress being made to achieve a specific target.
- Establishes a set of indicators to measure performance in achieving targets. (The reporting system should provide the Stakeholder Group or municipal planners with the data needed to determine the present values of these indicators.)
- Provides a periodic opportunity for all actors to meet together to review each others' performances relative to their commitments and targets, and to discuss how to better coordinate their actions.
- Provides an opportunity to expose local residents to the different projects and campaigns being implemented, and to inform them about how they can participate.
- Links the performance reporting process to relevant statutory planning cycles of the municipality, such as annual budgeting, so that the municipality can adjust its plans based on the actions taken by other sectors.

<div align="right">ICLEI, 1996, p. 135</div>

2.4.2 Corporate Sustainability Reporting

A study commissioned by the Canadian government in 2003, found that cost savings due to efficiency improvements, enhanced employee morale and accelerated approval processes were the key reasons for sustainability reporting at the corporate sector (Five Winds International, 2003). A more recent study by SustainAbility, KPMG and Fuerra Sustainability Communications found that 'improving internal processes' and 'accounting for their sustainability performance' were the top two objectives for reporting in 2010 (Futerra Sustainability Communications *et al.*, 2010). Notably, sustainability reporting was considered a proxy for good performance management by ninety-seven percent of report readers. The information in corporate sustainability reports was used to learn about products and services and support investment decisions (Futerra Sustainability Communications *et al.*, 2010).

Moreover, investor pressures to disclose non-financial performance is becoming a significant driver for sustainability reporting in the corporate sector. Material risks to investors from inadequate environmental performance disclosure were identified as an issue in the United States and Canada (Ioannou and Serafeim, 2011; Canadian Securities Administrators, 2010). In February 2010, the *Commission Guidance Regarding Disclosure Related to Climate Change* document was released in the United States, which required companies to disclose material risks relating to climate change (Ioannou and Serafeim, 2011). In October 2010, the Canadian Securities Administrators (CSA) released a similar guidance document, *CSA Staff Notice 51-333,* which stated that "information relating to environmental matters is likely material if a reasonable investor's decision whether or not to buy, sell or hold securities of the issuer would likely be influenced or changed if the information was omitted or misstated" (Canadian Securities Administrators, 2010, p. 5). The *CSA Staff Notice 51-333* stipulated that such information should be disclosed in a meaningful way, and considered by the firm's audit committees, boards and certifying officers in fulfilling their oversight functions. The notice came as a response to the "increasing interest in how environmental matters affect issuers" and stakeholder pressures to disclose non-financial performance through "shareholder resolutions and the issuance of surveys" expressed in Ontario Securities Commission's corporate sustainability reporting investor consultations (Canadian Securities Administrators, 2010, p. 4). In South Africa, the companies listed on the Johannesburg Stock Exchange (JSE) have been required to produce integrated (financial and sustainability) reports or provide explanations for not doing so since 2009. More regulation may be underway, since organizations like the United Nations Principles for

Responsible Investment (UNPRI) call on the world's top stock exchanges to encourage sustainability reporting by listed firms (Ioannou and Serafeim, 2011).

2.4.3 Sustainability Reporting for Higher Education Sector

The role of education in sustainability issues was identified in Chapter 36 of Agenda 21 document that urged the governments around the world to reorient education towards sustainable development, increase public awareness of environmental issues and promote environmental training among educators (Wright, 2002). Higher education institutions are compared to towns or small cities in their size, environmental impact and financial influence (Eagan *et al.*, 2008). Parallels between higher education and corporate sectors are also drawn, as higher education institutions pose significant environmental liabilities by consuming large quantities of energy and water, generating significant volumes of solid wastes and utilizing extensive supply chains (Stafford, 2010). According to David Orr, "no institutions in modern society are better situated and none more obligated to facilitate the transition to a sustainable future than colleges and universities" (Orr, 2004, p. 96). Thus, higher education institutions have a two-fold role in promoting sustainability: through their operations and through delivery of sustainability education in the curriculum (Mathews, 1997; Cortese, 2003; Velazquez *et al.*, 2006). Benefits of sustainability reporting for the higher education sector include better stakeholder communication about sustainability efforts and potential identification of cost savings through performance data analysis (Bardati, 2006). Moreover, some findings suggest that higher education institutions, which embrace sustainability, attract better full-time staff and have higher alumni giving (Stafford, 2010). Competing on better reputation, higher education institutions also engage in sustainability reporting in order to obtain higher rankings in such publications as the Sustainable Endowments Institute's (SEI) *College Sustainability Report Card* (Stafford, 2010). Finally, sustainability reporting can be viewed as an effective Public Relations and marketing tool for higher education institutions, as is the case with corporations (Adams, 2002). Walton summarizes the various benefits of sustainability reporting within the higher education sector:

(i) It supports the development of an environmental policy and provides incentive on its implementation.
(ii) It provides an effective and efficient method for relating performance to policies, objectives and targets throughout the institution.
(iii) It identifies the quality and progress of management internally and externally including the delegation of responsibility and decision making through better management of information.

(iv) It aids the assessment of the availability and quality of institutional environmental information as well as evaluating its applicability and validity.

(v) It assists in identifying potential efficiencies and cost savings and in reducing future environmental liabilities.

(vi) It ensures a point of integration and reference for widely dispersed and independent staff, faculty and students within individual institutions.

(vii) It identifies areas of slow progress which may need separate or more specific policies or action and therefore provides internal comparability with respect to the thoroughness of implementation and specific response to its own environmental policy.

(viii) It makes clear future targets and adds incentive/commitment to reaching them, as a report should include any projects shelved or incomplete; transparency is paramount and honesty about lack of progress in industrial reports has been far better received than expected.

(ix) It facilitates cooperative learning across institutions through information sharing and comparative analysis and enhances credibility in a climate of staff/student scepticism thereby strengthening institutional citizenship.

(x) It develops expertise and information on environmental performance which can support and generate consultancy activities.

(xi) It supposedly provides competitive advantage for institutions in recruiting students and staff and supports research activities.

(xii) It serves to clarify and disseminate environmental information internally and externally to a wide audience and enable fairly accurate comparability amongst similar institutions in a global context.

<div align="right">Walton et al., 1997, p. 200</div>

2.5 Sustainability Reporting Process

Once the decision to report sustainability performance has been made, the various avenues of pursuing the task need to be explored. Which sustainability indicators or assessment tools to use, when should the stakeholders be involved and to what extent – these are some of the questions to be addressed when contemplating the sustainability reporting process.

2.5.1 Municipal Sustainability Reporting Process

Sustainability reporting is viewed as a platform around which the interdependent economic, environmental and social performance of a city may be discussed within the council and the local community (Potts, 2004). City planners are typically responsible for the collection and analysis of sustainability-related data, with the target audience for sustainability reports comprised of elected officials and city staff, and less often of external stakeholders (Farneti and Guthrie, 2009; Seasons, 2003a). In Australia, the *Framework for Public Environmental Reporting* was developed to guide

both private and public entities, including local governments, in their environmental reporting quest. While the eight-step process was originally focused solely on environmental reporting, it is now applicable to sustainability in general (Group of 100, 2003). Three key phases – Plan, Measure, and Report & Review – comprise the process:

Figure 1: The Eight-Step Process to Preparation of a Public Environmental Report (PER)

PHASE 1: Plan:

1) Investigate the rationale for a PER:

- Identify potential benefits and pitfalls in producing a PER
- Identify the scope and coverage of the PER
- Assess costs and benefits and attain top management commitment for producing a PER

2) Identify key stakeholders

- Identify key stakeholders and their needs in a PER both at this initial stage by consultation and at the review stage through feedback mechanisms

PHASE 2: Measure:

3) Identify key environmental aspects

- Identify key environmental issues and resulting significant environmental aspects for reporting purposes

4) Develop environmental performance indicators

- Identify and prioritise relevant environmental (operational and management) performance indicators and environmental condition indicators for reporting purposes

5) Set objectives and targets

- Set appropriate environmental performance objectives and targets including time lines aimed at meeting established commitments for environmental performance

6) Measure and evaluate

- Develop a framework for measurement including data collection, collation and evaluation

---

PHASE 3: Report & Review:

7) Strengthen communicability

- In reporting ensure honesty, clarity, neutrality, credibility, continuity, validity, understandability, relevance, completeness and comparability. Independent verification may also provide additional external assurance to readers

8) Publish, distribute, use and review

- Choose reporting format(s) and period that suits your organisational and stakeholder requirements
- Distribute and use the report appropriately
- Include a feedback mechanism and contact details for feedback, queries and further information
- Review feedback, environmental aspects, environmental indicators, stakeholder needs and objectives and targets

Commonwealth of Australia, 2000, p. 9

The *Framework for Public Environmental Reporting* further suggests possible elements for a report, stressing the importance of "management statement, profile of the reporting organization, the scope of the report and environmental [or sustainability] policy" for the inclusion within a report (Commonwealth of Australia, 2000, p. 28). Focusing more on sustainability indicator selection process, Maclaren, 1996b suggests a similar process for the development of an urban sustainability report:

Figure 2: Urban Sustainability Reporting

1. Defining the urban sustainability goals for which indicators are needed

- If these goals have not been specified already in other planning documents or previous sustainability reports, a community visioning exercise may be deployed
- This means employing a multi-stakeholder, consensus-based approach to identify how a community should appear at some specified future date in order to be regarded as a sustainable community

2. Scoping

- Identifying the target audience and the associated purpose for which the indicators will be used
- Considering the approximate number of indicators that will be needed

- Setting temporal and spatial bounds for the report

3. Choosing an appropriate indicator framework

- Decide on a domain-based, goal-based, sectoral, issue, causal, or a combination framework[2]

4. Defining indicator selection criteria

- Good sustainability indicators are typically those that are: scientifically valid, representative of a broad range of conditions, responsive to change, relevant to the needs of potential users, based on accurate and accessible data, based on data that are available over time, understandable by potential users, comparable with indicators developed in other jurisdictions, cost-effective to collect and use, attractive to the media, and unambiguous

5. Identifying a set of potential indicators

- Refer to sustainability or environmental reports produced by other jurisdictions
- Involve experts who can provide support to the non-expert stakeholder participants
- Use brainstorming sessions in a workshop format or questionnaire surveys of stakeholders in the community to identify potential indicators

6. Evaluating the indicators and selecting a final set

- Assess each of the potential indicators against the selection criteria identified in Step 4 and in the context of the conceptual framework chosen in Step 3

7. Collecting data and analyzing the indicator results

- Determine whether or not the indicator results show that progress is being made towards achieving sustainability
- The value judgments made when evaluating indicator results should be clearly explained in the sustainability report

8. Preparing and presenting the urban sustainability report

- At the very minimum, the report should contain a description of the meaning of each indicator, why it is important, historical trends or anticipated changes, and an evaluation of whether the indicator is showing movement towards or away from sustainability
- Recommendations for improving data collection programs are an important output of the reporting process; policy recommendations may also be included in the report
- Depending on the target audience, report format should be chosen

9. Assessing indicator performance

- Determine whether the indicators performed adequately in measuring what they were meant to measure

---

[2] It is not in the scope of this research to discuss these frameworks in detail. Please refer to Maclaren, 1996b article for an in-depth discussion of sustainability indicator frameworks.

There are benefits of integrating expert-led and top–down and community-based and bottom–up approaches to local sustainability assessments (O'Connor and Spangenberg , 2008; Reed *et al.*, 2006). It is important to establish community control of the process in order to reflect local context and set relevant goals and sustainability priorities (Freebairn and King, 2003). The more diverse the stakeholder group is, "the greater the knowledge of the local peculiarities; the greater the spectrum of sustainable development; the greater the acceptance of the results by the community at large" (Valentin and Spangenberg, 2000, p. 387). Community values and visions of sustainability thus help define policy goals. Experts must be engaged throughout the process to ensure the process is valid and holistic, and to help translate these policy goals into quantifiable targets (Valentin and Spangenberg, 2000). By engaging experts in the early dialogues with community members, local perceptions that have led to current unsustainable practices may be avoided (Reed *et al.*, 2006). Just as important is the inclusion of local and regional council to ensure that sustainability assessment and reporting has an effect on policy development, and that necessary resources are allocated in support (Valentin and Spangenberg, 2000). In particular, support to undertake future sustainability assessments and reporting is needed because as "problems are solved and preferences change, new goals, indicators, and measures have to be found after a number of years that supplement or replace the other" (Valentin and Spangenberg, 2000, p. 388).

2.5.2 Corporate Sustainability Reporting Process

In the corporate sector, sustainability reporting usually takes two forms - either as part of the information contained in the annual reports, or through deployment of stand-alone reports (Bebbington *et al.*, 2008). The allocation of resources and staff dedicated to sustainability reporting varies significantly across organizations, with corporate affairs, corporate communications, corporate social responsibility, or sustainability/environment departments in charge of the reporting process (Adams and Frost, 2008). Stakeholder engagement is the forefront focus in the corporate sector sustainability assessment and reporting process (Adams and Frost, 2008; GRI, 2011; Searcy *et al*., 2008). Typical stakeholder groups consist of shareholders and investors, management, employees, customers, suppliers, communities, government, non-governmental organizations, lenders and general

public (KPMG and Group of 100, 2008). Just how the sustainability reporting had to be linked to overal policy development in the governemntal sector (Ramesteiner *et al.*, 2011; Valentin and Spangenberg, 2000), alignment of sustainability reporting and business strategy to improve overal strategic objectoves and financial perfromance is stressed in the corporate sector (Group of 100, 2003). The following ten-step process reflects these aspects of corporate sustainability, or the triple bottom line (TBL), reporting:

Figure 3: Framework for Evaluating Processes of TBL Reporting

1) Determine which stakeholders should be involved

2) Empower stakeholders to select sustainability performance indicators and to suggest a course of action to improve organization's sustainability performance.

3) Ensure commitment from organization's leaders from the get go.

4) Determine the extent of the sustainability performance evaluation.

5) Include social and equity issues in the analysis.

6) Focus on local sustainability issues. Select indicators that lead to practical actions, using generic sustainability indicator sets such as the GRI Sustainability Guidelines only as a guide.

7) Emphasize a problem-based focus of sustainability reporting, with the stakeholders making suggestions on appropriate actions to enhance sustainability.

9) Create links between the sustainability reporting process and organization's everyday activities.

10) Collaborate with other organizations in achieving sustainability goals.

Adapted from Mitchell *et al.*, 2008 p. 73

2.5.3 Sustainability Reporting Process for the Higher Education Sector

Usually, Campus Sustainability Coordinators are responsible for the organization of sustainability assessments within the higher education sector (Beringer, 2006; Viebahn, 2002) and students are involved in data collection stages (Bardati, 2006; Ferreira *et al.,* 2006; Helferty & Clarke, 2009; Mitchell, 2011; Wells *et al*., 2009). Sustainability committees comprised of senior administration, faculty members, support staff and students communicate assessment findings into institutional decision-making (Bardati, 2006; Beringer, 2006). Institutions that are considered leaders

in sustainability hire full-time personnel to co-ordinate sustainability efforts and report on the progress to senior governing bodies (Herremans and Allwright, 2000). Inherent in their success are the establishment of sustainability principles, selection of few, yet effective indicators, and clear communication of results through organized reporting structure (Troschinetz *et al.*, 2007).

Generally, the literature does not provide practical guidance for the development of sustainability reports within the higher education sector. While Bardati's three-stage process of environmental assessment outlines possible steps prior to the report creation, the focus of her discussion remains on the environmental audit course structure (Bardati, 2006). Viebahn's environmental management model for universities provides broader insight into the set up of environmental management systems, with only a brief discussion on reporting (Viebahn, 2002). A recent student paper titled *Developing an Annual Sustainability Report for WPI* shares the authors' experience in writing the first-ever sustainability report for Worcester Polytechnic Institute (Alden *et al.*, 2010). The authors considered the GRI and STARS approaches to reporting on sustainability, examined the contents of nine higher education sector sustainability reports to determine key features and reporting structures, interviewed the institute's staff and faculty to obtain relevant data, and presented the final report online (Alden *et al.*, 2010). While some good insight can be obtained from this work, a clear step-by-step process was not provided. This thesis addresses the issue by sharing the experience of creating the first-ever sustainable development report at the University of Waterloo. The seven-step process proposed in the Results chapter can aid other universities considering sustainability reporting for the first time.

2.6 Sustainability within the Planning Practice

Sustainable development has gained significant attention in planning literature (Berke et al., 2000; Bunting et al., 2010; Maclaren, 1996; Seasons, 2003; Wheeler, 2004). Influential planning thinkers like Ebenezer Howard, Lewis Mumford, Kevin Lynch, Jane Jacobs and Andres Duany have advocated for various aspects of sustainability to be incorporated in urban development and city planning (Bunting et al., 2010; Wheeler, 2004). More recently, sustainable development has been identified as an emerging planning paradigm:

> The call for the development of new sustainable forms of urban development and the retrofitting of urban environments to reduce ecological 'footprints' and render them more 'environmentally-friendly' is a late twentieth-century and early twenty-first century

awakening... This recent awakening, on the part of scholars, planners, politicians, and the residents of urban environments, also helps to explain the huge nature of change being called for (and witnessed) at present in the relationships between cities and the biophysical environment.

<div align="right">Bunting et al., 2010, p.2</div>

Illustrating this transition, many Canadian cities initiated sustainability projects and committed to smart growth and mixed-use development plans (Grant and Filion, 2010). To this end, a variety of sustainability tools has been developed to aid communities in sustainability planning, including the afore-mentioned Local Agenda 21 Planning Guide (ICLEI, 1996) the Natural Step Framework (James and Lahti, 2004), and the Integrated Community Sustainability Planning Tool (Ling et al., 2007).Today, these tools are used in conjunction with the 'rational-comprehensive' and 'participatory and communicative' models for sustainable community planning (Connelly and Roseland, 2010).

The 'rational-comprehensive model' consists of setting goals, identifying alternatives, deciding on the preferred approach, implementing plans, and monitoring and evaluating outcomes (Hudson, 1979; Seasons, 2003). The 'participatory and communicative model' stresses the importance of public participation in the planning process (Connelly and Roseland, 2010) and prescribes planners to act as the 'facilitators' of multi-stakeholder discussions, as the 'educators' of public and as the 'visionaries' who inspire sustainability action (Wheeler, 2004). Thus, the role of sustainable development reporting in the field of planning is two-fold: to track sustainability performance as part of the monitoring and evaluation step of the 'rational-comprehensive model' (Season, 2003) and to communicate with the community members as part of the 'participatory and communicative model' (Robert et al., 2002). Thus, my work on the design of the seven-step process for first-time sustainability report development profiled in this Thesis is consistent with the planning practice.

Chapter 3
Methodology

This chapter profiles methods employed to create the *University of Waterloo Sustainable Development Report 2010*. It begins with an introduction of grounded theory and action research concepts and explains ways that this thesis exhibits elements of these methodologies. The site selection section then provides details about the University of Waterloo and the impetus for the *University of Waterloo Sustainable Development Report 2010* development. Discussion of the preliminary research steps, data collection and data verification follows. The chapter concludes with an explanation of how ethical considerations were taken into account during the research. The following two research questions (RQ) were central to the empirical research inquiry of this thesis:

RQ1. What is the process for developing a first-time sustainability report for a higher education institution?

RQ2. What content should a sustainable development report for a higher education institution include and what should its format be?

3.1 Grounded Theory

Grounded theory was developed by Barney Glaser and Anselm Strauss in 1960's, who advocated for new theory generation through inductive thinking about empirical data, or "discovering theory from data" (Glaser & Strauss, 1967, p. 1). Rather than testing existing theories, I applied systematic qualitative procedures to examine the complexity of ways in which the variables of the considered case interact. The process of building grounded theory consists of data collection, analysis, comparing to existing literature, building theory, and then planning what to study next. The findings from one case are confirmed through an examination of a few more comparative cases to establish credibility of the research (Glaser & Strauss, 1967).

This thesis exhibits some of the main grounded theory tenets. First, just as "the aim of grounded theory is to generate or discover theory" (Dey, 1999, p. 1), the aim of this thesis is to generate theory about the process for the first-time sustainability report development within the higher education sector. Second, grounded theory is "derived from data acquired through fieldwork interviews, observations, and documents" (Dey, 1999, p. 1). The researcher selects participants who

best help the researcher understand the research question and address his or her initial findings (Creswell, 2009). Indeed, the majority of data for the *University of Waterloo Sustainable Development Report 2010* was obtained through face-to-face interviews and public documents. Third, grounded theory calls for purposeful sampling, or for an in-depth study of information-rich cases that can uncover a "great deal about issues of central importance" to the inquiry (Patton, 2002, p. 230). In particular, a 'critical case' approach to theory generation was employed in this thesis:

> A clue to the existence of critical case is a statement to the effect that 'if it happens there, it will happen anywhere… While critical case sampling does not permit broad generalizations to all possible cases, logical generalizations can often be made from the weight of evidence produced in studying a single, critical case… There are no rules for sample size in qualitative inquiry… The validity, meaningfulness, and insights generated have to do more with the information richness of the cases selected and the observational/analytical capabilities of the researcher than with sample size.
>
> <div align="right">Patton, 2002, p. 236</div>

Indeed, practitioners at peer institutions may draw from the University of Waterloo experience when undertaking sustainability reporting for the first time. Finally, "the resulting theory can be reported in a narrative framework or as a set of propositions" (Dey, 1999, p. 2). Such framework, or the seven-step process for first-time sustainability report development at the higher education sector, is the outcome of this thesis.

3.2 Action Research

The term 'action research' was coined by Kurt Lewin, in his 1946 paper called *Action Research and Minority Problems* (Lewin, 1946). According to Lewin, action research is "a comparative research on the conditions and effects of various forms of social action and research leading to social action" (Lewin, 1946, p. 35). This 'learning by doing' approach argues that "theory can and should be generated through practice" (Brydon-Miller *et al.*, 2003, p. 15). According to Kemmis and McTaggart, "much of action research insists that the practitioner can be a researcher, with or without specialized training, and that research conducted within – not just on – practice can yield evidence and insights that can and do assist in the critical transformation of practice" (Kemmis and McTaggart, 2003, p. 377). The four main stages of action research are planning, acting, observing and reflecting (Kemmis and McTaggart, 2003), or identifying the research question(s), gathering the information to answer the question(s), analyzing and interpreting the information, and sharing the results with participants (Berg, 2004). The methodology employed in the development of the

University of Waterloo Sustainable Development Report 2010 is consistent with action research process.

3.3 Site Selection

Since its creation in 1957, the University of Waterloo has become one of Canada's leading comprehensive universities. It is now home to 30,000 students and the largest post-secondary co-operative education program in the world. The University of Waterloo was named Canada's most innovative university in the Maclean's annual university rankings for 19 years in a row since 1991 and the Faculty of Environment is the oldest faculty of its kind nation-wide (University of Waterloo, 2011). In terms of sustainability education, the environment and business undergraduate program offered at the Faculty of Environment has been ranked number one in the country for three years in a row since 2008 by Corporate Knights magazine (Waterloo Environment, 2010).

In 2009, the University of Waterloo signed the Council of Ontario Universities (COU) sustainability pledge, titled *Ontario Universities: Committed to a Greener World* (University of Waterloo Daily Bulletin, 2009). The pledge committed the university to "to assist in finding solutions to the challenges of environmental sustainability; to share knowledge about sustainability and climate change; and to incorporate, wherever possible, principles of sustainability into our own operations" (COU, 2009, p.1). The creation of the *University of Waterloo Sustainable Development Report 2010* was determined to aid the university in fulfilling the *Ontario Universities: Committed to a Greener World* pledge. Thus, the University of Waterloo Faculty of Environment Dean's Advisory Council spearheaded this initiative and selected me to carry out the task.

In context of grounded theory and action research, the University of Waterloo main campus was a suitable site. First, the *University of Waterloo Sustainable Development Report 2010* became the first official sustainable development report on behalf of the institution. The university served as an information-rich case to investigate the intricacies of sustainability reporting in a higher education institution that does not have an official sustainability plan, policy, goals and a sustainability coordinator. Second, I completed five years of undergraduate education at the University of Waterloo, got familiar with the organizational structure of the institution and could identify best avenues to gain support for the initiative. Third, the university staff whom I collaborated with to gather data for the

report, acted as deliberate and contributing actors in the report creation. This was achieved through empowering staff to make decisions on the information to be included in the report and verifying the accuracy of this information and staff viewpoints prior to the report release.

3.4 Preliminary Steps

To develop the *University of Waterloo Sustainable Development Report 2010*, I undertook four preliminary steps prior to data collection and data verification:

1) *Review higher education sector sustainability reports.* The aim of this step was to determine key components of a sound sustainability report. To this end, I reviewed 17 sustainability reports prepared by higher education institutions.
2) *Review higher education sector sustainability assessment tools.* The aim of this step was to identify most commonly reported performance indicators. While there were many sustainability assessment tools available for comparison, GRI, STARS and CSAF were selected, representing the preferred choice across comparable higher education institutions (Fonseca *et al.*, 2010).
3) *Develop a draft 'sustainable development' definition and associated guiding principles in the University of Waterloo context.* The aim of this stage was to determine the university's key stakeholder groups and key sustainability performance areas. The draft sustainable development definition and guiding principles were reviewed by my two supervisors and put together in a document called *Our Path Forward Draft 1* (Appendix A). The document was distributed to the Sustainable Development Advisory Committee prior to the workshop discussion in Step 4 (below).
4) *Engage the Stakeholders.* The aim of this step was to finalize the University of Waterloo sustainable development definition and the associated guiding principles contained in the *Our Path Forward Draft 1* document. A multi-disciplinary stakeholder group, called Sustainable Development Advisory Committee, assembled in a workshop setting to conceptualize the report, obtain subject-matter expert advice, and capture core values of the university (Donnelly *et al.*, 2007; Mitchell *et al.*, 1995). Please see Appendix B for *Our Path Forward Draft 2*, which reflects the suggestions made by the Sustainable Development Advisory Committee. According to Stafford, "the specification of a particular institution's value function will depend on the underlying preferences of many individuals including the institution's governing board, its administration, alumni and donors, faculty, and students" (Stafford, 2010). Similarly, in a workshop scenario, "it is best to work with a group that reflects the diversity of the community" (Valentin and Spangenberg, 2000, p.385). Therefore, it is important to consider who the institution's main stakeholders are in order to ensure that the information communicated in a sustainability report is reflective of the values of the institution and is relevant to their decision-making.

The Results Chapter provides greater insight into each one of these four steps. Please see Appendix C, or the welcoming e-mail sent out to the Sustainable Development Advisory Committee members.

3.5 Data Collection

Once the final draft of *Our Path Forward* was completed, I had a framework regarding data needed to assess sustainable development performance in each of the key performance areas associated with the guiding principles. Purposeful sampling was therefore employed to collect needed data. I decided to conduct in-depth face-to-face interviews with the university staff responsible for each of the key sustainable development performance areas identified. My familiarity with the university helped identify these individuals. Where I was not sure about who to contact, I asked for recommendations and referrals from the staff she had already formed relationships with, or allowing the interviews to 'snowball.' Snowball sampling strategy was used during the interview process to "identify case of interest from sampling people who know good interview participants" (Patton, 2002, p. 243). The use of purposeful sampling and snowball sampling strategy were justified, as I relied on expert opinion of the university staff members to convey the most relevant information to the report. The staff members were also able to refer me to best sources for data collection and other individuals, who would be the most knowledgeable on topics of interest. Thus, I benefitted from staff's extensive expertise and their established relationships at the university.

In addition, I referred to publically available documents published by the university and that had been verified for accuracy either by the university staff or by external auditors. The documents chosen were the Annual Performance Indicators report and audited Financial Statements reports available online (University of Waterloo, 2010). I also used Maclean's magazine annual *Guide to Canadian Universities* publications to track student-engagement related information for the purposes of the report (Maclean's, 2010; Maclean's, 2009; Maclean's, 2008).

3.5.1 Qualitative Interviewing

There are three basic types of qualitative interviewing: the informal conversational interview that relies entirely on spontaneous generation of questions and natural flow of interaction; the general interview guide approach that involves outlining a set of issues to be explored and using that outline

as a checklist during the interview; and the standardized open-ended interviews, consisting of carefully worded questions to ensure each interviewee is asked the questions with the same words for a consistency (Patton, 2002). Among the merits of conducting face-to-face interviews are their high response rates and ability for longer and more in-depth discussions than with other forms of questionnaires (Neuman, 2007). I chose the general interview guide approach to create room for spontaneous conversation and make sure the focus on the particular subject was maintained. The set of questions to be discussed during the interview was usually shared with the interviewee prior to the interview, to allow the interviewee time to prepare. Please see Appendix D for a sample email used to approach staff members, Appendix E for the general interview guide, and Appendix F for list of departments that participated in the interviews.

3.6 Data Verification

Ensuring data accuracy was instrumental to establishing the credibility of the *University of Waterloo Sustainable Development Report 2010*. Validity is based on "determining whether the findings are accurate from the standpoint of the researcher, the participant, or the readers of the account" (Creswell, 2008, p. 191). Creswell indicated that there are eight primary strategies to check the accuracy of the findings:

1. Triangulate different data sources of information.
2. Use member-checking to determine the accuracy of the qualitative findings.
3. Use rich, thick description to convey the meanings.
4. Clarify the bias the researcher brings to the study.
5. Also present negative or discrepant information that runs counter to the themes.
6. Spend prolonged time in the field.
7. Use peer debriefing to enhance the accuracy of the account.
8. Use an external auditor to review the entire project.

Creswell, 2008, p. 191

I used member-checking and peer-debriefing strategies (Creswell, 2008). Member-checking occurred when I provided all interview participants with sections of the report draft where their input was used to obtain feedback and ensure accuracy of the information. Peer debriefing was exercised upon the completion of the first draft of the report. Members of the Sustainable Development

Advisory Committee and three independent readers reviewed the report and provided feedback and editions.

Reliability is as the ability of the research to be replicated in a different setting with similar results (Babbie, 2003). If one had to compare sustainability reports to arrive at their key structural components and to compare common sustainability performance indicators from the GRI, STARS and CSAF sustainability assessment tools, they would most likely arrive at my conclusions discussed in the Results Chapter. Moreover, due to similarities in both organizational structure and operations of higher education institutions, their key stakeholder groups (students, alumni, employees and community members) and the key sustainability performance areas are also analogous. However, since cultures, sustainability values and priorities vary for each situation, the proposed seven-step process will lead to unique results.

3.7 Ethical Considerations

The initiative to develop the *University of Waterloo Sustainable Development Report 2010* originated at the Faculty of Environment Dean's Office and was approved by the Dean's Advisory Council in the summer of 2010. The University of Waterloo Office of Research Ethics exempted the initiative from a standard ethics review process since I was originally hired on contract by the Faculty of Environment Dean's Office to conduct the study. Nevertheless, I went through a rigorous process to prevent any ethical issues from arising.

First, I made sure to identify her role at the university, to mention Faculty of Environment as originator of the initiative, to provide background on the project, to specify the information being sought and to share the my contact information whenever I approached a staff member during the data collection stage.

Second, I tried to make the process of data collection as convenient to the interviewees as possible. I was flexible to conduct interviews on the phone or to visit the interviewees at the locations convenient for them (usually the individuals' offices). I was flexible to accommodate the times preferred by the interviewees to minimize disruption in flow of their daily activities.

Third, I conveyed the benefits of sustainable development reporting to the interviewed staff to create an understanding of reciprocity in the process.

Finally, I sought both positive and negative stories to ensure transparent reporting and enhance credibility of the report (Adams, 2002; Blackburn, 2007).

Chapter 4

Results –Part A

To answer the first research question (*What is the process for developing a first-time sustainability report for a higher education institution?)* this chapter illustrates a seven-step process used in the creation of the *University of Waterloo Sustainable Development Report 2010*:

1. Review higher education sector sustainability reports
2. Review higher education sector sustainability assessment tools
3. Develop a draft 'sustainable development' definition and associated guiding principles
4. Engage the Stakeholders
5. Collect sustainability performance information
6. Verify report accuracy
7. Publish the report and welcome feedback

Chapter 5 addresses the second research question (*What content should a sustainable development report for a higher education institution include and what should its format be?)* and profiles the *University of Waterloo Sustainable Development Report 2010* contents.

4.1 Step 1: Review Higher Education Sector Sustainability Reports

In order to understand what constitutes a superior sustainability report structure, I reviewed seven sustainability reports prepared by Canada's largest universities (Fonseca *et al.*, 2010) and a random sample of ten sustainability reports from other colleges and universities. The following components were identified as integral to a well-designed sustainability report:

1. Title page
2. Message from the president
3. Table of contents
4. Introduction to the report, including its purpose, reporting period and scope
5. List of guiding principles and key performance areas being reported on
6. Executive summary of findings
7. Sustainability performance analysis
8. Conclusion and recommendations
9. Appendix
10. Contact information of a person/office to address report inquires

I ensured that the *University of Waterloo Sustainable Development Report 2010* contained each of these ten components.

4.2 Step 2: Review CSAF, STARS and GRI Sustainability Assessment Tools

To determine the most commonly-suggested sustainability performance measurements for the higher education sector, I analyzed lists of core indicators from the GRI 3.0 Sustainability Reporting Guidelines, as well as STARS and CSAF (AASHE, 2011b; Global Reporting Initiative, 2006; Lozano, 2011; Sierra Youth Coalition, 2009b) sustainability assessment tools. Since GRI has not developed a Sector Supplement for higher education institutions, I reviewed Lozano's GRI modification for universities to account for the "academe" dimension of sustainability performance (Lozano, 2011). The table below identifies key sustainability indicators for the four main dimensions of sustainability performance at a higher education institution - environment, society, economy and academe. In deriving this table, I looked for the recurring themes across the CSAF, STARS and GRI sustainability assessment tools. Where such themes were identified, for at least two of the tools, the item was added to the table. There were two exceptions, the 'Employee Injury and Severity Rates' and 'Economic Value Generated' indicators occurred only in the GRI 3.0 Sustainability Reporting Guidelines. I deemed these two indicators as two important omissions from the other two sustainability assessment tools because of the central role these two items occupy within sustainability reports. The Table`s last column illustrates which indicators were addressed in the *University of Waterloo Sustainable Development Report 2010*.

Table 1: Key Sustainability Indicators from CSAF, STARS and GRI

	CSAF	STARS	GRI	Addressed?
1. Environment				
• Energy Consumption	■	■	■	Yes
• Water Consumption	■	■	■	Yes
• Wastewater Discharge	■		■	Yes
• Biodiversity/Habitat/Green Spaces	■		■	Yes
• Pesticide Use	■	■		Yes

	CSAF	STARS	GRI	Addressed?
• LEED Certified Buildings	■	■		Yes
• Waste and Recyclables Produced	■	■	■	Yes
• Office Paper Consumption	■	■		Yes
• Greenhouse Gas Emissions	■	■	■	Yes
	CSAF	**STARS**	**GRI**	**Addressed?**
2. Society				
• Employee Injury and Severity Rates			■	Yes
• Gender, Age, Persons with Disabilities and Indigenous Groups	■	■	■	Yes
• Student, Staff and Faculty Sustainability Training	■	■		N/A
• Community Outreach Programs		■	■	Yes
3. Economy:				
• Economic Value Generated			■	Yes
• Socially Responsible Investment	■	■		Yes
• Purchasing Considerations	■	■	■	Yes
4. Academe:				
• Sustainability-Related Courses	■	■	■	No
• Sustainability-Focused Research	■	■	■	Yes

In addition to these key sustainability indicators, the *University of Waterloo Sustainable Development Report 2010* assessed student health issues by tracking number of student visits to the on-campus clinic, included information on fundraising efforts, research grants, pension and endowment fund management, and profiled student engagement performance (please see next chapter for detailed report contents). While the table above indicates the importance of tracking sustainability-related courses, I did not have the resources to create such a database.

It is also important to note that all three sustainability assessment tools analyzed stress the importance of reporting on sustainability commitments, including an institution's sustainability policies and plans. These items were not included in the table above because they do not directly

relate to sustainability indicator selection, but to recognizing sustainability within the organizational structure of an institution. Please see Appendix G for a more in-depth comparison of the CSAF, STARS and GRI sustainability indicators.

4.3 Step 3: Develop a Draft 'Sustainable Development' Definition and Associated Guiding Principles

Upon reviewing the 17 sustainability reports, as well as the CSAF, STARS and GRI sustainability assessment tools, I realized the importance of developing a definition of 'sustainable development' appropriate to the University of Waterloo setting. This entailed identifying the university's key stakeholders and parameters of sustainability applicable to its operations and activities. Once the definition was drafted, I and my two supervisors produced a set of guiding principles against which to assess the university's sustainable development performance. The creation of these guiding principles was driven primarily by the findings from the CSAF, STARS and GRI indicator comparison. The wording of the guiding principles suggested which key sustainable development performance areas would be addressed in the report, thus aiding with sustainability indicators selection. Please see Appendix A for *Our Path Forward Draft 1* containing the draft sustainable development definition and associated guiding principles.

4.4 Step 4: Engage the Stakeholders

The aim of this step was to draw on the University of Waterloo stakeholder values and on the sustainability subject-matter experts' practical knowledge of the field when finalizing the sustainable development definition and associated guiding principles. To this end, a Sustainable Development Advisory Committee was formed and a workshop-format was chosen to allow for a dynamic discussion and a real-time consensus building on the University of Waterloo's sustainable development definition and guiding principles. The size of the Sustainable Development Advisory Committee had to remain small to ensure a quality discussion. Thus, a multi-disciplinary team of 11 people comprised of subject-matter experts from private, public and NGO sectors, university professors and undergraduate and graduate student representatives were called for the consultation:

- Amelia Clarke, *Assistant Professor*, Faculty of Environment, University of Waterloo
- Ashlea Hegedus-Viola, *Undergraduate Student*, University of Waterloo

33

- Blair Feltmate, *Associate Professor,* Faculty of Environment, University of Waterloo
- Danielle Avila, *Coordinator*, University of Waterloo Sustainability Project
- David Roewade, *Environmental Sustainability Planner,* Region of Waterloo
- Jonathan Pinto, *Master's Student*, University of Waterloo
- Mike Morrice, *Executive Director*, Sustainable Waterloo
- Nelson Switzer, *President and Chief Sustainability Officer*, Asherleaf Consulting Inc.
- Peter Johnson, *Corporate Consultant*, Johnson and Associates
- Sandi Stride, *President and CEO*, EcoStride Group

Literature stresses the importance of ensuring that performance indicators are linked to concrete organizational objectives and are relevant to senior decision-makers (Donnelly *et al.*, 2007; Gustavson *et al.*, 1999; Rametsteiner *et al*., 2011; Wilson *et al.*, 2007). Thus, early involvement of senior university administration, who are in a position to financially or administratively support sustainability initiatives within a higher education institution, is crucial.

I understood the merits of including the University of Waterloo senior administration in the workshop discussion. However, the workshop was held at the infant stage of the project, during which there was no formal support for sustainability reporting initiative on behalf of the university. Strategically, I decided to first indentify which sustainability performance information I would need to collect for the report (one of the outcomes of the workshop) and ensure the support of the project from the university staff responsible for tracking sustainability information, prior to approaching senior administration and inquiring their input. Notably, if the initiative for sustainability reporting was formal, the inclusion of senior administrative staff in the stakeholder discussions would occur during the workshop step.

4.4.1 Sustainable Development Advisory Committee Workshop Format and Outcomes

The workshop was held over a five-hour period on November 3, 2010 at the University of Waterloo main campus. Each Sustainable Development Advisory Committee member received a copy of the *Our Path Forward Draft 1* document, was notified about the type of input sought from them, and was provided with an agenda of the workshop (please see Appendix C for the Sustainable Development Advisory Committee invitation email and the workshop agenda).

Introductions started the workshop. During the first hour, I presented the rationale behind the *University of Waterloo Sustainable Development Report 2010* creation, conveyed findings from the review of other higher education sustainability reports and the common indicators from the CSAF, STARS and GRI sustainability assessment tools. The ideas behind the draft sustainable development definition and associated guiding principles contained in the *Our Path Forward Draft 1* document were also explained.

The remaining four hours were spent in a guided discussion on the sustainable development definition, the associated guiding principles, and key performance areas. Time for less formal conversations was allocated during the lunch break. My role consisted of time-keeping and consensus-building among the Sustainable Development Advisory Committee members. I took real-time notes on the recommendations about the wording of sustainable development definition and guiding principles. These notes were displayed on a projection screen to allow for cross-examination by the committee members.

At the end of the workshop, consensus was reached on the key words to be included in the sustainable development definition. The Sustainable Development Advisory Committee members further agreed to limit the number of guiding principles to four, as opposed to seven proposed originally. Similarly, the committee urged me to focus data collection efforts on key sustainability performance indicators.

A week after the workshop occurred, I created *Our Path Forward Draft 2* document and emailed it to the Sustainable Development Advisory Committee members for any final comments. The message from the President section found on the page two of the *University of Waterloo Sustainable Development Report 2010* encompasses the recommendations originated at the workshop. Please refer to Appendix I for the *University of Waterloo Sustainable Development Report 2010*.

4.5 Step 5: Collect Sustainability Performance Information

Since the *University of Waterloo Sustainable Development Report 2010* was the first report of its kind produced at the university, I collected sustainability performance information for a five year period to determine trends. Where applicable, I set 2006 calendar year, or 2005/2006 fiscal year as the

sustainability performance benchmark. Please refer to 'Data Collection' section in chapter three for more details about the process of obtaining this data. Please note that chapter five profiles the contents of the *University of Waterloo Sustainable Development Report 2010*, which are a result of the data collection step.

4.6 Step 6: Verify Report Accuracy

Every section of the *University of Waterloo Sustainable Development Report 2010* was verified by the staff and faculty members who provided relevant information. Additionally, the entire report was reviewed by the Sustainable Development Advisory Committee members to provide any high-level recommendations. Similarly, my two supervisors and three other independent readers reviewed the report and provided feedback. The report was then edited by a technical writer to ensure proper grammar and punctuation and by the University of Waterloo Communications and Public Affairs personnel.

I also relied on the information obtained from publically-available sources to be accurate and trustworthy. Please see 'Data Verification' section in Methodology chapter for data verification details.

4.7 Step 7: Publish the Report and Welcome Feedback

The *University of Waterloo Sustainable Development Report 2010* was written to create awareness about sustainability performance on the main campus among the university's key stakeholders – current and prospective students, staff, faculty, administration, alumni and community members. The report was made available online at the University of Waterloo Public Accountability http://uwaterloo.ca/accountability/ and Sustainability http://www.sustainability.uwaterloo.ca/ web pages on August 3, 2011. A news article announcing the release of the report was published on August 8, 2011 http://www.bulletin.uwaterloo.ca/2011/aug/08mo.html (please see Appendix H). To minimize its potential environmental footprint, only a minimal amount of report copies will printed for the Board of Governors meeting and other relevant events at the university. These copies will be printed dryographically, on 100 per cent recycled paper, certified by the Forest Stewardship Council of Canada.

Chapter 5

Results – Part B

This chapter addresses the second research question:

What content should a sustainable development report for a higher education institution include and what should its format be?

To answer the first part of this question, the *University of Waterloo Sustainable Development Report 2010* contents are presented below. These contents were obtained using the data collection methods discussed in chapter three and are organized in four main sections as per report's guiding principles: environmental responsibility, social leadership, economic health and academic excellence. The final formatted version of the report, which includes all of these contents along with introductory pages and Future Directions section, is available in Appendix I. The rationale behind the chosen format of the report is provided at the end of this chapter.

5.1 Environment Responsibility Section

This section of the *University of Waterloo Sustainable Development Report 2010* addresses energy and water consumption, land use, waste management and CO_2 emissions topics. Majority of the data was obtained through qualitative interviewing with the University of Waterloo Plant Operations staff. Other departments engaged were Procurement and Contract Services, St Paul's and St Grebel's University Colleges, Faculty of Applied Health Sciences – Computing and Faculty of Environment – Mapping, Analysis and Design.

5.1.1 Energy

Annual energy consumption at the University of Waterloo main campus rose 14 per cent over 2005/06 and 2009/10 fiscal years (Figure 4). However, nearly 89,000 m^2 of new building space requiring heating and cooling was added over the same period. On a per m^2 basis, three per cent less energy was used to heat and cool university buildings in the 2009/10 fiscal year when compared to 2005/06 (Figure 5). University of Waterloo Plant Operations attributes this performance to the following:

- An advanced building automation system, which allows for real-time adjustments to the ventilation and temperature in buildings based on room occupancy
- A heat recovery system at the central utilities plant, which captures the heat that otherwise would be vented up the stack and uses it to reduce the overall energy use of the steam plant
- Ongoing campus-wide energy retrofits, which include energy-efficient lighting fixture installations and air conditioning systems upgrades
- Requirement that all newly constructed buildings conform to the Leadership in Energy & Environmental Design (LEED)[3] silver standard for mechanical and electric systems

Figure 4: University of Waterloo Annual Energy Consumption (Main Campus)

---
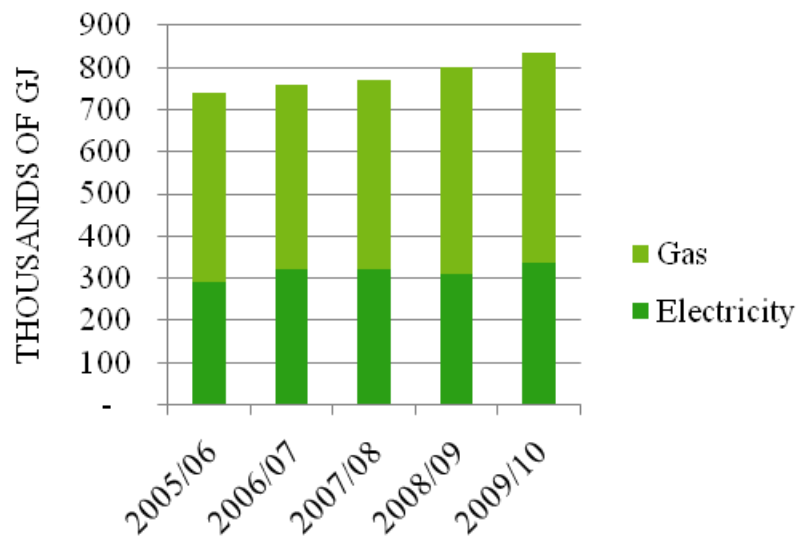
[3] Leadership in Energy and Environmental Design (LEED) is a globally recognized building certification system. Administered by the Canada Green Building Council (CaGBC), the system assesses how well the building measures up in terms of sustainable site development, water efficiency, energy efficiency, choice of materials and indoor environmental quality, as well as "innovation and design process." There are four levels of certification: certified, silver, gold and platinum.

Figure 5: University of Waterloo Annual Energy Consumption per m² (Main Campus)
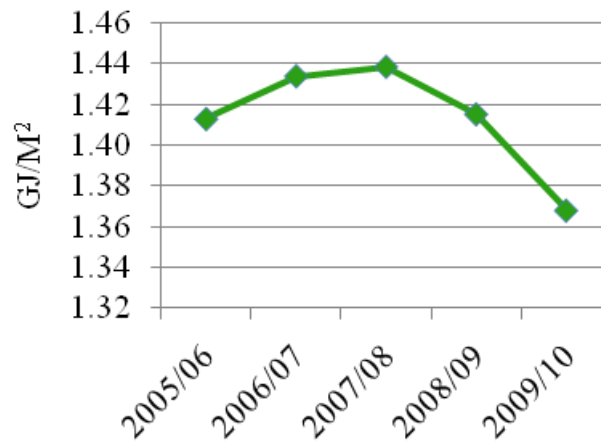
5.1.1.1 Energy Metering

Individual building energy metering has been implemented at St. Jerome's University and Conrad Grebel, Renison, and St. Paul's university colleges located on the University of Waterloo main campus. Individual building energy metering helps monitor energy efficiency improvements and makes residence energy reduction competitions possible across these institutions.

5.1.1.2 Ring Road Lighting Retrofit

To further reduce energy consumption on the University of Waterloo main campus, a retrofit to the lighting system along the Ring Road was initiated in 2010. All 150-watt high-pressure sodium lights that circle 2.65 km of main campus along the Ring Road will be replaced by more efficient 70-watt induction lights. When completed in 2011, the retrofit will not only save energy, but will also result in a better-quality white light along the Ring Road.

5.1.1.3 CASE 1: Solar Grebel

In December 2010, three thermal solar arrays were installed on the roof of Conrad Grebel University College to preheat its domestic hot water supply (see photo to the right).
A student-led group called Solar Grebel spearheaded this initiative. The students gained valuable experience from ensuring the support of Grebel administrators for the project, researching the idea,

writing the Request-for-Proposals, selecting a supplier of the water heating system, and applying for grants. The three panels will produce the equivalent of 7.8 megawatt hours of energy, which will lead to savings of 940 cubic metres of gas annually - about 14 per cent of Grebel's current load. Additionally, Grebel's CO_2 emissions will be reduced by 1,981 kilograms per year.

5.1.2 Water

The University of Waterloo's annual water consumption on main campus has declined by 35 per cent between the 2005/06 and 2009/10 fiscal years (Figure 6). The following factors explain this trend:

- Ongoing campus-wide water retrofits, which include water-saving fixture installations
- Closed-loop re-circulating systems in the cooling towers and laboratories
- Biology 1 fish laboratory retrofit in 2008, which resulted in average annual water savings of 19,000 m^3

5.1.2.1 Water Metering

Individual building water metering has been implemented at St. Jerome's University and Conrad Grebel, Renison, and St. Paul's university colleges at the University of Waterloo main campus. Individual building water metering could be instrumental going forward to monitor individual water conservation efforts.

Figure 6: University of Waterloo Annual Water Consumption (Main Campus)[4]
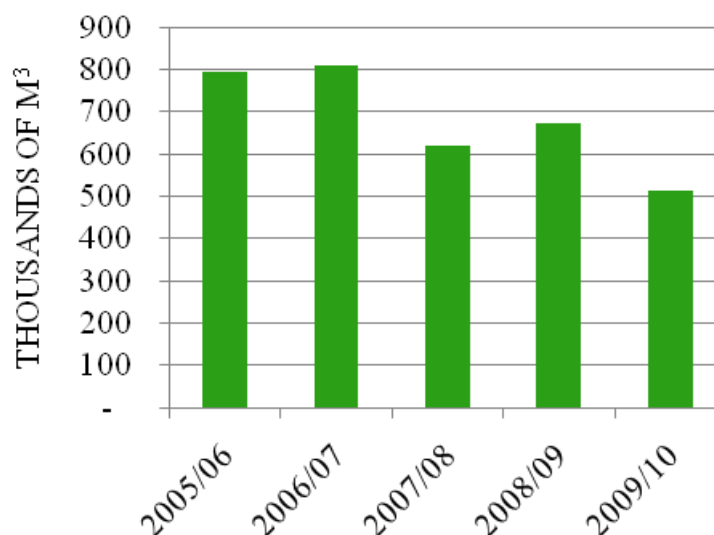
5.1.3 Land Use

5.1.3.1 The University of Waterloo Main Campus

The University of Waterloo has a total of 1,100 acres in land holdings, with the majority of academic buildings, residences and administrative offices concentrated on the 300-acre south portion of the main campus. The University of Waterloo Campus Master Plan illustrates the university's commitment to sustainable land use. The plan was updated in 2009 to provide direction on ways to accommodate new growth while preserving, enhancing, and expanding the quality and integrity of campus and its natural environment.

The main campus boasts such environmental features as Laurel Creek, perennial gardens, and abundant natural green spaces. All new trees and shrubs planted on the main campus are species native to southern Ontario. To protect natural habitats from harmful chemicals, cosmetic pesticides are no longer used on university property, except for occasional applications on sports fields. Aeration, irrigation and fertilization ensure healthy turf and a hot-water spray system is used to eliminate weeds from the university's sidewalks, parking lots and roads.

---

[4] The university assumes the amount of waste water discharged is equivalent to the amount of water consumed as per Figure 7.

5.1.3.2 David Johnston Research and Technology Park

Named after the university's former president, the David Johnston Research and Technology Park is one of the newest research parks in Canada. Located in the northern portion of the main campus, the Research and Technology Park was designed to accommodate 1.2 million square feet of office space on a 120-acre lot. Enterprises like Sybase, Open Text Corporation, and AGFA, as well as the Accelerator Center that houses local technology start-ups, are housed at the park.

Also located in the northern portion of the main campus, the 109-acre University of Waterloo environmental reserve is home to birds and wildlife. Columbia Lake, redesigned to allow for cooling of Laurel Creek, serves as a year-round warm-water sportfish habitat. Riparian buffer, bioswales (vegetated open channels specifically designed to attenuate and treat stormwater runoff), detention ponds and stormwater management ponds further enhance the area's environmental attributes.

5.1.3.3 CASE 2: Environment 3 LEED Construction

Scheduled to open for classes in September 2011, the 57,000-square-foot Environment 3 building will serve as a model of green design and construction on the University of Waterloo main campus. Expanding over the existing Environment 2 building, the facility will house the School of Planning and the School of Environment, Enterprise and Development (SEED).

The Environment 3 building is on track to achieve the highest LEED certification with its comprehensive environmental design features, including:

- Energy efficiency: extensive insulation, high-efficiency lighting, and in-floor heating that recycles heat from computers
- Water conservation: rainwater recycling systems and high-efficiency washroom fixtures
- Air quality: two-storey living wall, connected to the HVAC system
- Green roof: accessible native species garden to serve as a relaxing space for students, staff and faculty

5.1.4 Waste Management

5.1.4.1 On-Campus Recycling

The University of Waterloo participates in the Region of Waterloo blue box recycling program. As a participant, the university has designated recycling areas within every building on the main campus, equipped with two types of blue box containers to separate:

- Newsprint, magazines, boxboard, other paper fibres (except corrugated) and plastic retail bags
- Glass, aluminum, plastics, tinfoil, rigid plastic containers, tetrapak and other materials

5.1.4.2 Organic Waste

The Region of Waterloo green bin program was introduced at the Conrad Grebel University College cafeteria in 2010. The cafeteria was chosen as a pilot site by the region to determine the feasibility of a food waste collection program within a campus setting. In 2010, St. Jerome's University was the only other campus participant that has implemented an organic waste collection program.

A waste audit performed by Waste Services Inc. determined that the university`s annual diversion rate was 24 per cent in 2008. The audit found that this rate could be increased to 39 per cent through additional student and staff education and improvements in internal processes. For example, the university may wish to reduce the growing amount of cardboard waste produced on the main campus (Figure 7) and the amount of organic waste being landfilled.

Figure 7: University of Waterloo Annual Waste Production (Main Campus)[5]
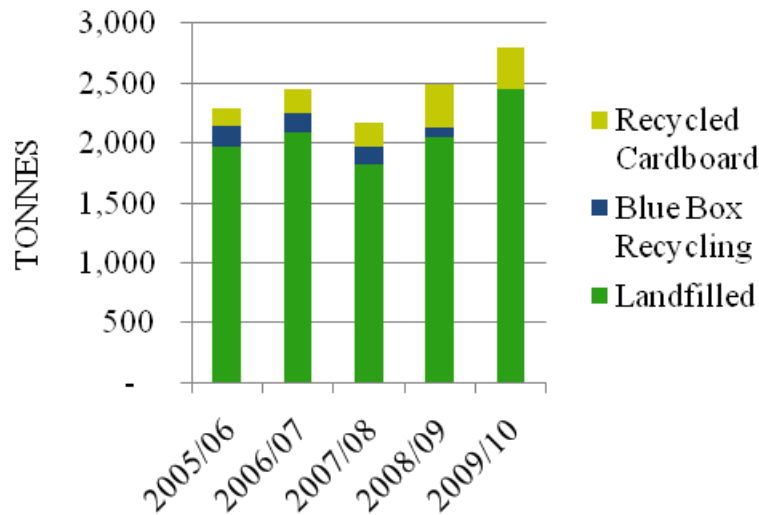
5.1.4.3 White Box Program

The white box program is focused solely on the collection of office paper used for the university's photocopiers and printers. In 2010, 153 tonnes of office paper were sent from the University of Waterloo Central Stores to the Metro Waste Paper Recovery plant in Scarborough for reprocessing. This is a closed loop[6] Recovery Plus program offered through a subsidiary of Cascades Inc., the supplier of the majority of office paper used on campus.

5.1.4.4 Procurement

There are several ways in which the University of Waterloo Procurement and Contract Services office practices environmentally responsible purchasing decisions:

- Request-for-Proposals specify sustainability and environmental considerations as part of the vendor selection process

---

[5] Figure 8 does not reflect the diversion of electronics and office paper through the white box program (discussed on page 13), as the university is reimbursed for recycling of these materials. The apparent reduction in blue box recycling is due to the university no longer tracking the amount of recyclables diverted through the program since the Region of Waterloo assumed the collection of blue box recycling in November 2008.

[6] Production system in which the waste or by-product of one process or product is used in making another product.

- Post-consumer recycled paper content was present in 42 per cent of the university's fine paper purchases in 2010 (Figure 8)
- Washrooms across campus are stocked with 100 per cent post-consumer recycled paper towels and toilet tissue
- A cost-benefit study was distributed by the University of Waterloo Procurement and Contract Services office to encourage the purchasing of "green" products. The study found "green" products financially comparable to the "non-green" products.

Figure 8: University of Waterloo Annual Office Paper Consumption (Main Campus)

5.1.4.5 CASE 3: Green IT

In March 2010, the University of Waterloo Executive council approved the Green Information Systems and Technology Statement (Green IT). Green IT Guiding Principles and Suggested Strategies promote sustainable acquisition, ongoing use and disposal of IT devices on campus. Below are some of the Green IT initiatives implemented at the University of Waterloo Faculty of Applied Health Sciences (AHS) and Faculty of Environment.
Power-Saving Initiatives:
- Computer laboratory machines automatically shut down at 11 pm if the machines are idle; machines automatically start up the following morning before classes begin
- Laboratory printers are set to go into sleep mode

Paper-Saving Initiatives:

- 100 per cent post-consumer recycled paper is used in the computer laboratory printers; default double-sided printing settings have been implemented

- Signs are posted in the laboratories to encourage responsible printing

- Annual paper consumption is tracked within the Faculty of Environment to evaluate the effectiveness of paper-saving initiatives; a total reduction of seven per cent was achieved between 2009 and 2010

Developed by SPRANQ, Ecofont is a font that uses up 20 per cent less ink during printing. AHS Computing has made Ecofont available for download on their website: http://ahsco.uwaterloo.ca/green/printing.html

Other Green IT initiatives already occurring at the University of Waterloo main campus include double-sided printing at the university libraries, which was implemented in 2004. The university may encourage document scanning as opposed to photocopying and printing to further promote paper conservation. Currently, Media.doc centres offer document scanning services on the University of Waterloo main campus.

5.1.4.6 CASE 4: St. Paul's Environmental Leadership

In 2010, St. Paul's cafeteria, Watson's Eatery received the Green Dining Award from Compass Group Canada[7] for its commitment to sustainability. Watson's Eatery offers a "balanced choices" menu to promote healthier eating serves Planet Bean fair-trade organic coffee and does not permit the sale or use of bottled water anywhere on its premises. Staff working at Watson's Eatery keep temperature logs on the equipment, turn it off when not in use, and report on the weekly amount of waste produced in the kitchen. Furthermore, single-use utensils and plates were eliminated from Watson's Eatery catering services.

---

[7] Compass Group Canada is one of Canada's Top 100 Greenest Employers and has more than 2,000 food service provider accounts. To date, only five accounts were recognized with the Green Dining Award.

Organized in 2008 by Sierra Youth Coalition's Sustainable Campuses Project, the Residence Reduction Challenge competition aimed to encourage students living at the University of Waterloo, University of Guelph and Queen's University residences to conserve energy and water and to reduce waste. St. Jerome's University and Conrad Grebel, Renison, and St. Paul's university colleges represented the University of Waterloo. St Paul's residence won the competition, reducing its water and energy use by 62 and four per cent respectively.

5.1.5 CO_2 Emissions

Since 2005, the University of Waterloo has participated in the Region of Waterloo Partners for Clean Air program to improve outdoor air quality by reducing harmful emissions. Annual carbon dioxide (CO_2) emissions from purchased electricity, the burning of natural gas at the boiler plant, and landfilling of waste produced on campus are reflected in Figure 9. Examples of initiatives to reduce atmospheric emissions on the University of Waterloo main campus include:

- Replacing air conditioning units with those that are high-efficiency and CFC-free
- Introducing a universal bus pass for all registered students, thus lowering CO_2 emissions through greater transit use
- Encouraging bicycle use by providing bicycle racks throughout the main campus

Figure 9: University of Waterloo Annual CO₂ Emissions by Source (Main Campus)[8]
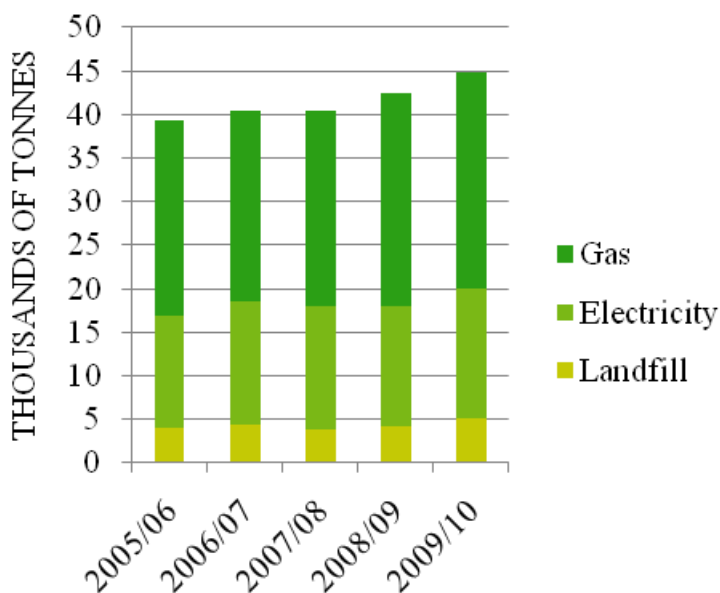
5.2 Social Leadership Section

This section of the *University of Waterloo Sustainable Development Report 2010* addresses health, diversity, employment equity and personal development topics. The majority of the data was obtained through qualitative interviewing with the University of Waterloo Health Services, Safety Office, Organizational & Human Development, Institutional Analysis and Planning, Human Resources, FEDs and St Paul's University College. Health

5.2.1.1 Student Health

Health Services is located on the University of Waterloo main campus. It serves as the first aid station for university employees and visitors, a public health flu immunization clinic open to the community during the flu season, and a primary destination for all registered students requiring medical care. In 2010, there were more than 58,000 visits recorded at Health Services (Figure 10),

---

[8] The data above was estimated using emission factors from Environment Canada (Environment Canada, 2010; Environment Canada, 2011):
- 1,879 grams of CO_2 per m³ of natural gas
- 160 grams of CO_2 per kWh of electricity
- 83 kilograms of methane per tonne of municipal solid waste, with every kilogram of methane equivalent to 25 kilograms of CO_2

48

with most patients seeking attention from a physician or a nurse. Other services sought were allergy injections, birth control pill pick-ups, mental health services and psychiatric consultation.

While the main focus of Health Services is to provide medical care for students, the occupational health nurse provides support to university staff and faculty. Assistance with returns to the workplace after an illness or injury, referrals to the Employee Assistance Program, individual counselling and immunization recommendations are among the services available to staff and faculty.

To enhance patient profiling and to reduce its environmental footprint, Health Services has implemented an electronic medical records system. The new system allows for a comprehensive view of patients' medical history and reduces the amount of paper stock at the clinic.

A change underway in 2011 is the construction of a state-of-art extension to Health Services that will double the size of the facility's functional space. A family clinic for students and local community members with dependents will be one of the services added.

Figure 10: University of Waterloo Annual Visits to Health Services by Destination[9]
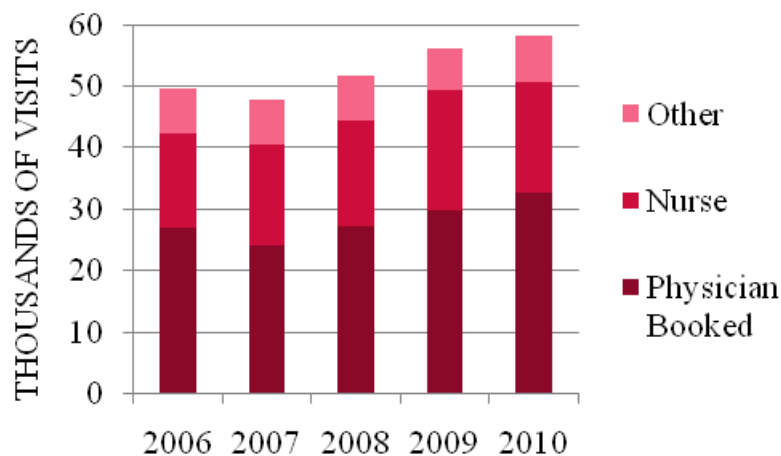
5.2.1.2 Employee Health

The Workplace Safety and Insurance Board (WSIB) injury frequency and injury severity rate information provides a benchmark against which the state of the University of Waterloo's employee

---

[9] Figure 11 does not reflect visits to the laboratory and dietitian consultations. Cancellations are included under Other

health can be compared to persons working in similar occupations*. The university belongs to the WSIB Rate Group 817, comprised of other universities, libraries and museums in Ontario. Generally, universities have the highest injury frequency and injury severity rates in this rate group.

The University of Waterloo tends to have proportionally more employees in higher-risk areas such as food operations and custodial services than other universities that contract these services out. For this reason, its injury frequency rates (Figure 11) and injury severity rates (Figure 12) have been higher than the rate group's average. Slips and trips, burns, repetitive strains and bumps from heavy objects are among the most common incidents.

It is also important for the university to maintain a good health and safety record compared to the rate group to earn rebates on WSIB insurance premiums and to avoid assessed surcharges for poor performance. The university aims to reduce injury frequency rates by providing employees with extensive health and safety training and to lower injury severity rates by helping employees to return to work seamlessly after an injury.

Figure 11: University of Waterloo Annual Injury Frequency Rates[10]

---

[10] The WSIB injury frequency rate is measured as the number of injuries for each 200,000 hours worked by employees. The injury severity rate counts the work days lost, regardless of injury date, per 100 full-time equivalent workers or 200,000 hours worked.

Figure 12: University of Waterloo Annual Injury Severity Rates
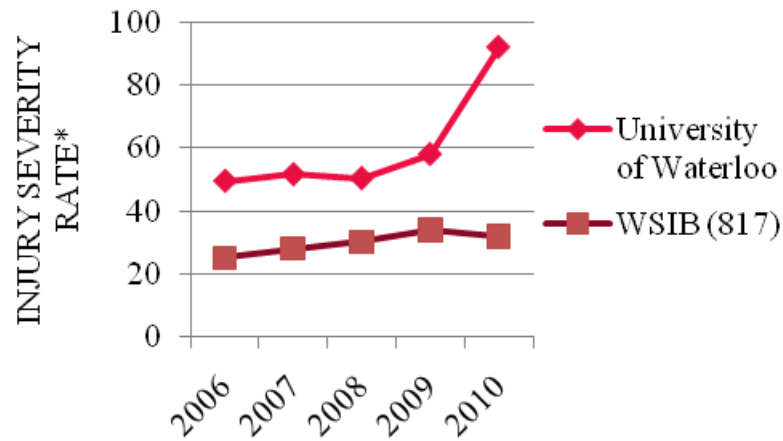
5.2.2 Diversity

5.2.2.1 The One Waterloo Campaign

Created in 2005 and managed by the Federation of Students, the University of Waterloo's One Waterloo Campaign offers events and programs designed to educate students about diversity, promote inclusivity on campus and create a safe space for students to dialogue and learn about problems of discrimination and intolerance. The campaign envisions a campus where differences are not just recognized, but celebrated. The One Waterloo Campaign is the host for annual events such as International Celebrations Week, Black History Month, and Ability Awareness. Additional activities are developed each year based on input from students, the campaign's steering committee and the campaign's student leaders.

5.2.2.2 GLOW - The Queer and Questioning Community Centre

Established in 1971 at the University of Waterloo, GLOW is the "longest-running campus queer organization in Canada." GLOW is committed to promoting inclusion and providing safe spaces to the campus community regardless of sexual orientation or gender identity.

5.2.2.3 Aboriginal Services Centre

In 2010, St. Paul's University College began the construction of a dedicated space for the University of Waterloo's Aboriginal students and Aboriginal programs. The new space will house Aboriginal Services, a lecture hall, staff offices and meeting rooms, as well as the Aboriginal Services Centre (ASC). A large seminar room, kitchen, storage, small library with computer work stations and offices for staff and the visiting Elders In Residence program will be available at the ASC.

### 5.2.2.4 The SHADOW Program for International Students

The SHADOW Program works by pairing up a new international student with a University of Waterloo student volunteer who is accustomed to the university campus, services and local community. International students usually meet with their "shadow" for the first time at the beginning of the academic term, maintain weekly telephone contact and get together in person at least two times each month. The aim of the program is to help international students get familiar with the services on campus and the local areas and make friends.

5.2.3 Employment Equity

The University of Waterloo is a voluntary complier under the Federal Contractors Program established under the Canadian Employment Equity Act to achieve workplace equity for women, Aboriginal peoples, persons with disabilities and members of visible minorities. The University of Waterloo Human Resources department collects equity information from new employees at the time of hire. Currently, information on staff and faculty employment by gender and age is being reported. In 2010, over 60 per cent of staff and 25 per cent of faculty employed at the university were female. In the same year, 46 per cent of staff and 42 per cent of faculty were 50 years of age or older (Figure 13 and Figure 14). This is consistent with Ontario's aging population trend.

In 2010, the Human Resources department has implemented a new recruitment module, enabling the university to monitor such equity data as the percentage of Aboriginal peoples, persons with disabilities and members of visible minorities employed at the university on a level not possible in the past.

Figure 13: University of Waterloo Staff Gender and Age Distribution (2010)
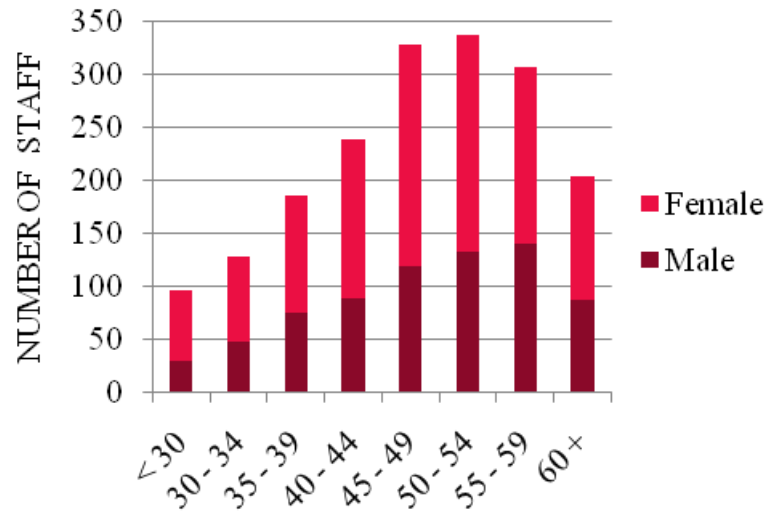
Figure 14: University of Waterloo Faculty Gender and Age Distribution (2010)
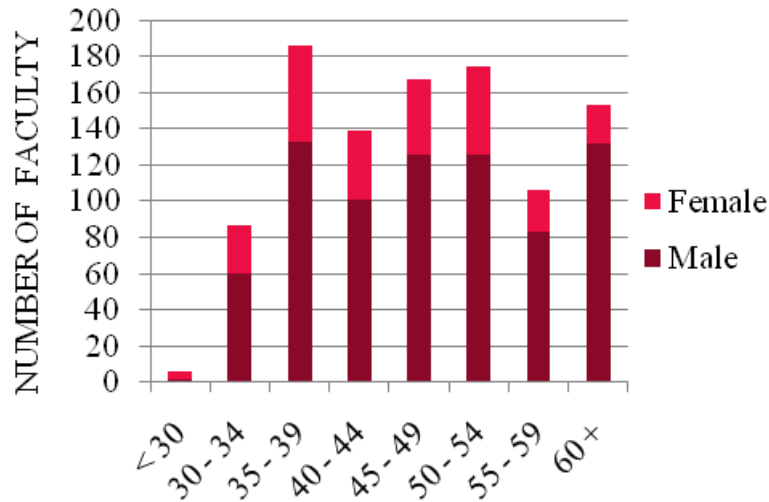
5.2.4 Personal Development

5.2.4.1 The Centre for Career Action

The Centre for Career Action provides confidential career advising to all University of Waterloo staff, students and alumni. Workshops and an online Career Development Manual (CDM) provide help with self assessments, researching occupations, career decision-making, work search and

networking, obtaining interview skills and negotiating job offers. The centre also assists University of Waterloo students and alumni to obtain part-time, summer, and full-time jobs.

5.2.4.2 Staff and Faculty Training

All University of Waterloo staff and faculty are required to complete Employee Safety Orientation and Workplace Violence and Harassment Awareness training. In addition, staff and faculty are also required to fulfill customer service training offered through the persons with disabilities office as part of the Ontarians with Disabilities Act requirements.

In May 2010, the Vice-President Academic & Provost, along with Deans' Council, mandated a two-day workshop on budget-keeping, compliance, faculty policies, and performance measurement for all new department chairs and heads. Moreover, Policy 18 was updated in September 2010, to specify that all university staff are entitled to up to 30 hours of training annually for personal and professional development. Supervisors are expected to encourage staff to use the 30 hours offered. The annual Staff Conference, hosted by the University of Waterloo Organizational & Human Development (OHD) office in April, is one avenue to receive such training. In 2010, more than 1,000 staff participated in a series of workshops and lectures offered at this conference.

5.2.4.3 Student Leadership Certificate Program

The Student Leadership Certificate Program (SLP) also offered through the OHD office, provides leadership development opportunities for all currently registered undergraduate and graduate students at the University of Waterloo. The ultimate goal of the program is to increase students' leadership capacity within the classroom and the campus community, while on co-op employment and after graduation. This is achieved through a series of two-hour workshops that feature personal assessments, group activities, reflection exercises and goal setting opportunities. Principles of teamwork and collaboration, succession planning and dealing effectively with conflict are among the various topics addressed at the workshops.

Students who complete the 12 workshop sessions receive an e-certificate. Since the program's inception in 2008, more than 5,000 students participated and more than 180 students earned the e-certificate at the end of 2010.

5.3 Economic Health Section

This section of the *University of Waterloo Sustainable Development Report 2010* addresses fundraising, research awards, asset management and community outreach topics. The majority of the data was obtained through qualitative interviewing with the University of Waterloo Finance and Administration, Commercialization Office, Athletics and Central Stores.

5.3.1 Fundraising

Launched in 2000, Campaign Waterloo: Building a Talent Trust raised $1.05 billion for the University of Waterloo as of September 2010. Of this sum, the university raised $613.2 million, while an additional $444.9 million was received from government, private and matching sources for campaign priorities (Figure 15). More than 500 new student awards were established as a result of the campaign, providing hundreds of students with scholarships and bursaries. Additionally, a total of 2.5 million square feet was added, increasing campus square footage by 48 per cent since 2000 (see Figure 16 for designations).

Figure 15: Campaign Waterloo Constituencies

(Millions of Dollars, May 2000 to September 2010)
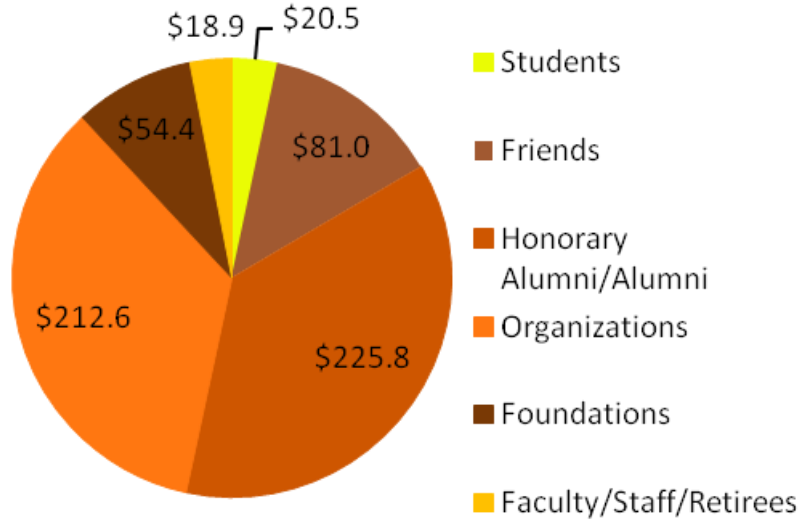
Figure 16: Campaign Waterloo Designations

(Millions of Dollars, May 2000 to September 2010)[11]
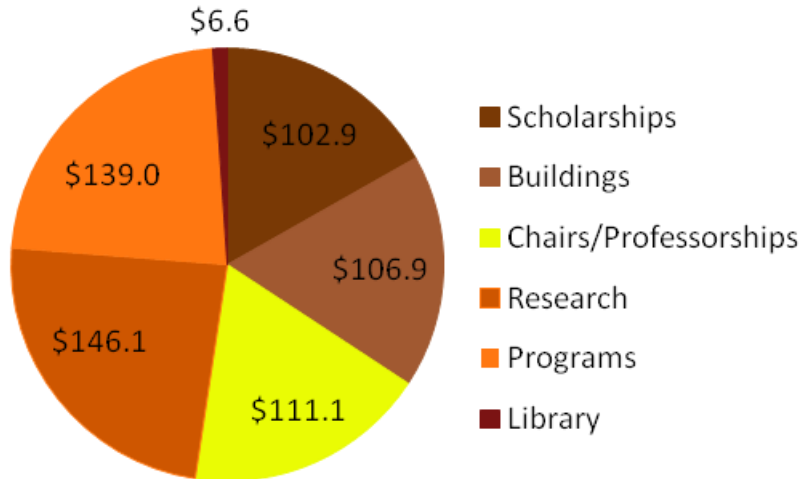
5.3.2 Research Awards

High research activity at the University of Waterloo helps attract graduate students and professors to join the campus community. In the 2009/10 fiscal year, $170 million was raised to

---

[11] $0.6 million in unrestricted funding designation are not shown on the graph.

support the university's research (Figure 17). Nearly 50 per cent of this funding came from the federal government (Figure 18). Tri-Council awards from the Natural Sciences and Engineering Research Council (NSERC), the Canadian Institutes for Health Research (CIHR) and the Social Sciences and Humanities Research Council (SSHRC) comprised a significant proportion of this funding.

Figure 17: University of Waterloo Sponsored Research Awards (by Award Year Ending)
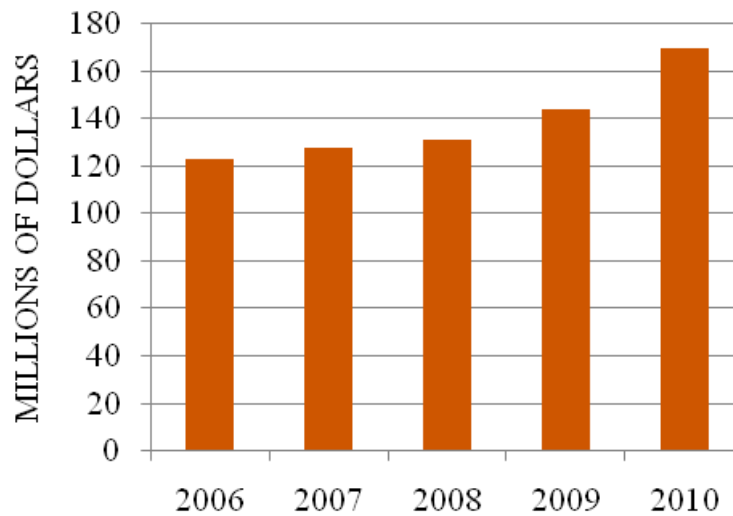
Figure 18: University of Waterloo Sponsored Research Awards by Source (2009/10)
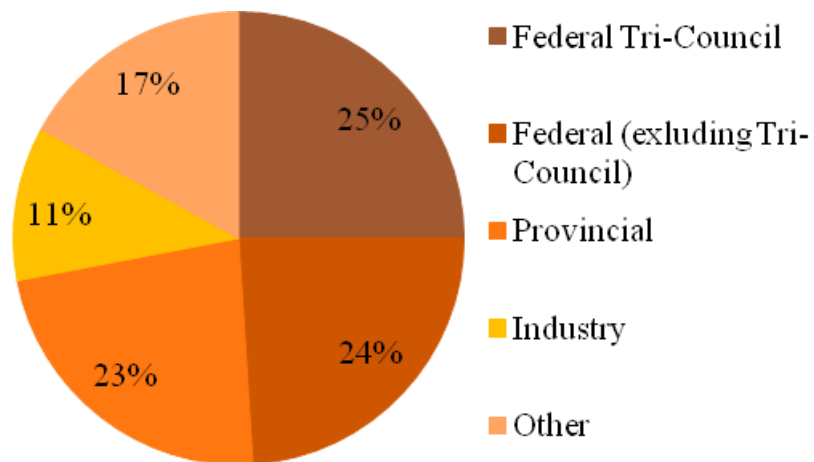
5.3.3 Asset Management

The University of Waterloo Finance and Investment Committee oversees the university's endowment fund management and assists the Board of Governors in the determination of the university's overall investment policies, objectives and strategies. The University of Waterloo Pension and Benefits Committee is responsible for the overall design, modification and administration of the university's pension plan, including its investment objectives, investment managers retention and performance monitoring. Overall, a conservative investment approach is preferred at the University of Waterloo to protect its assets from negative market fluctuations. This explains why fixed-income investments comprise 56 and 49 per cent of the pension and the endowment funds respectively (Figure 19 and Figure 20).

The University of Waterloo currently does not subject its investments to socially responsible investment (SRI) screening.

Figure 19: University of Waterloo Pension Fund Allocation (2009/10)
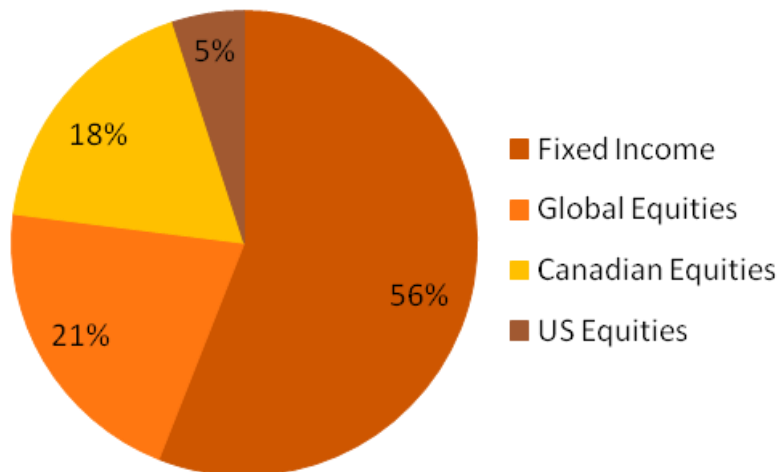
Figure 20: University of Waterloo Endowment Fund Allocation (2009/10)
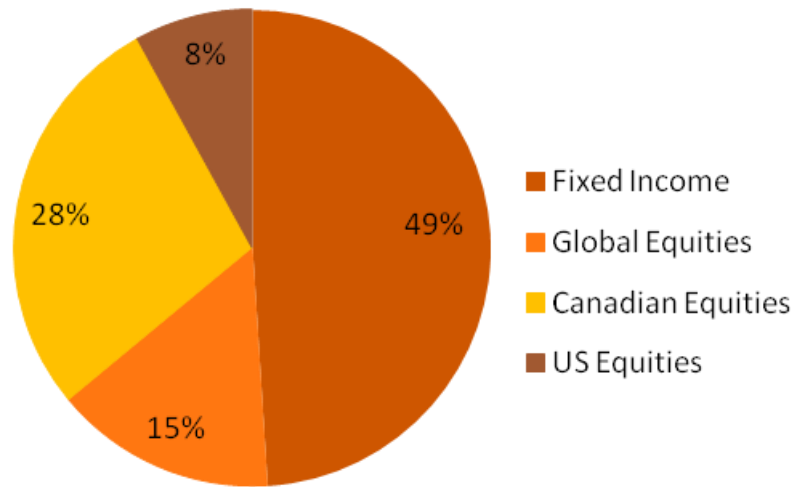
5.3.3.1 Endowment Fund Management

In the 2009/10 fiscal year, the University of Waterloo endowments amounted to $226.7 million. Fundamental to the university's philosophy on endowment fund management is the general principle of maintaining the purchasing power of all endowment funds by limiting the amount made available for spending, and reinvesting any income not made available for spending in a particular year. Such an endowment fund philosophy ensures the university's financial needs are met today and in the future.

5.3.3.2 Pension Fund Management

The University of Waterloo's $1-billion defined benefit pension plan pays benefits that are indexed to inflation, and provides university staff and faculty with a defined pension income. On a yearly basis, actuarial analysis of both present and future pension commitments is performed to ensure the fund's solvency, or its ability to meet long-term liabilities. At the end of 2010, the University of Waterloo pension fund solvency ratio, or the market value of its assets to long-term liabilities, was 0.96. The university aims to achieve a solvency ratio of one, equating the ratio of market value assets to long-term liabilities by 2015.

5.3.3.3 Waterloo Commercialization Office

Effective protection and commercialization of intellectual property (IP) is essential in driving innovation, start-up creation and economic growth.

The Waterloo Commercialization Office (WatCo) works with the University of Waterloo creator-owners to provide IP protection and achieve commercialization. The revenues from commercialization efforts are split 75 per cent to the creator-owners and 25 per cent to the University of Waterloo to recover the IP protection costs. In situations where the creator-owners wish to commercialize independent of WatCo`s involvement, they are free to do so without any further requirement to share commercialization revenues with the university.

An example of WatCo's success was $750,000 secured for a University of Waterloo spin-off, Tyromer, in 2009. The start-up converts scrap tires into a new, high-quality recycled polymer product.

5.3.4 Community Outreach

5.3.4.1 Enrichment Programs

The University of Waterloo offers a number of enrichment programs for youth, from day camps for six- and seven-year-olds to month-long residence programs for high school students. For example, to introduce more females to the opportunities available in engineering and computer science fields, the university hosts two programs for younger girls:

- CS Girls Rock for girls in grades 9-10
- Go Eng Girl for girls in grades 7-10

Other programs, summer camps and events are held regularly. For example, the World Town Planning and Kinesiology Lab Days are hosted at the university in November and December respectively every year.

5.3.4.2 Team-Up Community Outreach Program

Administered by the University of Waterloo Department of Athletics, the Team-Up Community Outreach Program brings volunteer student athletes into local communities to speak to elementary school students about the Six Keys to Success (setting goals, working hard, maintaining positive attitudes, being team players, having positive role models, and making the right choices). In 2010, 42 student-athlete speakers visited 58 different schools in Kitchener, Cambridge, Waterloo, Elmira, St. Jacobs, Breslau, New Dundee, Floradale and Maryhill, Ontario. They spoke to more than 4,600 students, sharing personal stories of accomplishment and perseverance.

5.3.4.3 Electronic Equipment Recycling Day

In 2010, University of Waterloo Central Stores partnered with Research In Motion and GreenTec Recycling Services Inc. to organize the Electronic Equipment Recycling Day. This one-day event made it possible for interested local community members to dispose of unwanted computers, printers, cartridges, cell phones, and other electronic items. Three truckloads of equipment were brought to the GreenTec processing plant for dismantling and recycling; unwanted cell phones were taken to a local women's shelter. Central Stores aims to continue hosting similar events.

5.3.4.4 Waterloo Public Interest Research Group

Founded in 1973, the Waterloo Public Interest Research Group (WPIRG) is a student-run social justice, environmental and leadership action centre at the University of Waterloo. WPIRG volunteers organize leadership skills-building workshops, work with both local and global organizations to spread awareness about social and environmental issues, and bring prominent speakers such as David Suzuki, Stephen Lewis and Ralph Nader to locally held public lectures.

5.3.4.5 Engineers without Borders

Two graduates of the University of Waterloo, Parker Mitchell and George Roter, founded Engineers Without Borders Canada (EWB) in 2000. Today, the organization has nearly 50,000 members working to harness the skills and creativity of the Canadian engineering sector to combat extreme poverty in Africa. At EWB's University of Waterloo chapter, students from engineering and

other disciplines work together to educate the public about the challenges of poverty and available solutions. Every summer, a University of Waterloo student is sent to work for four months with community members in western and southern Africa. The university also supports long-term volunteers, who work overseas for as long as several years.

5.3.4.6 University of Waterloo Sustainability Project

The University of Waterloo Sustainability Project (UWSP) is a student-run organization involved in advocating for, and implementing, sustainability initiatives on campus and in the local community. UWSP projects include waste management, natural landscaping, sustainable transportation, and climate change education and awareness campaigning, as well as organization of events such as Earth Hour and Buy Nothing Day.

5.4 Academic Excellence Section

This section of the *University of Waterloo Sustainable Development Report 2010* addresses co-operative education, research institutes, faculty-based schools and student engagement topics. The majority of the data was obtained through qualitative interviewing with the University of Waterloo Co-operative Education and the Career Services, Waterloo Institute for Sustainable Energy, Schools of Pharmacy, Optometry, Environment, Enterprise and Development, Student Life Office, Student Success Office and Housing and Residences. In addition, Maclean's *Guide to Canadian Universities* was used for the Student Engagement sub-section (Maclean's, 2010; Maclean's, 2009; Maclean's, 2008).

5.4.1.1 Co-operative Education

The University of Waterloo's co-operative education program was founded in 1957, the same year that the university opened. It became the first program of its kind in Canada and now assists nearly 16,000 students annually in finding co-op employment. Alternating four- to eight-month work and academic terms provides University of Waterloo co-op students with opportunities to earn income while gaining up to two years of real-life work experience.

On average, by the time University of Waterloo co-op students graduate, they have earned between $25,000 and $74,000. In the 2009/10 fiscal year, total earnings of co-op students amounted to $139 million (Figure 21). Top employment locations for co-op students were Toronto (26 per cent) and Kitchener-Waterloo (19 per cent), followed by other provincial, national and international destinations.

The Co-operative Education & Career Services department currently manages 28,000 active employer contacts and maintains an overall co-op employment rate close to 97 per cent.

Figure 21: University of Waterloo Co-op Student Earnings by Faculty

(Millions of Dollars, 2009/10)
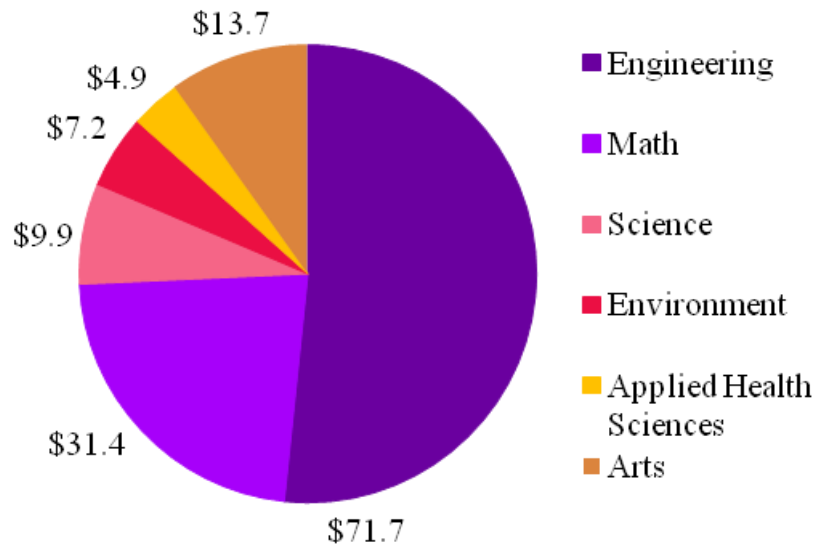
5.4.2 Research Institutes

In 2010, the University of Waterloo was ranked Canada's No. 1 comprehensive research university for the third year in a row in the annual "Canada's Top 50 Research Universities" survey by Research Infosource, a national consulting firm. Profiled below are some of the university's interdisciplinary research centres and institutes that create a unique environment of innovation and collaboration at the University of Waterloo's main campus.

5.4.2.1 The Waterloo Institute for Sustainable Energy

Established in 2008, the Waterloo Institute for Sustainable Energy (WISE) includes more than 80 researchers from the faculties of engineering, environment, science, and mathematics working on energy systems and policies design. The institute promotes environmental sustainability and aims to foster the development of innovative technologies and alternatives to existing energy production and delivery systems. Research areas include renewable energy; battery technologies and energy storage; power systems infrastructure; emissions management; energy efficiency; and demand management.

5.4.2.2 The Water Institute

Created in 2009, the University of Waterloo Water Institute focuses on aquatic ecology and ecotoxicology; groundwater science and engineering; hydrological and atmospheric sciences; water treatment and technology; and water policy, management and governance research. More than 100 faculty members from all of the university's six faculties and close to 20 departments are engaged in these key areas.

5.4.2.3 Interdisciplinary Centre on Climate Change

Based in the Faculty of Environment, the Interdisciplinary Centre on Climate Change (IC3) brings together researchers from the University of Waterloo faculties of engineering, science, and mathematics, as well as from Environment Canada, to tackle issues pertaining to climate change. The institute's five core themes of research are atmospheric science; cryospheric science; human dimensions of climate change; observing systems and modeling; and water, ecosystems, and biogeochemical cycling.

5.4.2.4 The Conrad Centre for Business, Entrepreneurship and Technology

Located in Waterloo's Research and Technology Park, the Conrad Centre for Business, Entrepreneurship and Technology (CBET) promotes a collaborative, risk-taking environment that transforms emerging concepts into commercial success. CBET offers the Master of Business, Entrepreneurship and Technology (MBET), a specialized business degree that focuses on the

commercialization of ideas and discovering new market opportunities. More than 30 successful start-ups have been launched by the MBET graduates in the last five years.

The Institute for Innovation Research (IIR), housed within CBET, provides a focal point for multidisciplinary research on innovation. Researchers from across campus contribute to IIR to develop the next generation of faculty who will provide insight into the management and policy challenges of innovation and commercialization.

A signature University of Waterloo program, Enterprise Co-op is an entrepreneurial-focused co-operative education option for enterprising undergraduate students looking to build their own business.

5.4.2.5 Mike and Ophelia Lazaridis Quantum-Nano Centre (QNC)

Scheduled to open in 2011, the Mike and Ophelia Lazaridis Quantum-Nano Centre (QNC) will become the first research facility of its kind in the world. Up to 400 academics from the Institute for Quantum Computing (IQC) and the Waterloo Institute for Nanotechnology (WIN), as well as University of Waterloo undergraduate nanotechnology engineering students, will come together under one roof.

5.4.3 Faculty-Based Schools

The University of Waterloo offers a wide range of sustainability-related degree programs. For example, students can specialize in environmental engineering, earth sciences, science and business, environment and resource studies, and environment and business, as well as geography and environmental management programs. Notably, the University of Waterloo Faculty of Environment is the oldest faculty of its kind in Canada, and the School of Architecture, the School of Planning and the School of Environment, Enterprise and Development have all been rated as top schools in Canada for incorporating environment into their curriculum. Examples below illustrate the impact that some schools have on the well-being of local communities and the advancement of the broader sustainability movement.

5.4.3.1 School of Pharmacy

Canada's only co-op school of pharmacy opened in 2008 at the University of Waterloo Health Sciences Campus in downtown Kitchener. The school takes advantage of inter-professional learning through collaboration with McMaster University's Michael G. DeGroote School of Medicine, the University of Waterloo's School of Optometry satellite team, and a full-service family clinic, all located at the Health Sciences Campus. Community service learning is incorporated into the school's curriculum, with all first-year students assigned to teams to work with local social service agencies. The School of Pharmacy hosts a series of free public talks and offers the local community a more in-depth six-week paid lecture program on health and wellness.

5.4.3.2 School of Environment, Enterprise and Development

The School of Environment, Enterprise and Development (SEED) launched in 2009. It brings together the unique undergraduate programs of environment and business, which has been ranked No. 1 in the country by *Corporate Knights* magazine[12], and international development. At the graduate level, the school offers a Master of Environment and Business degree, a Master of Development Practice degree, a Master of Local Economic Development degree, and a Graduate Diploma in Social Innovation. Furthermore, SEED houses two unique professional development programs. The sustainability practice program provides sustainable development training to the capital markets, industry, government, NGO community, and other stakeholder groups. The economic development program provides certificate, diploma and fellowship programs through partnership with Economic Developers Association of Canada. SEED is also home to the Social Innovation Generation (SIG) group, a national collaboration addressing Canada's social and ecological challenges by creating a culture of continuous social innovation.

5.4.3.3 The Balsillie School of International Affairs

Founded in 2007 by Jim Balsillie, co-CEO of Research In Motion, the Balsillie School of International Affairs is a collaborative partnership among Wilfrid Laurier University, the University of Waterloo, and the Centre for International Governance Innovation (CIGI), a public policy think-

---

[12] Corporate Knights is a Canadian-based publication that positions itself as the "world's largest circulation magazine with an explicit focus on corporate responsibility."

tank that addresses international governance challenges. More than 60 affiliated faculty members teach and supervise students in the PhD in Global Governance, the Master of Arts in Global Governance, and the Master's in International Public Policy programs. The school runs and supports several seminar series, including the International Governance Speakers Series, the International Human Rights Speakers Series, the Informal Seminar for doctoral students, and the CIGI Junior Fellowship Series, a professional development seminar for masters-level students. The inaugural Multidisciplinary Graduate Student Conference on Global Governance will take place in Waterloo in October 2011.

5.4.3.4 School of Optometry

The University of Waterloo School of Optometry provides the only English optometric training in Canada and accommodates the second-largest centre for contact lens research in the world. The school delivers an accredited four-year degree program leading to a professional Doctor of Optometry (OD). Its clinics serve more than 24,000 patients annually and a unique community outreach program provides mobile care to Mennonite communities, nursing homes, and other groups with patients who have difficulties commuting.

5.4.4 Student Engagement

5.4.4.1 National Survey of Student Engagement

The University of Waterloo participates in the National Survey of Student Engagement (NSSE). The survey evaluates the degree to which students are engaged in their education and university life in general. Maclean's magazine uses the NSSE results to help high school graduates in selecting which university to attend. According to the Maclean's 2010 Guide to Canadian Universities, the University of Waterloo ranked in the bottom ten out of the 56 respondents in the following areas:

- Level of Academic Challenge: number of assigned readings and written reports, as well as coursework emphasizing judgment
- Student-Faculty Interaction: how often students meet with faculty or work with them in research projects or other activities outside of class

- Supportive Campus Environment: extent to which the university supports academic and non-academic endeavours and cultivates positive relationships among students, faculty and staff
- Active and Collaborative Learning: how often students work with classmates, make classroom presentations, or participate in community projects

There may be a link between student engagement and the slight decline in the first-year student retention rates* at the University of Waterloo (Figure 22).

Figure 22: University of Waterloo Annual First-Year Student Retention Rates[13]
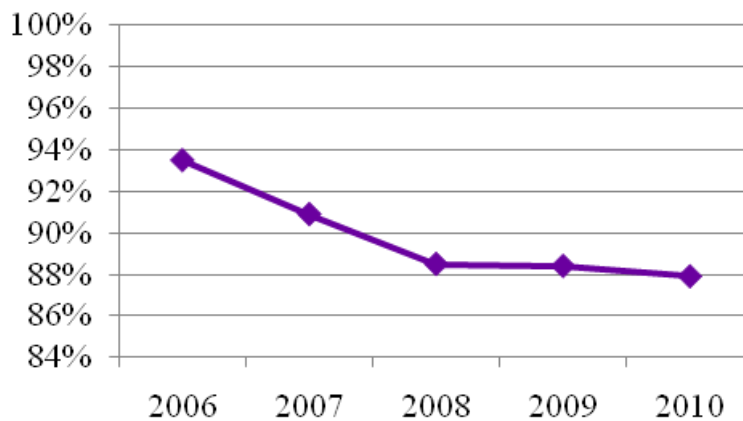
To enhance student experience at the University of Waterloo, and address student engagement and retention issues, a Student Success Office was launched in 2010. The English Language Proficiency Program, Student Life Office, International Student Office and VeloCity are all now part of this office. In addition, new learning support, student technology, and student development units are being developed to help students adapt to campus life. Over the 2011/12 school year, the Student Success Office will be established on the second floor of South Campus Hall.

---

[13] First-year student retention rates are measured as the percentage of first-year students who return to the university in second year. Data adapted from Maclean's 2006, 2007, 2008, 2009 and 2010 Guides to Canadian Universities.

5.4.4.2 Living-Learning Communities

A Living-Learning Community is a small group or "cluster" of eight to 16 first-year students who are enrolled in the same academic program and who share classes, living space and friendships. These clusters of students are placed within larger residence communities of 40 to 60 students. Such an arrangement gives students the opportunity to live near classmates and to meet people from other academic programs. Upper-year students called "Peer Leaders" are also involved in the program and help facilitate academic events and study skills sessions.

5.4.4.3 VeloCity Residence

Launched in 2008, the University of Waterloo VeloCity residence accepts 70 students on a term-by-term basis to live in a digital media "dormcubator." Throughout the term students are exposed to speakers, mentors, resources and a community of like-minded and driven entrepreneurs. A number of successful start-ups have initiated out of VeloCity, including Kik Interactive, Inc., the creator of a free real-time communication application between mobile device users.

5.5 Report Format

The *University of Waterloo Sustainable Development Report 2010* contains all components identified as integral to a well-designed sustainability report in chapter three, section 3.6. The contents are organized by the four guiding principles of sustainable development as it relates to a higher education institution: environmental responsibility, social leadership, economic health and academic excellence. In the final report format, these four sections are colour-coordinated to enhance the clarity of presentation. The key performance areas (such as energy, water, land use, waste management and CO_2 emissions under the environmental responsibility section) are distinctly labeled using tabs format. The report makes use of white space, eco-friendly font where possible and limited graphics to reduce the amount of ink used if printed in the future. Please see Appendix I for the final formatted version of the *University of Waterloo Sustainable Development Report 2010.*

Chapter 6

Discussion and Conclusions

This thesis presents a seven-step process for first-time sustainability report development at a higher education institution. It draws from the analysis of literature on sustainability reporting initiatives at the municipal, corporate and higher education sectors and from the experience of creating the first-ever sustainable development report at the University of Waterloo. The major theoretical contribution of this thesis is the synthesis of municipal, corporate and higher education indicator development literature into a step-by-step process for first-time sustainability report development. The *University of Waterloo Sustainable Development Report 2010* is the main practical contribution and a manifestation of what content a sustainable development report for a higher education institution can include and what its format can be.

The chapter first discusses similarities of each step of the seven-step process for first-time sustainability report development to the content in the reviewed literature in section 6.1. Differences between the seven-step process and the reviewed municipal and corporate sustainability reporting processes are subsequently examined in section 6.2. These two sections respond to the first research question (*What is the process for developing a first-time sustainability report for a higher education institution?*). Section 6.3 discusses the second research question (*What content should a sustainable development report for a higher education institution include and what should its format be?*). Section 6.4 details recommendations, while section 6.5 offers limitations and future research directions. The chapter ends with a conclusion in section 6.6.

6.1 The Seven-Step Process for First-Time Sustainability Report Development at the Higher Education Sector

Academic literature does not currently provide explicit step-by-step guidance for developing sustainability reports in the higher education sector. Fortunately, there is ample discussion about sustainability indicator selection and validation methods and about sustainability report development processes applicable to municipal and corporate sectors. By combining findings from this discussion with the hands-on experience of developing the *University of Waterloo Sustainable Development*

Report 2010, I was able to devise the seven-step process for first-time sustainability report development (see Figure 23) to be used at the higher education sector:

Figure 23: The Seven-Step Process for First-Time Sustainability Report Development at the Higher Education Sector

STEP 1: Review higher education sector sustainability reports

STEP 2: Review higher education sector sustainability assessment tools

STEP 3: Develop a draft 'sustainable development' definition and associated guiding principles

STEP 4: Engage the Stakeholders

STEP 5: Collect sustainability performance information

STEP 6: Verify the accuracy of the report

STEP 7: Publish the report and welcome feedback

Each step is discussed below for its similarities to the content in the literature.

STEP 1: Review higher education sector sustainability reports

Literature Findings: When setting out to create their first sustainable development report, Worcester Polytechnic Institute authors analyzed nine campus sustainability reports to determine their key features and structures (Alden *et al.*, 2010). The authors found that the reports were generally 20 to 50 pages long, profiled approximately 20 sustainability performance indicators, and made extensive use of pictures and graphs. An introduction, letter from a sustainability representative or president and recommendations were other key components (Alden *et al.*, 2010).

University of Waterloo Approach: I reviewed seven sustainability reports prepared by Canada's largest universities (Fonseca *et al.*, 2010) and a random sample of ten other higher education sector sustainability reports. The findings from this review determined the structure of *University of Waterloo Sustainable Development Report 2010*.

STEP 2: Review higher education sector sustainability assessment tools

Literature Findings: There is a diversity of sustainable development assessment tools available, with varying emphasis placed on the environmental, social and economic aspects of sustainability

performance measurement and on the level of reporting detail (Tanguay *et al.*, 2009, United Nations, 2007, Wilson *et al.*, 2007). Similarly, a variety of sustainability assessment tools is available for use at the higher education sector (Fonseca *et al.*, 2011; Shriberg, 2002). Of these tools, CSAF, STARS and GRI have gained popularity (Alden *et al.*, 2010; Fonseca *et al.*, 2011; Lozano, 2011). Selecting sustainability performance indicators from existing professionally-designed assessment tools helps to ensure scientific validation of the process (Cloquell-Ballester *et al.*, 2006; Donnelly, 2007).

University of Waterloo Approach: I undertook a holistic comparison of the indicators contained in CSAF, STARS and GRI sustainability assessment tools. I constructed a spreadsheet, grouping similar indicators together to arrive at a list of 'must-have' sustainability indicators for higher education institutions. This step helped me gain better understanding of key sustainability performance areas that the *University of Waterloo Sustainable Development Report 2010* needed to address.

STEP 3: Develop a draft 'sustainable development' definition and associated guiding principles
Literature Findings: Prior to any reporting effort, stakeholder consensus must be reached on the 'sustainability' definition reflective of their core values and priorities (Cloquell-Ballester *et al.*, 2006; Donnelly *et al.*, 2007; Mitchell *et al.*, 1995). To achieve an organized reporting structure, it is then important to establish guiding principles and select sustainability performance indicators (Troschinetz *et al.*, 2007). There are merits of providing a draft document with possible sustainability goals and indicators to the stakeholders to drive the discussion (Valentin and Spangenberg, 2000).

University of Waterloo Approach: After reviewing 17 higher education sector sustainability reports and CSAF, STARS and GRI sustainability assessment tools, I created a document that contained a draft 'sustainable development' definition and associated guiding principles. The definition aimed to answer the following questions: 'what are we trying to sustain?' and 'who are our key stakeholders' in context of the University of Waterloo. The titles of the associated guiding principles signified broad categories of sustainability to be addressed in the report, and their descriptions suggested key performance areas to evaluate. The document was distributed to the Sustainable Development Advisory Committee members prior to their workshop meeting (Step 4).

STEP 4: Engage the Stakeholders

Literature Findings: Stakeholder consensus-building on the definition and principles of sustainable development helps to identify an agreed vision of sustainability (Mitchell et al., 1995). To this end, the merits of bringing stakeholders and subject-matter experts together in a workshop discussion were outlined by Donnelly *et al.*, 2007:

    a) better way to communicate and explain detailed ideas and opinions
    b) good forum for interactive discussion and allows trains of thought to be continuous rather than
       stopping and starting as with other forms of communication such as the internet
    c) having all stakeholders in the one place allowing people to openly discuss issues with
       individuals over coffee or at breaks

Donnelly *et al.*, 2007, p. 167

Particularly, the inclusion of subject-matter experts (Reed *et al.*, 2006) and high-level decision-makers at this point is important for the report recommendations to be actionable later on (Bardati, 2006; Beringer, 2006; Herremans and Allwright, 2000; Rametsteiner *et al*., 2011; Valentin and Spangenberg, 2000).

University of Waterloo Approach: The Sustainable Development Advisory Committee, comprised of sustainability subject-matter experts from private, public and NGO sectors, university professors and undergraduate and graduate student representatives was formed to help me conceptualize the *University of Waterloo Sustainable Development Report 2010*. The committee's first task was to review the draft sustainable development definition and associated guiding principles and to provide feedback during a workshop discussion. The final sustainable development definition and associated guiding principles for the *University of Waterloo Sustainable Development Report 2010* emerged from this workshop discussion. One weakness of the process employed at the University of Waterloo during this step was the lack of the university's senior administration at the workshop discussions. Had the sustainability reporting initiative been a formal undertaking on behalf of the university, senior administration would be present. Furthermore, had the University of Waterloo established the sustainability definition, principles, goals and policy previously, this stakeholder engagement step would likely be reduced to sustainability indicator selection.

STEP 5: Collect sustainability performance information

Literature Findings: Employing purposeful sampling and conducting face-to-face interviews during the data collection stage allows for attainment of in-depth information (Alden *et al.*, 2010; Patton,

2002). Snowballing, or asking for references to obtain further information, is a useful technique (Alden *et al.*, 2010; Patton, 2002). During this stage it is important to gather for both positive and negative stories to ensure transparent reporting (Blackburn, 2007). In fact, there are benefits of profiling negative stories to increase credibility of sustainability reports (Adams, 2002). To ensure readability of the report, one needs to maintain concise information (Alden *et al.*, 2010). In fact, 'condensation of data' must take place from detailed and scientifically-oriented information to a short and user-friendly format to entice public interest in the report (Shields *et al.*, 2002).

University of Waterloo Approach: Most of the information contained in the *University of Waterloo Sustainable Development Report 2010* was obtained through personal interviews. Where additional interviews were needed, I asked for suggested interviewees. Other information was obtained from publically available documents. I sought five-year data, where applicable, to determine sustainability performance trends and inquired about both success stories and outstanding challenges.

STEP 6: Verify the accuracy of the report
Literature Findings: Using member-checking, peer debriefing, and an external auditor can help ensure data accuracy (Creswell, 2008).

University of Waterloo Approach: I used member-checking and peer-debriefing strategies to ensure report accuracy. First, I sent sections of the draft *University of Waterloo Sustainable Development Report 2010* to the university staff from whom I obtained the information. The staff members reviewed the sections for accuracy and provided feedback on any changes to be made. Then, I used the services of a technical writer to edit the entire report for grammar and punctuation. As a peer-debriefing strategy, members of the Sustainable Development Advisory Committee and three independent readers reviewed and provided high-level comment on the draft *University of Waterloo Sustainable Development Report 2010*. Lastly, the University of Waterloo Communications and Public Affairs reviewed and edited the report.

STEP 7: Publish the report and welcome feedback
Literature Findings: Since minimizing the environmental footprint is one of the common sustainability goals (Stafford, 2010), it is best to publish sustainability reports on-line and have only a limited number of copies available in print (Alden *et al.*, 2010). Once the report is available for

viewing, it is important to establish a feedback mechanism to accommodate comments, queries and recommendations. This will improve reporting efforts and help meet stakeholder needs more adequately in the future (Group of 100, 2003). According to Walton, the medium of sustainable development reports "is perhaps one of the most important aspects to consider in order to reach stakeholders efficiently and effectively", with the World Wide Web having the following advantages over paper-copy sustainability reports:

(i) Time saving.
(ii) Very little paper is used in the collection of information (over e-mail, via floppy disks or file transfer protocol).
(iii) Ease of updating information (no paper reprints).
(iv) The ability to include graphics and photographs.
(v) The effective use of economic and technological resources.
(vi) Current e-mail addresses of key personnel.
(vii) Feedback mechanisms (hypertext e-mail and comment forms).
(viii) Analysis mechanisms.
(ix) Global availability while simultaneously being used internally by students and staff.

Walton *et al.*, 1997, p. 207

In particular, placing sustainability reports within their own dedicated web pages and using hypertext links improves the readability and communicability of the information (Walton *et al.*, 1997).

University of Waterloo Approach: The *University of Waterloo Sustainable Development Report 2010* was released on-line on August 3, 2011 on the University of Waterloo Public Accountability http://uwaterloo.ca/accountability/ and Sustainability http://www.sustainability.uwaterloo.ca/ web pages. The release of the report was accompanied by a university news article on August 8, 2011 http://www.bulletin.uwaterloo.ca/2011/aug/08mo.html (please see Appendix H). The feedback about the report is to be documented by the Faculty of Environment Development and Communications Officer to be used for future sustainability reporting improvements.

6.2 Differences

The discussion above draws parallels between the approach that I have taken and evidence from literature, suggesting that the seven-step process for first-time sustainability report development at the higher education sector is theoretically-sound. However, in grounded theory, it is important to note six main differences between the proposed seven-step process and the sustainability reporting

processes from the municipal and corporate sectors reviewed earlier. The table below illustrates these differences:

Table 2: Differences between the Proposed Process for First-Time Sustainability Report Development at the Higher Education Sector and Selected Municipal and Corporate Sustainability Reporting Processes

Step	The Seven-Step Process for First-Time Sustainability Report Development at the Higher Education Sector	The Eight-Step Process to Preparation of a Public Environmental Report (PER) (Commonwealth of Australia, 2000)	Urban Sustainability Reporting (Maclaren, 1996b)	Framework for Evaluating Processes of TBL Reporting (Mitchell *et al.*, 2008)
Other earlier steps suggested		Investigate the rationale for a PER		
1. Review higher education sector sustainability reports	✓			
2. Review higher education sector sustainability assessment tools	✓			
3. Develop a draft 'sustainable development' definition and associated guiding principles	✓			
4. Engage the Stakeholders	✓	✓	✓	✓

5. Collect sustainability performance information	✓	✓	✓	✓
6. Verify the accuracy of the report	✓	✓	✓	✓
7. Publish the report and welcome feedback	✓	✓	✓	✓
Other later steps suggested			Assess indicator performance (are the indicators performing adequately in measuring what they were meant to measure)	Create links between the sustainability reporting process and organization's everyday activities
				Collaborate with other organizations in achieving sustainability goals

First, stakeholder identification and engagement are usually the first steps in municipal and corporate sustainability report development (Commonwealth of Australia, 2000; Maclaren, 1996b; Mitchell, 2008). Alternatively, the proposed seven-step process for first-time sustainability report development suggests to first review higher education sector sustainability reports and sustainability assessment tools, as well as to develop a draft 'sustainable development' definition and associated guiding principles prior to identifying key stakeholders in Step 4[14]. This difference is due to the first-time nature of the seven-step process. In particular, the assumption is that the person in charge of sustainable development report creation needs to familiarize them self with higher education sector sustainability reports and sustainability assessment tools in order to adequately lead the report development process. Indeed, Step 1 and Step 2 could be omitted if the person in charge of sustainability report development is already familiar with the optimal report structure and the

---

[14] Step 3 entails identification of key stakeholders in the draft definition of 'sustainable development'.

commonly-suggested performance indicators. Nevertheless, one may regard undertaking Step 1 and Step 2 as good due diligence practice. For example, the authors of the Worcester Polytechnic Institute sustainability report have also reviewed higher education sector sustainability reports and sustainability assessment tools as their first steps (Alden *et al.*, 2010).

The second difference is exhibited in Step 3 of the proposed seven-step process - developing a draft 'sustainable development' definition and associated guiding principles. While the municipal and corporate processes reviewed earlier (Commonwealth of Australia, 2000; Maclaren, 1996b; Mitchell, 2008) do not explicitly call for a draft document to be distributed to stakeholders prior to any discussions, the rationale for doing so was advocated for in Valentin and Spangenberg work on community sustainability indicators (Valentin and Spangenberg, 2000). A more productive discussion among the stakeholders can be achieved if they are provided with a common starting point for discussion. The subsequent steps suggested in the municipal and corporate sectors are identical to the proposed seven-step process: engaging stakeholders in the selection/development of sustainability goals and indicators, collecting data, analyzing results, and publishing the report (Commonwealth of Australia, 2000; Maclaren, 1996b; Mitchell, 2008).

The third difference is unique to the *Eight-Step Process to Preparation of a Public Environmental Report (PER),* which suggests to investigate the rationale for a PER prior to any reporting effort (Commonwealth of Australia, 2000). The proposed seven-step process assumes that at the point of sustainable development report writing, the rationale has been determined. For a discussion on why a higher education institution may wish to prepare a sustainability report, please see Literature Review chapter.

The fourth difference is specific to the *Urban Sustainability Reporting* process which recommends assessing indicator performance to understand whether the selected indicators adequately measure what they were meant to measure (Maclaren, 1996b). The proposed seven-step process focuses on the development on the first-time sustainability reports. While it is important to understand whether the use of selected indicators has led to desirable reporting, this evaluation is reserved for the subsequent sustainability reporting efforts. It is not the aim of this thesis to discuss the process relating to the follow-up sustainability reports.

The last two differences between the proposed seven-step process and the municipal and corporate sustainability reporting processes - creating links between the sustainability reporting process and organization's everyday activities and collaborating with other organizations in achieving sustainability goals - are particular to the *Framework for Evaluating Processes of TBL Reporting* (Mitchell et al., 2008). The seven-step process assumes that the report creates links between the sustainability reporting process and organization's everyday activities in the recommendations section of the report. Collaboration with other organizations may or may not be applicable to achieve sustainability goals – as such was not profiled in the concise seven-step process.

Aside from the specific process differences between the proposed seven-step process and the reviewed municipal and corporate sectors, there are other considerations that arise from higher education sustainability literature. The latter often suggests employing a group of students to carry out data collection (Bardati, 2006; Ferreira *et al.,* 2006; Helferty & Clarke, 2009; Mitchell, 2011). Emphasis on having a sustainability coordinator to guide the effort is also noted (Alden *et al.*, 2010; Herremans and Allwright, 2000). While there are educational merits of engaging students in the sustainability report creation, there might be no system in place, or willingness to organize such effort. There also might be administrative pushback to allocate resources to establish a sustainability coordinator position at the institution. This thesis demonstrates that sustainability reporting task can be carried out by one graduate student. However, it is important to note that the student must have sufficient guidance, which in this case was achieved by having my two Master's supervisors and Sustainable Development Advisory Committee advise on the process. Equally important is to establish support for sustainability reporting among key information gate-keeper staff in charge of the sustainability performance data. The university's previous commitment to the *Ontario Universities: Committed to a Greener World* pledge helped facilitate this process.

6.3 First-Time Sustainable Development Report Content and Format

The *University of Waterloo Sustainable Development Report 2010* provides an example of the content and format attainable for a higher education institution following the seven-step process for first-time sustainability report development. As discussed in chapter 4, the GRI, STARS and CSAF sustainability reporting tools guide sustainability reporting effort among Canada's largest higher education institutions (Fonseca *et al.*, 2010). Since these institutions use elements of the GRI,

STARS and CSAF sustainability reporting tools to track sustainability performance, I undertook a comparison of the three tools to identify key sustainability indicators (AASHE, 2011b; Global Reporting Initiative, 2006; Lozano, 2011; Sierra Youth Coalition, 2009b). The findings, summarized in Table 1, are illustrative of the most critical sustainable development report content for a higher education institution. Of all key sustainability indicators, only two, the "Student, Staff and Faculty Sustainability Training" and "Sustainability-Related Courses" were not addressed in the contents of *University of Waterloo Sustainable Development Report 2010.* The reason for not addressing the "Student, Staff and Faculty Sustainability Training" indicator was the absence of sustainability training at the University of Waterloo. Instead, the report profiled staff and faculty training and leadership certificate program (please see Appendix I, page 138). The reason for not addressing the "Sustainability-Related Courses" indicator in the contents of *University of Waterloo Sustainable Development Report 2010* was the absence of required information and lack of resources to collect such information in a timely fashion. While these two indicators were not addressed in the *University of Waterloo Sustainable Development Report 2010*, I obtained additional information, such as student visits to the on-campus clinic (Appendix I, page 134), fundraising efforts (Appendix I, page 140), research grants (Appendix I, page 141), pension and endowment fund management (Appendix I, page 142), and student engagement performance data (Appendix I, page 152). Based on the feedback obtained through the interviews with the University of Waterloo staff, this information was identified as important for a higher education institution sustainable development report content. The findings were illustrative of the grounded theory practice, as the generation of theory about sustainable development report contents for a higher education institution occurred during the data collection step (Dey, 1999).

Choosing an appropriate report layout is important to ensure the ease of navigation through the report's contents and to maintain the reader's interest. Section 4.1 summarizes findings from my review of seven sustainability reports prepared by Canada's largest universities (Fonseca *et al.*, 2010) and identifies components of a well-designed sustainability report. These findings are confirmed by a review undertaken at the Worcester Polytechnic Institute (Alden *et al.*, 2010). Thus, the organizational structure of the *University of Waterloo Sustainable Development Report 2010* as illustrated in Appendix I is defensible and serves as a good stylistic example. The mix of stories, graphs and photos, as well as report's short length (40 pages) help maintain the reader's interest in the report's contents (Alden *et al.*, 2010; Blackburn, 2007). The value-laden nature of sustainability

reporting, the need for institutions to reflect their unique culture, and the subjective preferences of the report writers explain the differences in reporting content and layout choices across sustainable development reports prepared at higher education institutions (Cloquell-Ballester *et al.*, 2006; Donnelly *et al.*, 2007; Tanguay *et al.*, 2009, United Nations, 2007, Wilson *et al.*, 2007). However, the *University of Waterloo Sustainable Development Report 2010* exemplifies the attributes of a comprehensive yet a concise sustainable development report for a higher education institution.

6.4 Recommendations

The key determinant of a successful sustainability reporting effort is the early support for the initiative among the information gate-keeper staff. Ensuring that staff from Plant Operations (responsible for energy, water and waste management, land use and maintenance), and Central Stores and Procurement were willing to help with sustainability reporting meant that I was able to gather needed information for the Environmental Responsibility section of the report. Equally crucial was the readiness of staff from other departments to invest time and assist with Social Leadership, Economic Health and Academic Excellence sections. If the staff was not inclined to disclose relevant data and share their insight, it would be nearly impossible to continue with the report development, as the majority of information was not easily available publically.

Another recommendation is to obtain support for sustainability reporting from the institution's senior administrative personnel. Drawing from the University of Waterloo experience, I preferred to approach the senior administrative personnel at later stages, once the first draft of the *University of Waterloo Sustainable Development Report 2010* was prepared. This allowed for a more concise discussion, with less unanswered questions about the university's sustainability performance. The aim of involving senior administrative personnel was to ensure that the report was relevant in grand considerations of university's operations, that the recommendations were executable, and that there was support for the report's distribution. While this approached worked well at the University of Waterloo setting due to the close-knit relationships between senior administrative personnel and the key information-gatekeeper staff, involving senior administrative personnel at the beginning of the process may prove more effective for other institutions. For example, senior administrative personnel could provide valuable insight in Step 4 during the workshop setting, by aligning the reporting effort with the strategic interests of the institution.

Regarding recommendations for the subsequent sustainability reporting efforts at the University of Waterloo, there are five main issues that need to be addressed. First, the frequency of sustainability reporting needs to be determined. Annual reporting would ensure the most pertinent information being conveyed and used for decision-making. Second, the university needs to devise an actionable sustainability plan with measurable performance objectives for each of the environmental, social, economic and academic focus areas and report on the progress of achieving each objective. Third, the dedicated role for the sustainability reporting effort needs to rest with a permanent staff member to ensure consistency and efficiency. Fourth, the university needs to collaborate with peer institutions to drive effort towards common sustainability benchmarking. This may involve facilitating discussion about the 'must have' core set of sustainability indicators that would be meaningful and practical to adopt across the higher education sector in Ontario. Finally, based on the feedback obtained upon the release of the University *of Waterloo Sustainable Development Report 2010,* revisions to the content and format of the subsequent reports might have to be made. Regarding the format of the report, it would be particularly useful to investigate an option of dedicating a permanent web page for the University of Waterloo Sustainable Development Reports. The use of hyperlinks and interactive feedback mechanisms may improve the readability of future reports (Walton *et al.*, 1997). Regarding the contents, subsequent reports will need to reflect the university's response to the recommendations contained it the Future Directions section of the Report (Appendix I, page 158).

6.5 Limitations and Future Research

This thesis investigates the process entailed in the development of the first-time sustainability reports for the higher education sector. The discussion is particularly relevant for those institutions with no sustainability policies and plans in place. Such institutions are less likely to have a sustainability definition and established sustainability guiding principles in place to direct their reporting effort. Thus, they are more likely to partake in a stakeholder discussion to determine the most vital components and sustainability performance measures. Further research is needed to shed light in the process of writing follow-up sustainability reports for the higher education sector.

The second limitation of this thesis was its reliance on a single case for research investigation. I could have volunteered to develop sustainability reports for other universities to build

my sample size, however that would not be practical. Further research may investigate how other higher education institutions approached the development of their first sustainability reports and compare findings to the seven-step process profiled in this thesis.

The third limitation, employing a bottom-up approach for sustainability indicator selection, as opposed to using a standardized set may make it harder to compare sustainability performance to peer institutions in the future. More research is needed to arrive at an even shorter list of sustainability indicators that is currently contained in the CSAF Core and STARS sustainability assessment tools. A shorter list of fewer than 30 indicators, similar to the one contained in Table 1, could prove more accessible to the higher education institutions. With more higher education institutions evaluating their performance using these common indicators, better benchmarking could become possible among peer institutions.

Finally, the contents presented in Chapter 5 and the format of the *University of Waterloo Sustainable Development Report 2010* as illustrated in Appendix I exemplify what a sustainable development report may look like following the seven-step process. Whereas the components of a well-designed sustainability identified in section 3.6 are most likely to be relevant for most higher education sector reports, the contents will differ for other higher education institutions depending on the sustainability reporting tools and indicators chosen.

6.6 Concluding Thoughts

Sustainability means different things to different people (Gustavson *et al.*, 1999; Levett, 1998) and sustainability performance measurement is an inherently value-laden process (Bossel, 1996; Bell and Morse, 2004; Cloquell-Ballester *et al.*, 2006; Donnelly *et al.*, 2007; Wilson *et al.*, 2007). In the context of local governments, different sustainability goals are important to different communities and different residents of those communities hold their own perspectives of what these goals should be (Freebairn and King, 2003; Maclaren, 1996b; Reed *et al.*, 2006; Valentin and Spangenberg, 2000). The purposes of sustainability reporting in the municipal sector range from policy development to encouraging community action on related issues (ICLEI, 1996; Seasons, 2003). In a corporate context, different sustainability initiatives have varying business objectives (Group of 100, 2003). The purposes of corporate sustainability reporting range from materiality

disclosures for investor and shareholder decision-making, to performance tracking, to brand-awareness and signalling of good management (Canadian Securities Administrators, 2010; Futerra Sustainability Communications *et al.*, 2010; Ioannou and Serafeim, 2011; KPMG and Group of 100, 2008). In the context of higher education, sustainability initiatives range from minimizing the environmental footprint of operations to integrating sustainability in education for knowledge creation and character development (Cortese, 2003; Mathews, 1997; Velazquez *et al.*, 2006). However, sustainability reporting in the higher education sector is limited (Fonseca *et al.*, 2010; Global Reporting Initiative, 2011b). This may be due to the lack of step-by-step sector-specific guidance on sustainability reporting – a gap that this thesis addresses. The seven-step process for first-time sustainability report development at the higher education sector is built on both the empirical evidence obtained through the creation of *University of Waterloo Sustainable Development Report 2010* and the literature review on indicator selection and validation theory, as well as the processes for sustainability reporting exhibited in the municipal and corporate sectors and practices detailed in the higher education sustainability literature. As such, this thesis serves as a practical tool for higher education sector practitioners considering the task of undertaking sustainability reporting for the first time.

Bibliography

Adams, C. A. 2002. Internal organisational factors influencing corporate social and ethical reporting: Beyond current theorizing. *Accounting*, *Auditing & Accountability Journal* 15 (2): 223-250

Adams, C. A. and Frost, G. R. 2008. Integrating sustainability reporting into management practices. *Accounting Forum* 32: 288–302

Alden, N., Gomez, J. and Shang, S. 2010. Developing an annual sustainability report for WPI. An interactive qualifying project for the faculty of Worcester Polytechnic Institute, Massachusetts.

Association for the Advancement of Sustainability in Higher Education (AASHE) (a). 2011. *STARS Dashboard*. Retrieved August 26, 2011 from: https://stars.aashe.org/institutions/data-displays/dashboard/

Association for the Advancement of Sustainability in Higher Education (AASHE) (b). 2011. *Technical Manual*. Retrieved March 14, 2011 from: http://www.aashe.org/files/documents/STARS/stars_1.1_technical_manual_final.pdf

Babbie, E. 2010.The Practice of Social Research. (12th edition). Belmont: Wadsworth Publishing Co Inc.

Bardati, D. R. 2006. The integrative role of the campus environmental audit: Experiences at Bishop's University, Canada. *International Journal of Sustainability in Higher Education* 7(1):57-68

Bell, S. and Morse, S. 2004. Experiences with sustainability indicators and stakeholder participation: A case study relating to a "Blue Plan" project in Malta. *Sustainable Development* 12(1): 1-14

Bell, S. and Morse, S. 2008. Sustainability indicators - Measuring the immeasurable? (2nd edition). London: Earthscan.

Bello, A. D. 2006. Intangibles and sustainability in local government reports: An analysis into an uneasy relationship. *Journal of Intellectual Capital* 7(4): 440-456

Bebbington, J., Larrinaga, C. and Moneva, J. M. 2008. Corporate social reporting and reputation risk management. *Accounting, Auditing & Accountability Journal* 21(3): 337-361

Berg, B. 2004. Qualitatice reaserach methods. (5th edition). Toronto: Pearson Education.

Beringer, A. 2006. Campus sustainability audit research in Atlantic Canada: Pioneering the campus sustainability assessment framework. *International Journal of Sustainability in Higher Education* 7(4): 437-455

Blackburn, W. R. 2007. The Sustainability Handbook. Sterling, VA: Earthscan.
Bossel, H. 1996. Deriving indicators of sustainable development. *Environmental Modeling and Assessment* 1(4): 193-218

Bockstaller, C. and Girardin, P. 2003. How to validate environmental indicators. *Agricultural Systems* 76(2): 639-53

Brown, H.S., Jong, M. D. and Levy, D.L. 2009. Building institutions based on information disclosure: Lessons from GRI's sustainability reporting. *Journal of Cleaner Production* 17(6): 571-580

Brydon-Miller, M., Greenwood, D., and Maguire, P. 2003. Why action research? *Action Research* 1(1): 9-28

Bunting, T., Filion, P. and Walker R. (eds) Canadian cities in transition: New directions in the 21st century (4th edition). Toronto: Oxford University Press.

Canadian Securities Administrators. 2010. *CSA Staff Notice 51-333: Environmental Reporting Guidance*. Retrieved on June 3, 2011 from: http://www.osc.gov.on.ca/documents/en/Securities-Category5/csa_20101027_51-333_environmental-reporting.pdf

Clarke, A. and Kouri, R. 2009. Choosing an appropriate university or college environmental management system. *Journal of Cleaner Production* 17(11): 971-984

Cloquell-Ballester, V-A, Monterde-Diaz, R. and Santamarina-Siurana M-C. 2006. Indicators validation for the improvement of environmental and social impact quantitative assessment. *Environmental Impact Assessment Review* 26(1): 79-105

Cole, L. 2003. Assessing sustainability of Canadian university campuses: Development of a campus austainability assessment framework. Unpublished Master's Thesis. Victoria, Canada: Royal Roads University.

Commonwealth of Australia. 2000. A Framework for public environmental reporting: An Australian approach. Environment Australia. Canberra. Retrieved June 5, 2011 from: http://www.enviroreporting.com/others/Australian%20PER%20Guidelines.pdf

Connelly, S. and Roseland, M. 2010. *Black holes or white knights? Cities and the environment*, in Bunting, T., Filion, P. and Walker R. (eds) Canadian cities in transition: New directions in the 21st century (4th edition). Toronto: Oxford University Press.

Cortese, A. D. 2003. The critical role of higher education in creating a sustainable future. *Planning for Higher Education* 31(3): 15-22

COU. 2009. Ontario Universities: Committed to a Greener World. Retrieved November 20, 2010, from: http://www.cou.on.ca/issues-resources/key-issues/more/pdfs/committed-to-a-greener-world---a-pledge-from-execu.aspx

CPA Australia. 2007. Sustainability reporting in local government: Systemic change or greenwash? *CPA Australia Ltd*. Melbourne. Retrieved June 5, 2011 from: http://www.cpaaustralia.com.au/cps/rde/xbcr/cpa-site/sustainability-reporting-in-local-government.pdf

Creswell, J. W. 2008. Research design: Qualitative, quantitative, and mixed methods approaches (3rd edition). Thousand Oaks: Sage Publications, Inc.

Donnelly, A., Jones, M., O'Mahony, T. and Byrne, G. 2007. Selecting environmental indicator for use in strategic environmental assessment. *Environmental Impact Assessment* 27(2): 161-175

Eagan, D. J., Keniry, J., Schott, J., Dayananda, P., Jones, K. M. and Madry, L. 2008. Higher education in a warming world. Reston: National Wildlife Federation.

Environment Canada. 2010. *Global Warming Potentials*. Retrieved April 1, 2011 from: http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=CAD07259-1

Environment Canada. 2011. *Fuel Combustion*. Retrieved April 1, 2011 from: http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=AC2B7641-1

European Environmental Agency. 2005. *EEA core set of indicators, Guide.* EEA Technical Report No. 1. Retrieved April 10, 2011 from: http://www.eea.europa.eu/publications/technical_report_2005_1

Farneti, F. and Guthrie, J. 2009. Sustainability reporting by Australian public sector organizations: Why they report. *Accounting Forum* 33(2): 89-98

Ferreira, A. J. D., Lopes, M. A. R. and Morais, J. P. F. 2006. Environmental management and audit schemes implementation as an educational tool for sustainability. *Journal of Cleaner Production* 14(9-11): 973-982

Fisher R. M. 2003. Applying ISO 14001 as a business tool for campus sustainability: A case study from New Zealand. *International Journal of Sustainability in Higher Education* 4(2): 138-150

Five Winds International. 2003. Corporate social responsibility. Retrieved May 11, 201 from: http://www.fivewinds.com/english/resources/publications/corporate-social-responsibility-lessons-learned.html

Fonseca, A., Macdonald, A., Dandy E. and Valenti P. 2010. The state of sustainability reporting at Canadian universities. *International Journal of Sustainability in Higher Education* 12(1): 22-40

Freebairn, D.M. and King, C.A. 2003. Reflections on collectively working toward sustainability: Indicators for indicators! *Australian Journal of Experimental Agriculture* 43:223-238

Futerra Sustainability Communications, SustainAbility Ltd and KPMG International Cooperative. 2010. Reporting Change: Readers & Reporters Survey 2010. Retrieved May 25, 2011 from: http://www.kpmg.com/NZ/en/IssuesAndInsights/ArticlesPublications/Pages/reporting-change.aspx

Glaser, B. G., and Strauss, A. L. 1967. The Discovery of grounded theory: Strategies for qualitative research. Chicago: Aldine Publishing Company.

Global Reporting Initiative. 2006. *Sustainability Reporting Guideline*. Retrieved May 5, 2011 from: http://www.globalreporting.org/NR/rdonlyres/A1FB5501-B0DE-4B69-A900-27DD8A4C2839/0/G3_GuidelinesENG.pdf

Global Reporting Initiative. 2007. *Sustainability reporting 10 years on.* Amsterdam: Global Reporting Initiative. Retrieved May 5, 2011 from: http://www.globalreporting.org/NR/rdonlyres/430EBB4E-9AAD-4CA1-9478-FBE7862F5C23/0/Sustainability_Reporting_10years.pdf

Global Reporting Initiative (a). *Reporting framework overview*. Retrieved April 29, 2011, from: http://www.globalreporting.org/ReportingFramework/ReportingFrameworkOverview/

Global Reporting Initiative (b). *GRI reports list.* Retrieved April 29, 2011, from Global Reports Lists: http://www.globalreporting.org/ReportServices/GRIReportsList/

Grant, J.L. and Filion, P. 2010. *Emerging urban forms in the Canadian city*, in Bunting, T., Filion, P. and Walker R. (eds) Canadian cities in transition: New directions in the 21st century (4th edition). Toronto: Oxford University Press.

Group of 100. 2003. Sustainability: A guide to triple bottom line reporting. Group of 100 Incorporated. Melbourne. Retrieved June 5, 2011, from: http://www.group100.com.au/publications/G100_guide-tbl-reporting2003.pdf

Gustavson, K., Lonergan, S. and Ruitenbeek, H. 1999. Selection and modeling of sustainable development indicators: A case study of the Fraser River Basin, BC. *Ecological Economy* 28(1): 117-132

Hak, T., Moldan B., and Dahl, A. L. (editors). 2007. *Sustainability Indicators: A Scientific Assessment.* SCOPE. Washington: Island Press

Helferty, A. and Clarke, A. 2009. Student-led campus climate change initiatives in Canada. *International Journal of Sustainability in Higher Education* 10(3): 287-300

Herremans, I. and Allwright, D. E. 2000. Environmental management systems at North American universities: What drives good performance? *International Journal of Sustainability in Higher Education* 1(2): 168-181

Hodge, G. 2003. Planning Canadian communities: An introduction to the principles, practice, and participants (4th edition). Scarborough: Nelson.

Hodge, R.A. 1995. Assessing progress towards sustainability: Development of a systemic framework and reporting structure. Unpublished Ph.D. thesis, School of Urban Planning, Faculty of Engineering, McGill University, Montreal.

Hudson, B. M. 1979. Comparison of current planning theories: Counterparts and contradictions. *Journal of the American Planning Association*: 387-398

ICLEI. 1996. The Local Agenda 21 Planning Guide: An Introduction to Sustainable Development Planning. ICLEI/IDRC/UNEP. Toronto. Retrieved June 4, 2011 from: http://www.idrc.ca/openebooks/448-2/

International Standards Organization. *International Standards Organization*. Retrieved April 30, 2011, from About Us: http://www.iso.org/iso/about.htm

Ioannou, I., & Serafeim, G. 2011. *The consequences of mandatory corporate sustainability reporting.* Harvard Business School. Retrieved June 3, 2011 from: http://www.hbs.edu/research/pdf/11-100.pdf

James, S. and Lahti, T. 2004. The natural step for communities: How cities and towns can change to sustainable practices. Gabriola Island, BC: New Society Publishers.

Johnston, P., Everard, M., Santillo, D. and Robert, K.H. 2007. Reclaiming the definition of sustainability. *The International Journal of Life Cycle Assessment* 14(1): 60-66

Kemmis, S., and McTaggart, R. 2003 In Strategies of Qualitative Inquiry.

KPMG and Group of 100. 2008. Sustainability Reporting: A guide. Retrieved June 5, 2011, from: http://www.group100.com.au/publications/kpmg_g100_SustainabilityRep200805.pdf

Leeson, R., Ivers, J. and Dickinson, D. 2006. Sustainability reporting by the public sector: Momentum changes in the practice, uptake and form. *Special GRI-G3 Launch Conference Edition*: 56-59

Levett, R. 1998. Sustainability indicators: integrating quality of life and environmental protection. *Journal of the Royal Statistical Society* 161: 291-302

Lewin, K. 1946. Action research and minority problems. *Journal of Social Issues* 2: 34-46

Ling, C., Dale, D. and Hanna, K. 2007. A template for integrated community sustainability planning. *Environmental Management* 44(2): 228-242

Lozano, R. 2011. The state of sustainability reporting in universities. *International Journal of Sustainability in Higher Education* 12(1): 67-78

Maclaren, Virginia. 1996a. Developing indicators of urban sustainability: A focus on the Canadian experience. Report prepared for the State of Environment Directorate, Environment Canada; Canada Mortgage and Housing Corporation; and Intergovernmental Committee on Urban and Regional Research. ICURR Press, Toronto. Retrieved June 4, 2011 from: http://www.muniscope.ca/library/publications/index.php

Maclaren, V.W. 1996b. Urban sustainability reporting. *Journal of the American Planning Association* 62(2): 184-203

Maclean's. 2010. *Guide to Canadian Universities*. Toronto: Rogers Publishing Limited.

Maclean's. 2009. *Guide to Canadian Universities*. Toronto: Rogers Publishing Limited.

Maclean's. 2008. *Guide to Canadian Universities*. Toronto: Rogers Publishing Limited.

Mathews, M. R. 1997. Twenty-five years of social and environmental accounting research: Is there a silver jubilee to celebrate? *Accounting, Auditing & Accountability Journal* 10(4):481-531

Mitchell, G., May A. and McDonald, A. 1995. PICABUE: A methodological framework for the development of indicators of sustainable development. *International Journal of Sustainable Development & World Ecology* 2(2): 104-123

Mitchell, M., Curtis, A. and Davidson, P. 2008. Evaluating the process of triple bottom line reporting: Increasing the potential for change. *Local Environment* 13(2): 67-80

Mitchell, R. C. 2011. Sustaining change on a Canadian campus: Preparing Brock University for a sustainability audit. *International Journal of Sustainability in Higher Education* 1(7): 7-21

Neuman, W. 2007. Basics of social research: Qualitative and quantitative approaches (2nd edition). Boston: Pearson Education

O'Connor, M. and Spangenberg, J. H. 2008. Methodology for CSR reporting: Assuring a representative diversity of indicators across stakeholders, scales, sites and performance issues. *Journal of Cleaner Production* 16: 1399-1415

Orr, D. W. 2004. *The nature of design: ecology, culture, and human intention.* New York: Oxfrod University Press.

Patton, M. Q. 2002. Qualitative research and evaluation methods (3rd edition). Thousand Oaks: Sage Publications, Inc.

Pembina Institute. 2002. A conceptual framework for monitoring municipal and community sustainability in Canada. Retrieved June 4, 2011, from: http://www.anielski.com/Documents/Community%20Sustainability.pdf

Potts, T. 2004. Triple bottom line reporting: A tool for measuring, communicating and facilitating change in local communities. Conference Paper. Round Table on Sustainability and Social Science. Sydney. Retrieved June 23, 2011 from: http://www.environment.nsw.gov.au/resources/cee/tavispotts.pdf

Price T.J. 2005. Preaching what we practice: Experiences from implementing ISO 14001 at the University of Glamorgan. *International Journal of Sustainability in Higher Education* 6(2): 161-178

Rametsteiner, E., Pülzlb, H., Alkan-Olssonc, J. and Frederiksend, P. 2011. Sustainability indicator development: Science or political negotiation? *Ecological Indicators* 11(1): 61-70

Reed, M.S., Fraser, E.D.G and Dougill, A.J. 2006. An adaptive learning process for developing and applying sustainability indicators with local communities. *Ecological Economics* 59: 406-418

Robert, K. H., Schmidt-Bleck, B., Aloisi de Laderel, J., Basile, G., Jansen, J. L., Kuehr, R., Price Thomas, P., Suzuki, M., Hawken, P. and Wackernagel, M. 2002. Strategic sustainable development: Selection, design and synergies of applied tools. *Journal of Cleaner Production* 10: 197-214

Searcy, C., McCartney, D. and Karapetrovic, S. 2008. Identifying priorities for action in corporate sustainable development indicator programs. *Business Strategy and the Environment* 17: 137-148

Seasons, M. L. 2003. Monitoring and evaluation in municipal planning: Considering the realities. *Journal of the American Planning Association* 69(4): 430-440

Seasons, M. L. 2003a. Indicators and core area planning: Applications in Canada's mid-size cities. *Planning Practice and Research* 18(1): 63-80

Shriberg, M. 2002. Institutional assessment tools for sustainability in higher education: Strengths, weaknesses, and implications for practice and theory. *International Journal of Sustainability in Higher Education Policy* 3(3):153-167

Sierra Youth Coalition (a). 2009. Sustainable Campuses Annual Report 2008-2009. Retrieved March 14, 2011 from: http://www.syc-cjs.org/sites/default/files/Annual%20Report%202008-2009.pdf

Sierra Youth Coalition (b). 2009. Sustainable Campuses. Retrieved March 14, 2011 from: http://www.syc-cjs.org/sites/default/files/SYC-CSAF-core.pdf

Stafford, S. L. 2010. How green is your campus? An analysis of the factors that drive universities to embrace sustainability. *Contemporary Economic Policy*. Retried June 23, 2011 from: http://web.wm.edu/economics/wp/cwm_wp77rev1.pdf

Taddei-Bringas, J. L., Esquer-Peralta, J. and Platt-Carrillo, A. 2008. ISO 14001 and sustainability at universities: A Mexican case study. *Management of Environmental Quality: An International Journal* 19(5): 613-626

Tanguay, G., Rajaonson, J., Lefebvre, J.F. and Lanoie, P. 2009. Measuring sustainability of cities: A survey-based analysis of the use of local indicators. CIRANO. Scientific Publications No. 2009s-02. Retrieved June 4, 2011 from: http://webcache.googleusercontent.com/search?q=cache:http://www.cityfutures2009.com/PDF/29_Tanguay_George_A.pdf

Troschinetz, A. M., Mihelcic, J. R. and Bradof, K. L. 2007. Developing sustainability indicators for a university campus. *International Journal of Engineering Education* 23(2): 231-241

Turnhout, E., Hisschemoller, M. and Eijsackers, H. 2007. Ecological indicators: Between the two fires of science and policy. *Ecological Indicators* 7(2): 215-228

United Nations. 2011a. Department of Economic and Social Affairs. Retrieved April 29, 2011 from: http://www.un.org/esa/desa/aboutus/dsd.html#whoweare

United Nations. 2011b. Department of Economic and Social Affairs. Division for Sustainable Development. Retrieved April 29, 2011 from:

http://www.un.org/esa/dsd/dsd_aofw_ind/ind_index.shtml?utm_source=OldRedirect&utm_medium=redirect&utm_content=dsd&utm_campaign=OldRedirect

United Nations. 2011c. Department of Economic and Social Affairs. Division for Sustainable Development. Retrieved April 29, 2011 from: http://www.un.org/esa/dsd/agenda21/res_agenda21_28.shtml

United Nations. 2002. *Report of the World Summit on Sustainable Development, Johannesburg, South Africa.* New York: United Nations. Retrieved April 5, 2011 from: http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N02/636/93/PDF/N0263693.pdf?OpenElement

United Nations. 2007. *Indicators of sustainable development: Guidelines and methodologies* (3rd edition). New York: United Nations. Retrieved April 5, 2011 from: http://www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf

University of Waterloo. Annual Performance Indicators. Retrieved November 20, 2010 from: http://analysis.uwaterloo.ca/pubs/pi/PIReport_2010_FINAL.pdf

University of Waterloo. Financial Statements. Retrieved November 20, 2010 from: http://www.adm.uwaterloo.ca/infofin/Fin/2010.pdf

University of Waterloo. About Waterloo. Retrieved June 17, 2011 from: http://uwaterloo.ca/aboutuw/

University of Waterloo Daily Bulletin. 2009. Green: UW and other universities make pledge. Retrieved June 17, 2011 from: http://www.bulletin.uwaterloo.ca/2009/nov/30mo.html

Valentin, A. and Spangenberg, J. H. 2000. A guide to community sustainability indicators. *Environmental Impact Assessment Review* 20: 381-392

Velazquez, L. Munguia, N., Platt, A., and Taddei, J. 2006. Sustainable university: What can be the matter? *Journal of Cleaner Production* 14(9-11): 810-819

Viebahn, P. 2002. An environmental management model for universities: From environmental guidelines to staff involvement. *Journal of Cleaner Production* 10(1): 3-12

Walton, J., Alabaster, T. and Jones, K. 2000. Environmental accountability: Who's kidding whom? *Environmental Management* 26(5): 515-526

Walton, J., Alabaster, T., Richardson, S. and Harrison, R. 1997. Environmental reporting for global higher education institutions using the world wide web. *The Environmentalist* 17: 197-208

Waterloo Environment.Waterloo's SEED tops Corporate Knights sustainability ranking for third year. Retrieved November 20, 2010 from: http://www.environment.uwaterloo.ca/seed/documents/SEEDNewsReleaseJuly2010.pdf

Wells, W. C., Savanick, S. and Manning, C. 2009. Using a class to conduct a carbon inventory: A case study with practical results at Macalester College. *International Journal of Sustainability in Higher Education* 10(3): 228-238

Wheeler, S. M. 2004.Planning for sustainability: Creating livable, equitable, and ecological communities. New York: Routledge.

Wilson, J. T., Tyedmers P. and Pelot R. 2007. Contrasting and comparing sustainable development indicator metrics. *Ecological Indicators* 7(2): 299-314

World Commission on Environment and Development (WCED). 1987. *Our common future*. Oxford: Oxford University Press.

Wright, T. S. 2002. Definitions and frameworks for environmental sustainability in higher education. *International Journal of Sustainability in Higher Education* 3(3): 203-220

Appendix A
Our Path Forward Draft 1

The University of Waterloo is committed to sustainable development, which for us means "pursuing innovative strategies and activities that meet the needs of our employees, students, contractors and the communities in which we operate today, while protecting and enhancing the human and natural resources that will be needed in the future."

The University of Waterloo will continue to improve its overall sustainable development performance by committing to the following principles:

- **Environmental Responsibility:** minimize adverse environmental impacts of our operations and facilities.
- **Academic Leadership:** drive exemplary teaching, learning, research and collaboration to contribute to the advancement of knowledge in the area of sustainable development.
- **Students and Alumni:** create a sense of belonging during students' tenure of residence and as alumni.
- **Health and Safety:** provide a safe and healthy environment for our employees, students, contractors and visitors to campus.
- **Communication:** communicate with our stakeholders in a transparent and timely manner.
- **Diversity:** support a fair, respectful and diverse environment for our employees, students and contractors.
- **Community Engagement:** establish and maintain partnerships and relationships with governments, businesses, NGOs and the residents of communities in which we operate.

The University of Waterloo will periodically assess its performance relative to these sustainable development principles and report its findings publicly.

Appendix B
Our Path Forward Draft 2

Why Sustainable Development Reporting at the University of Waterloo?

In 2009, the University of Waterloo signed the *Ontario Universities Commitment to a Greener World* pledge, which committed the university to *"develop institutional environmental sustainability plans with measurable objectives"* and to *"publish an annual report documenting the efforts to modify operations in ways that are responsive to the threats of global climate change and environmental degradation."* Consistent with this commitment to global excellence, this first-ever Sustainable Development Report documents performance in reference to academic excellence, operational efficiencies, social and environmental stewardship.

Our Path Forward, as profiled below, provides the framework to assess the degree to which we meet these commitments and to aid in future goal-setting for sustainable development at the University of Waterloo.

Sustainable Development at University of Waterloo: Our Path Forward

Sustainable development for the University of Waterloo means pursuing strategies and activities that meet the needs of our students, employees, alumni and the communities in which we operate today, in a manner that enhances both the independent and the integrated relationships of the environment, society and economy.

The following principles will guide the University of Waterloo's sustainable development efforts:

Environmental Responsibility: minimize adverse environmental impacts, and identify means to protect and enhance the natural environment.

Economic Health: manage university resources with both short- and long-term prosperity in mind and contribute to the economic activity in the communities in which we operate.

Academic Excellence: drive exemplary teaching, learning, research and collaboration to contribute to the advancement of knowledge.

Social Leadership: promote healthy, diverse and equitable environment for our stakeholders.

Engagement and Transparency: engage and communicate with the stakeholders in an open and timely manner.

Hereby we commit to review and benchmark sustainable development performance congruent with these principles and share these findings publicly in an effort to drive towards best practices and innovation.

Appendix C

Sustainable Development Advisory Committee Email

Hello <name>,

This is Natalia Moudrak writing, a Masters of Planning student working with Dr. Blair Feltmate and Dr. Amelia Clarke at the University of Waterloo, Faculty of Environment. Thank you for agreeing to participate in our expert-team discussion on November 3, 2010.

We will be looking to obtain your advice on the 'sustainable development' definition, guiding principles and performance indicators for the *University of Waterloo Sustainable Development Report*.

I just wanted to provide you with the details of the event and its agenda:
- November 3, 2010
- 8.30 am to 2:30 pm
- St Paul's Boardroom (University of Waterloo Main Campus, St. Paul's Residence, please see directions at the end of the e-mail)

Agenda:

8:45 - 9:00 am: Coffee and Snacks (St Paul's Boardroom)
9:00 - 9:15 am: Introduction of the *University of Waterloo Sustainable Development Report* (Natalia)
9:15 - 9:30 am: Review of *'Our Path Forward'* – a draft statement outlining 'sustainable development' definition and guiding principles (Natalia)
9:30 - 10:00 am: Review of the indicators to support *'Our Path Forward'* principles (Natalia)
10:00 - 11:45 am: Team discussion of *'Our Path Forward'* – 'sustainable development' definition, guiding principles, and performance indicators
11: 45am - 12:20 pm: Catered Lunch
12:30 - 2:00 pm: Team discussion of *'Our Path Forward'* – 'sustainable development' definition, guiding principles, and performance indicators
2:00 – 2:30 pm: Summary of the team-discussion (Natalia)

I am attaching the '*Our Path Forward'* to this email for your review. The document contains the 'sustainable development' definition and principles that I have used as a guide for the conceptualization of the *Report*. Later I will be discussing the quantitative and qualitative indicators selected to measure each of the principles.

Here are the directions to St. Paul's residence:

St. Paul's University College
University of Waterloo
190 Westmount Road North
Waterloo, Ontario N2L 3G5

Google Maps Link:
http://maps.google.ca/maps?f=q&source=s_q&hl=en&geocode=&q=190+Westmount+Road+North,+Waterloo,+Ontario&sll=43.472745,-80.593193&sspn=0.00573,0.018539&gl=ca&ie=UTF8&hq=&hnear=190+Westmount+Rd+N,+Waterloo,+Waterloo+Regional+Municipality,+Ontario&ll=43.469148,-80.547338&spn=0.01224,0.037079&z=15

From Highway 401:
- Follow Highway 8 West to Highway 7 East. Be sure to take the exit for 7 East
- This takes you on to the "Conestogo Parkway"
- Stay in the left two lanes. Continue on the Parkway as it becomes Highway 85 North
- Exit at University Avenue West and drive about 2 miles till you pass the University of Waterloo on your right
- Continue to the next intersection (University and Westmont Rd.)
- Turn right on Westmount, and take the first driveway on the right
- Immediately turn left and go up the hill
- The second entrance on the right takes you into the main St. Paul's parking lot
- The wide paved walkway takes you to the main entrance of the College

I have arranged for a parking pass for you. It will be available at the reception desk in St. Paul's building.

Please let me know if you have any questions.

Once again, thank you for attending.
Warm Regards,
Natalia Moudrak
226-808-8770

Appendix D

Sample Introductory Email

Dear <name>,

This is Natalia Moudrak writing, a Master's of Planning student at the University of Waterloo, Faculty of Environment. <First and last name of a person> recommended writing to you. I am currently working on developing the first-ever sustainable development report for the University of Waterloo. The report aims to measure our environmental, social, economic and academic performance and is an initiative of the Faculty of Environment. My two supervisors are Dr. Amelia Clarke and Dr. Blair Feltmate from the School for Environment, Enterprise and Development (SEED).

I was wondering if you could help me obtain <needed information>. This information would be used to evaluate <economic/environmental/social> performance.

Please let me know if you could point me in the right direction. If you prefer to discuss this further on the phone or in person, just let me know and we could find convenient time.

Thank you very much.
Warm Regards,
Natalia Moudrak
226-808-8770

Appendix E

Interview Guide

Dear <name>,

How are you?

Thank you for making time to speak to me today, I appreciate it. Before we get into our discussion, I would like to provide you with some background information on the *University of Waterloo Sustainable Development Report 2010*. The report is an initiative of the University of Waterloo Faculty of Environment. My two supervisors are Dr. Amelia Clarke and Dr. Blair Feltmate from the School for Environment, Enterprise and Development (SEED). The aim of the report is to provide an up-to-date assessment of the University of Waterloo sustainable development performance. I am gathering information on our environmental, social, economic and academic performance and your area of expertise lies in <environmental/social/economic/academic> domain.

I was hoping to ask you the following questions:
- What in your view are the main success stories in this area of the University of Waterloo sustainable development performance?
- What are the main challenges?
- More specific questions and requests for data follow, as applicable to each interview.

<All the answers are jotted down on paper>

Thank you for sharing your insight and for your time in answering my questions. Would it be possible to email you a draft copy of the relevant the *University of Waterloo Sustainable Development Report 2010* section that you provided the information for? It would be great if you could take a look at it for verification purposes and make sure you are comfortable with the content. I am aiming to email you the section around <date>.

<All interviewees answered 'yes'>
<Conclude the interview>

Appendix F

List of Interviewee's Departments

Environmental Responsibility:

- Plant Operations
- Procurement and Contract Services
- St Paul's and St Grebel's University Colleges
- Faculty of Applied Health Sciences - Computing
- Faculty of Environment – Mapping, Analysis and Design

Social Leadership:

- Health Services
- Safety Office
- Organizational & Human Development
- Institutional Analysis and Planning
- Human Resources
- FEDs
- St Paul's University College

Economic Health:

- Finance and Administration
- Athletics
- Commercialization Office
- Central Stores

Academic Excellence:

- Co-operative Education and the Career Services
- Waterloo Institute for Sustainable Energy
- Schools of Pharmacy, Optometry, Environment, Enterprise and Development
- Student Life Office
- Student Success Office
- Housing and Residences

Appendix G

Comparison of CSAF, STARS and GRI Core Indicators

Please note that the following tables have been extracted from a Microsoft Excel file

Environment

CSAF - Core		STARS - Core		GRI - Core	
Energy					
E-1	Renewable Energy: Buildings	OP Credit 7	Building Energy Consumption	EN3	Direct energy consumption by primary energy source.
E-8	Reduction in Energy Consumption	OP Credit 8	Renewable Energy	EN4	Indirect energy consumption by primary source.
Water					
W-1	Potable Water Consumed	OP Credit 22	Water Consumption	EN8	Total water withdrawal by source.
W-7	Efficiency of Fixtures	OP Credit 23	Stormwater Management	EN21	Total water discharge by quality and destination.
W-9	Wastewater Produced				
Land/Grounds/Biodiversity					
L-1	Managed Greenspace	OP Credit 9	Integrated Pest Management	EN11	Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.
L-3	Pesticides	OP Credit 1	Building Operations and Maintenance	EN12	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas.
M-1	LEED Certified Base Buildings	OP Credit 2	Building Design and Construction (eg. LEED)		
Waste/Materials					
M-3	Paper Consumption	OP Credit 6	Food Purchasing (eg. composting)	EN1	Materials used by weight or volume.
M-4	Recycled Content of Paper	OP Credit 10	Computer Purchasing	EN2	Percentage of materials used that are recycled input materials.
M-7	Local Food Production	OP Credit 12	Office Paper Purchasing	EN22	Total weight of waste by type and disposal method.
M-9	Solid Waste and Recyclables Produced	OP Credit 13	Vendor Code of Conduct	EN23	Total number and volume of significant spills.
M-11	Recyclables Being Landfilled	OP Credit 17	Waste Reduction	EN26	Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation.
		OP Credit 18	Waste Diversion	EN27	Percentage of products sold and their packaging materials that are reclaimed by category.
		OP Credit 19	Construction and Demolition Waste Diversion		
		OP Credit 20	Electronic Waste Recycling Program		
		OP Credit 21	Hazardous Waste Management		
Air Quality					
A-7	Chemical Free Cleaning	OP Credit 11	Cleaning Product Purchasing	EN16	Total direct and indirect greenhouse gas emissions by weight.
E-4	Greenhouse Gas Emissions: Buildings	OP Credit 3	Indoor Air Quality	EN17	Other relevant indirect greenhouse gas emissions by weight.
E-5	Greenhouse Gas Emissions: Commuting Transport	OP Credit 4	Greenhouse Gas Emissions Inventory	EN19	Emissions of ozone-depleting substances by weight.
C-25	Affordability of Public Transit	OP Credit 5	Greenhouse Gas Emissions Reduction	EN20	NOx, SOx, and other significant air emissions by type and weight.
		OP Credit 14	Campus Fleet		
		OP Credit 15	Student Commute Modal Split		
		OP Credit 16	Employee Commute Modal Split		

Society

CSAF - Core		STARS - Core		GRI - Core	
Health					
HW-1	Recreation Space			LA7	Rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities by region.
HW-3	Diet Types			LA8	Education, training, counseling, prevention, and risk-control programs in place to assist workforce members, their families, or community members regarding serious diseases.
HW-5	Organic, Non-GMO, Fair Trade Food				
HW-9	Physical Health Care Practitioners				
HW-12	Mental Health Care Practitioners				
HW-17	Accessible Greenspace				
Equity and Diversity					
C-7	Faculty With Disabilities	PAE Credit 6	Diversity and Equity Coordination	HR4	Total number of incidents of discrimination and actions taken.
C-8	Staff With Disabilities	PAE Credit 7	Measuring Campus Diversity Culture	LA1	Total workforce by employment type, employment contract, and region.
C-9	Students With Disabilities	PAE Credit 8	Support Programs for Under-Represented Groups	LA2	Total number and rate of employee turnover by age group, gender, and region.
C-10	Faculty of Ethnic Minorities	PAE Credit 9	Support Programs for Future Faculty	LA4	Percentage of employees covered by collective bargaining agreements.
C-11	Staff of Ethnic Minorities	PAE Credit 10	Affordability and Access Programs	LA5	Minimum notice period(s) regarding significant operational changes, including whether it is specified in collective agreements.
C-12	Student of Ethnic Minorities			LA13	Composition of governance bodies and breakdown of employees per category according to gender, age group, minority group membership, and other indicators of diversity.
C-13	Faculty Gender			LA14	Ratio of basic salary of men to women by employee category.
C-14	Staff Gender				
C-15	Student Gender				
C-16	Equity of Indigenous Peoples: Faculty				
C-17	Equity of Indigenous Peoples: Staff				
C-18	Equity of Indigenous Peoples: Students				
Employee Training					
K-1	New Faculty Orientation	PAE Credit 13	Staff Professional Development in Sustainability	LA10	Average hours of training per year per employee by employee category.
K-4	Faculty Sustainability Training	PAE Credit 14	Sustainability in New Employee Orientation		
		PAE Credit 15	Employee Sustainability Educators Program		
		ER Credit 1	Student Sustainability Educators Program		
		ER Credit 2	Student Sustainability Outreach Campaign		
		ER Credit 3	Sustainability in New Student Orientation		
		ER Credit 4	Sustainability Materials and Publications		
Community Outreach					
		PAE Credit 19	Community Sustainability Partnerships	SO1	Nature, scope, and effectiveness of any programs and practices that assess and manage the impacts of operations on communities, including entering, operating, and exiting.
		PAE Credit 20	Inter-Campus Collaboration on Sustainability		
		PAE Credit 21	Sustainability in Continuing Education		
		PAE Credit 22	Community Service Participation		
		PAE Credit 23	Community Service Hours		

Economy

CSAF - Core		STARS - Core		GRI - Core	
EW-2	Student Debt Load	PAE Credit 16	Committee Socially Responsible Investment	EC1	Economic value generated and distributed, including revenues, operating costs, employee compensation, donations and other community investments, retained earnings, and payments to capital providers and governments.
EW-7	Wage Gap	PAE Credit 17	Shareholder Advocacy	EC2	Financial implications and other risks and opportunities for the organization's activities due to climate change.
EW-17	Ethically and Environmentally Sound Investments	PAE Credit 18	Positive Sustainability Investments	EC3	Coverage of the organization's defined benefit plan obligations.
EW-15	Locally Purchased Goods and Services	PAE Credit 11	Sustainable Compensation	EC4	Significant financial assistance received from government.
				EC6	Policy, practices, and proportion of spending on locally-based suppliers at significant locations of operation.
				EC7	Procedures for local hiring and proportion of senior management hired from the local community at significant locations of operation.
				EC8	Development and impact of infrastructure investments and services provided primarily for public benefit through commercial, in-kind, or pro bono engagement.

Academe

CSAF - Core		STARS - Core		GRI - Lozano	
Sustainability Courses					
K-17	Courses With Applied Learning	ER Credit 5	Sustainability Course Identification	CU1	Number and percentage (in respect to the total) of courses related to sustainability concepts
		ER Credit 6	Sustainability-Focused Courses	CU2	Number of students enrolled in sustainability-related courses
		ER Credit 7	Sustainability-Related Courses	CU3	Number of courses with some content on SD themes
		ER Credit 8	Sustainability Courses by Department	CU6	List with course titles and SD theme contained
		ER Credit 9	Sustainability Learning Outcomes	CU4	Specific course to 'Educate the Educators' in SD
		ER Credit 10	Undergraduate Program in Sustainability	CU7	Course structure, goals and duration
		ER Credit 11	Graduate Program in Sustainability	CU5	Management procedures to monitor incorporation of SD themes into Curricula
		ER Credit 12	Sustainability Immersive Experience	CU11	Number and percent of departments and colleges including sustainability courses and curricula
		ER Credit 13	Sustainability Literacy Assessment		
		ER Credit 14	Incentives for Developing Sustainability Courses		
Sustainability Research					
K-11	Research Collaboration - For Profit	ER Credit 15	Sustainability Research Identification	RE1	Research in the area of sustainability
		ER Credit 16	Faculty Involved in Sustainability Research	RE6	List issues addressed: Renewable energies, ecological economics, urban planning, etc
		ER Credit 17	Departments Involved in Sustainability Research	RE2	Percentage of graduate students doing research in sustainability
		ER Credit 18	Sustainability Research Incentives	RE7	List of knowledge field involved.
		ER Credit 19	Interdisciplinary Research in Tenure and Promotion	RE3	Percentage of faculty doing research in sustainability issues
				RE8	List of faculty members and Departments or Centres to which they belong
				RE4	Institutional support and management procedures for multidisciplinary and interdisciplinary research in sustainability
				RE5	Number of research projects that are multidisciplinary and interdisciplinary in the area of sustainability
				RE11	Total revenues from grants and contracts specifying sustainability-related research
				RE12	Published research with focus on sustainability-related issues
				RE13	Number and function of centres on campus providing sustainability-related research or services

Report surveys 'sustainable development'

by Kelley Teahen, communications and public affairs

A new report on sustainable development at the University of Waterloo is part of the university's commitment to the Council of Ontario Universities sustainability pledge, *Ontario Universities: Committed to a Greener World*, says President Feridun Hamdullahpur.

The *University of Waterloo Sustainable Development Report*, released this month, began its life in summer 2010 in response to a direction from the Dean's Advisory Council in the Faculty of Environment to create such a report, which has been done in many other Canadian universities.

Master's student Natalia Moudrak gathered the research, working closely with staff across campus, including Plant Operations. The document is now on the university's sustainability web site.

An advisory committee reviewed her initial draft and, to make the report consistent with the COU sustainability pledge commitments, it was organized to document the university's sustainable development performance according to the following four areas:

Environmental responsibility: minimize adverse environmental impacts and identify means to protect and enhance the biophysical environment.

Social leadership: promote a healthy, equitable, diverse and just environment that supports the wellbeing of our community.

Economic health: manage university resources for both short- and long-term prosperity and contribute to the economic health and vitality of the communities in which we operate.

Academic excellence: spearhead exemplary teaching and research to contribute to the advancement of knowledge.

The report looks at both key performance successes, and key challenges in each area, and makes a series of recommendations. Among them:

- Implementing individual building energy and water metering

- Undertaking a new waste audit
- Devising a strategy to reduce carbon dioxide emissions
- Developing strategies to lower employee injury frequency and injury severity rates
- Implementing programs to officially recognize student non-academic involvement and boost student engagement

Hamdullahpur has provided a foreword for the report, and says the university commits "to review and benchmark sustainable development performance congruent with the *Ontario Universities: Committed to a Greener World* pledge and to share findings publicly. We welcome your feedback on the report and encourage an open, participatory, and responsive decision-making environment that engages all members of our community.

"For us, sustainable development means pursuing strategies and activities that meet the needs of our students, employees, alumni and the communities in which we operate, in a manner that enhances both the independent and the integrated relationships of the environment, society and the economy today and into the future."

Appendix I
University of Waterloo Sustainable Development Report 2010

Please see the document attached for the final formatted version of the *University of Waterloo Sustainable Development Report 2010*.

UNIVERSITY OF
WATERLOO

Sustainable Development Report 2010

About the University of Waterloo

The University of Waterloo is located at the heart of Canada's Technology Triangle and is one of Canada's leading comprehensive universities. Founded in 1957, the university is now home to 30,000 students, 3,000 staff and faculty members and the largest post-secondary co-operative education program in the world. The University of Waterloo supports enterprising partnerships in learning, research and discovery and has been named Canada's most innovative university in the *Maclean's** annual university rankings for 19 years in a row since 1991.

University of Waterloo Main Campus
200 University Avenue West,
Waterloo, Ontario, N2L 3G1, Canada
[1 hour 20 minutes drive west of Toronto]

University of Waterloo Main Campus
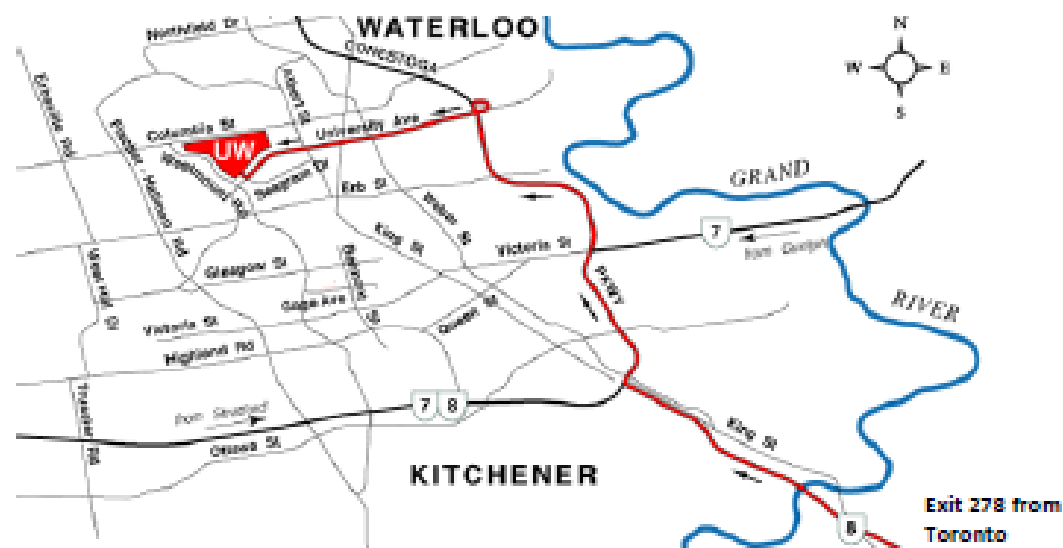
* *Maclean's is Canada's weekly current affairs magazine. Since 1991, the magazine has produced annual rankings of all Canadian universities.*

Message from the President

.

In 2009, the University of Waterloo signed the Council of Ontario Universities sustainability pledge, *Ontario Universities: Committed to a Greener World*. By signing this pledge, the university accepted the responsibility "to assist in finding solutions to the challenges of environmental sustainability; to share knowledge about sustainability and climate change; and to incorporate, wherever possible, principles of sustainability into our own operations."

For us, sustainable development means pursuing strategies and activities that meet the needs of our students, employees, alumni and the communities in which we operate, in a manner that enhances both the independent and the integrated relationships of the environment, society and the economy today and into the future.

Consistent with Council of Ontario Universities sustainability pledge commitments, the *University of Waterloo Sustainable Development Report 2010* documents the university's sustainable development performance according to the following four areas:

Environmental responsibility: minimize adverse environmental impacts and identify means to protect and enhance the biophysical environment.

Social leadership: promote a healthy, equitable, diverse and just environment that supports the well-being of our community.

Economic health: manage university resources for both short- and long-term prosperity and contribute to the economic health and vitality of the communities in which we operate.

Academic excellence: spearhead exemplary teaching and research to contribute to the advancement of knowledge.

We commit to review and benchmark sustainable development performance congruent with the *Ontario Universities: Committed to a Greener World* pledge and to share findings publicly. We welcome your feedback on the report and encourage an open, participatory, and responsive decision-making environment that engages all members of our community.

Feridun Hamdullahpur
President, University of Waterloo
August 2, 2011

About the Report

Report Scope

Reporting period: January 1 to December 31 2010, or 2009/10 fiscal year, as specified.

Reporting boundary: the University of Waterloo main campus, including federated university and affiliated colleges, unless otherwise noted.

Performance benchmarking: internal trends over a five-year period from 2006 to 2010 calendar years, or from 2005/06 to 2009/10 fiscal years, where applicable.

NOTE: all monetary values expressed in the report are in Canadian dollars ($)

Contents

Advisory Committee

The Sustainable Development Advisory Committee profiled below provided input on the report's format and contents. The committee consisted of experts from industry, non-governmental organizations (NGOs), consultancy, government and academia:

- Amelia Clarke, *Assistant Professor*, Faculty of Environment, University of Waterloo

- Ashlea Hegedus-Viola, *Undergraduate Student*, University of Waterloo

- Blair Feltmate, *Associate Professor*, Faculty of Environment, University of Waterloo

- Danielle Avila, *Coordinator*, University of Waterloo Sustainability Project

- David Roewade, *Environmental Sustainability Planner*, Region of Waterloo

- Jonathan Pinto, *Master's Student*, University of Waterloo

- Mike Morrice, *Executive Director*, Sustainable Waterloo

- Nelson Switzer, *President and Chief Sustainability Officer*, Asherleaf Consulting Inc.

- Peter Johnson, *Corporate Consultant*, Johnson and Associates

- Sandi Stride, *President and CEO*, EcoStride Group

111

Key Performance Highlights

Success Stories

· Annual water consumption at the University of Waterloo main campus decreased by 35 per cent between 2005/06 and 2009/10 fiscal years.

· Annual energy consumption per m² of heated and cooled space decreased by three per cent, although nearly 89,000 m² of new building space requiring heating and cooling was added between 2005/06 and 2009/10 fiscal years.

· LEED platinum design of the Environment 3 building makes the University of Waterloo one of only two places in Waterloo Region to demonstrate such commitment to green building design and construction.

· National leadership in research activity was recognized by Research Infosource's "Canada's Top 50 Research Universities" survey that ranked the University of Waterloo as the number one comprehensive research university in Canada for the third year in a row since 2008.

· Canada's oldest co-operative education program continues to grow at the University of Waterloo, now assisting more than 16,000 students annually in finding co-op employment.

· Student Leadership Certificate Program offered through the University of Waterloo Organizational & Human Development (OHD) office provided more than 5,000 undergraduate and graduate students with leadership learning since its inception in 2008.

Outstanding Challenges

· Individual building energy and water metering could aid the University of Waterloo in assessing the effectiveness of efficiency improvements per building.

· Undertaking a new waste audit could provide details on the effectiveness of the recycling efforts since the Region of Waterloo assumed the blue box recycling program in 2008.

· Reducing CO_2 emissions would minimize the university's environmental footprint.

· Lowering employee injury frequency and injury severity rates through improved internal processes would advance the university's health and safety track record.

· Increasing student engagement could help maintain higher student retention rates and ensure a more substantive university experience.

· Ongoing sustainable development reporting and planning could help fulfil the *Ontario Universities: Committed to a Greener World* pledge.

Environmental Responsibility

The University of Waterloo's commitment to sustainable development is reflected in its effort to minimize adverse environmental impacts from operations, while accommodating a growing student population and ongoing campus expansion. Reducing energy and water consumption, ensuring environmentally responsible land use, striving to improve waste management and lowering CO_2 emissions are key areas of the university's environmental focus.

Key performance areas:

- Energy
- Water
- Land use
- Waste management
- CO_2 emissions

Environmental Responsibility

| Energy | Water · | Land Use | Waste Management | CO_2 Emissions |

Annual energy consumption at the University of Waterloo main campus rose 14 per cent over 2005/06 and 2009/10 fiscal years (Figure 1). However, nearly 89,000 m^2 of new building space requiring heating and cooling was added over the same period. On a per m^2 basis, three per cent less energy was used to heat and cool university buildings in the 2009/10 fiscal year when compared to 2005/06 (Figure 2). University of Waterloo Plant Operations attributes this performance to the following:

· An advanced building automation system, which allows for real-time adjustments to the ventilation and temperature in buildings based on room occupancy

· A heat recovery system at the central utilities plant, which captures the heat that otherwise would be vented up the stack and uses it to reduce the overall energy use of the steam plant

· Ongoing campus-wide energy retrofits, which include energy-efficient lighting fixture installations and air conditioning systems upgrades

· Requirement that all newly constructed buildings conform to the Leadership in Energy & Environmental Design (LEED)* silver standard for mechanical and electric systems

Figure 1: University of Waterloo Annual Energy Consumption (Main Campus)
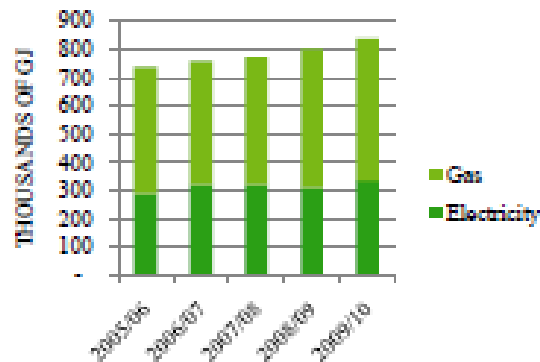
Figure 2: University of Waterloo Annual Energy Consumption per m^2 (Main Campus)

Leadership in Energy and Environmental Design (LEED) is a globally recognized building certification system. Administered by the Canada Green Building Council (CaGBC), the system assesses how well the building measures up in terms of sustainable site development, water efficiency, energy efficiency, choice of materials and indoor environmental quality, as well as "innovation and design process." There are four levels of certification: certified, silver, gold and platinum.
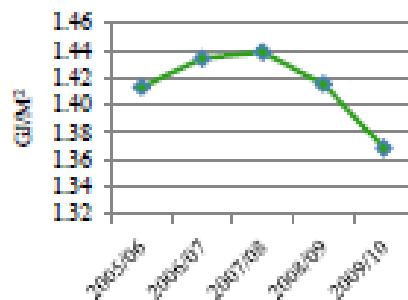
Environmental Responsibility

| Energy | Water | Land Use | Waste Management | CO₂ Emissions |

Energy Metering

Individual building energy metering has been implemented at St. Jerome's University and Conrad Grebel, Renison, and St. Paul's university colleges located on the University of Waterloo main campus. Individual building energy metering helps monitor energy efficiency improvements and makes residence energy reduction competitions possible across these institutions.

Ring Road Lighting Retrofit

To further reduce energy consumption on the University of Waterloo main campus, a retrofit to the lighting system along the Ring Road was initiated in 2010. All 150-watt high-pressure sodium lights that circle 2.65 km of main campus along the Ring Road will be replaced by more efficient 70-watt induction lights. When completed in 2011, the retrofit will not only save energy, but will also result in a better-quality white light along the Ring Road.

CASE 1: Solar Grebel

In December 2010, three thermal solar arrays were installed on the roof of Conrad Grebel University College to preheat its domestic hot water supply (see photo to the right).

A student-led group called Solar Grebel spearheaded this initiative. The students gained valuable experience from ensuring the support of Grebel administrators for the project, researching the idea, writing the Request-for-Proposals, selecting a supplier of the water heating system, and applying for grants.

The three panels will produce the equivalent of 7.8 megawatt hours of energy, which will lead to savings of 940 cubic metres of gas annually - about 14 per cent of Grebel's current load. Additionally, Grebel's CO₂ emissions will be reduced by 1,981 kilograms per year.

Environmental Responsibility

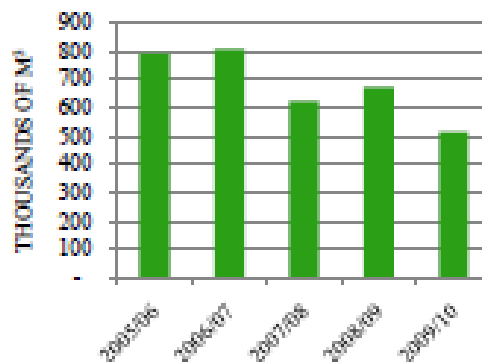| Energy | Water | Land Use | Waste Management | CO_2 Emissions |

The University of Waterloo's annual water consumption on main campus has declined by 35 per cent between the 2005/06 and 2009/10 fiscal years (Figure 3). The following factors explain this trend:

· Ongoing campus-wide water retrofits, which include water-saving fixture installations

· Closed-loop re-circulating systems in the cooling towers and laboratories

· Biology 1 fish laboratory retrofit in 2008, which resulted in average annual water savings of 19,000 m³

Water Metering

Individual building water metering has been implemented at St. Jerome's University and Conrad Grebel, Renison, and St. Paul's university colleges at the University of Waterloo main campus. Individual building water metering could be instrumental going forward to monitor individual water conservation efforts.

Figure 3: University of Waterloo Annual Water Consumption (Main Campus)

NOTE: the university assumes the amount of waste water discharged is equivalent to the amount of water consumed as per Figure 3.

Environmental Responsibility

| Energy | Water | Land Use | Waste Management | CO₂ Emissions |

The University of Waterloo Main Campus

The University of Waterloo has a total of 1,100 acres in land holdings, with the majority of academic buildings, residences and administrative offices concentrated on the 300-acre south portion of the main campus. The University of Waterloo Campus Master Plan illustrates the university's commitment to sustainable land use. The plan was updated in 2009 to provide direction on ways to accommodate new growth while preserving, enhancing, and expanding the quality and integrity of campus and its natural environment.

The main campus boasts such environmental features as Laurel Creek, perennial gardens, and abundant natural green spaces. All new trees and shrubs planted on the main campus are species native to southern Ontario. To protect natural habitats from harmful chemicals, cosmetic pesticides are no longer used on university property, except for occasional applications on sports fields. Aeration, irrigation and fertilization ensure healthy turf and a hot-water spray system is used to eliminate weeds from the university's sidewalks, parking lots and roads.

David Johnston Research and Technology Park

Named after the university's former president, the David Johnston Research and Technology Park is one of the newest research parks in Canada. Located in the northern portion of the main campus, the Research and Technology Park was designed to accommodate 1.2 million square feet of office space on a 120-acre lot. Enterprises like Sybase, Open Text Corporation, and AGFA, as well as the Accelerator Center that houses local technology start-ups, are housed at the park.

The University of Waterloo Environmental Reserve

Also located in the northern portion of the main campus, the 109-acre University of Waterloo environmental reserve is home to birds and wildlife. Columbia Lake, redesigned to allow for cooling of Laurel Creek, serves as a year-round warm-water sportfish habitat. Riparian buffer, bioswales (vegetated open channels specifically designed to attenuate and treat stormwater runoff), detention ponds and stormwater management ponds further enhance the area's environmental attributes.

Perennial garden outside Biology I Greenhouse, University of Waterloo Main Campus

Environmental Responsibility

CASE 2: Environment 3 LEED Construction

Scheduled to open for classes in September 2011, the 57,000-square-foot Environment 3 building will serve as a model of green design and construction on the University of Waterloo main campus. Expanding over the existing Environment 2 building, the facility will house the School of Planning and the School of Environment, Enterprise and Development (SEED).

The Environment 3 building is on track to achieve the highest LEED certification with its comprehensive environmental design features, including:

- **Energy efficiency**: extensive insulation, high-efficiency lighting, and in-floor heating that recycles heat from computers

- **Water conservation**: rainwater recycling systems and high-efficiency washroom fixtures

- **Air quality**: two-storey living wall, connected to the HVAC system

- **Green roof**: accessible native species garden to serve as a relaxing space for students, staff and faculty

*The Construction of the Environment 3 Building,
University of Waterloo Main Campus*

Environment 3 Atrium Ceiling

118

Environmental Responsibility

| Energy | Water | Land Use | Waste Management | CO₂ Emissions |

On-Campus Recycling

The University of Waterloo participates in the Region of Waterloo blue box recycling program. As a participant, the university has designated recycling areas within every building on the main campus, equipped with two types of blue box containers to separate:

· Newsprint, magazines, boxboard, other paper fibres (except corrugated) and plastic retail bags

· Glass, aluminum, plastics, tinfoil, rigid plastic containers, tetrapak and other materials

Organic Waste

The Region of Waterloo green bin program was introduced at the Conrad Grebel University College cafeteria in 2010. The cafeteria was chosen as a pilot site by the region to determine the feasibility of a food waste collection program within a campus setting. In 2010, St. Jerome's University was the only other campus participant that has implemented an organic waste collection program.

Diversion Rates

A waste audit performed by Waste Services Inc. determined that the university's annual diversion rate was 24 per cent in 2008. The audit found that this rate could be increased to 39 per cent through additional student and staff education and improvements in internal processes. For example, the university may wish to reduce the growing amount of cardboard waste produced on the main campus (Figure 4) and the amount of organic waste being landfilled.

Figure 4: University of Waterloo Annual Waste Production (Main Campus)
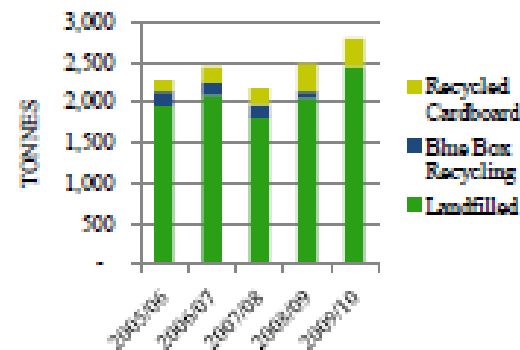
NOTE: Figure 4 does not reflect the diversion of electronics and office paper through the white box program (discussed on page 13), as the university is reimbursed for recycling of these materials.

The apparent reduction in blue box recycling is due to the university no longer tracking the amount of recyclables diverted through the program since the Region of Waterloo assumed the collection of blue box recycling in November 2008.

Environmental Responsibility

White Box Program

The white box program is focused solely on the collection of office paper used for the university's photocopiers and printers. In 2010, 153 tonnes of office paper were sent from the University of Waterloo Central Stores to the Metro Waste Paper Recovery plant in Scarborough for reprocessing. This is a closed loop* Recovery Plus program offered through a subsidiary of Cascades Inc., the supplier of the majority of office paper used on campus.

Production system in which the waste or by-product of one process or product is used in making another product.

Procurement

There are several ways in which the University of Waterloo Procurement and Contract Services office practices environmentally responsible purchasing decisions:

· Request-for-Proposals specify sustainability and environmental considerations as part of the vendor selection process

· Post-consumer recycled paper content was present in 42 per cent of the university's fine paper purchases in 2010 (Figure 5)

Figure 5: University of Waterloo Annual Office Paper Consumption (Main Campus)
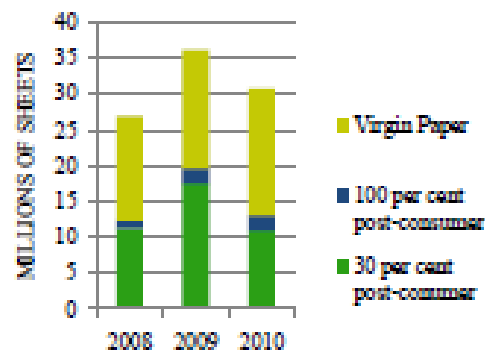
· Washrooms across campus are stocked with 100 per cent post-consumer recycled paper towels and toilet tissue

· A cost-benefit study was distributed by the University of Waterloo Procurement and Contract Services office to encourage the purchasing of "green" products. The study found "green" products financially comparable to the "non-green" products.

Environmental Responsibility

| Energy | Water | Land Use | Waste Management | CO₂ Emissions |

CASE 3: Green IT

In March 2010, the University of Waterloo Executive council approved the Green Information Systems and Technology Statement (Green IT). Green IT Guiding Principles and Suggested Strategies promote sustainable acquisition, ongoing use and disposal of IT devices on campus. Below are some of the Green IT initiatives implemented at the University of Waterloo Faculty of Applied Health Sciences (AHS) and Faculty of Environment.

Power-Saving Initiatives:

· Computer laboratory machines automatically shut down at 11 pm if the machines are idle; machines automatically start up the following morning before classes begin

· Laboratory printers are set to go into sleep mode

Paper-Saving Initiatives:

· 100 per cent post-consumer recycled paper is used in the computer laboratory printers; default double-sided printing settings have been implemented

· Signs are posted in the laboratories to encourage responsible printing

· Annual paper consumption is tracked within the Faculty of Environment to evaluate the effectiveness of paper-saving initiatives; a total reduction of seven per cent was achieved between 2009 and 2010

· Developed by SPRANQ, Ecofont is a font that uses up 20 per cent less ink during printing. AHS Computing has made Ecofont available for download on their website: http://ahsco.uwaterloo.ca/green/printing.html

NOTE: Ecofont was used for the headers of this report.

Other Green IT initiatives already occurring at the University of Waterloo main campus include double-sided printing at the university libraries, which was implemented in 2004. The university may encourage document scanning as opposed to photocopying and printing to further promote paper conservation. Currently, Media.doc centres offer document scanning services on the University of Waterloo main campus.

Environmental Responsibility

| Energy | Water | Land Use | Waste Management | CO₂ Emissions |

CASE 4: St. Paul's Environmental Leadership

St. Paul's Compass Award

In 2010, St. Paul's cafeteria, Watson's Eatery (see photo below), received the Green Dining Award from Compass Group Canada* for its commitment to sustainability. Watson's Eatery offers a "balanced choices" menu to promote healthier eating, serves Planet Bean fair-trade organic coffee and does not permit the sale or use of bottled water anywhere on its premises. Staff working at Watson's Eatery keep temperature logs on the equipment, turn it off when not in use, and report on the weekly amount of waste produced in the kitchen. Furthermore, single-use utensils and plates were eliminated from Watson's Eatery catering services.

Compass Group Canada is one of Canada's Top 100 Greenest Employers and has more than 2,000 food service provider accounts. To date, only five accounts were recognized with the Green Dining Award.

Residence Reduction Challenge Winner

Organized in 2008 by Sierra Youth Coalition's Sustainable Campuses Project, the Residence Reduction Challenge competition aimed to encourage students living at the University of Waterloo, University of Guelph and Queen's University residences to conserve energy and water and to reduce waste. St. Jerome's University and Conrad Grebel, Renison, and St. Paul's university colleges represented the University of Waterloo. St Paul's residence won the competition, reducing its water and energy use by 62 and four per cent respectively.

Environmental Responsibility

| Energy | Water | Land Use | Waste Management | CO_2 Emissions |

Since 2005, the University of Waterloo has participated in the Region of Waterloo Partners for Clean Air program to improve outdoor air quality by reducing harmful emissions. Annual carbon dioxide (CO_2) emissions from purchased electricity, the burning of natural gas at the boiler plant, and landfilling of waste produced on campus are reflected in Figure 6.

Examples of initiatives to reduce atmospheric emissions on the University of Waterloo main campus include:

· **Replacing air conditioning units** with those that are high-efficiency and CFC-free

· **Introducing a universal bus pass** for all registered students, thus lowering CO_2 emissions through greater transit use

· **Encouraging bicycle use** by providing bicycle racks throughout the main campus

Figure 6: University of Waterloo Annual CO_2 Emissions by Source (Main Campus)
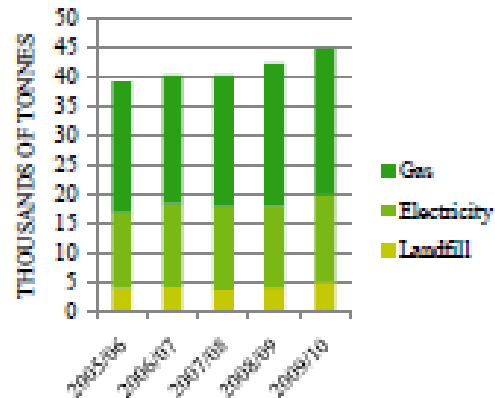
NOTE: The data above was estimated using emission factors from Environment Canada:

· 1,879 grams of CO_2 per m³ of natural gas

· 160 grams of CO_2 per kWh of electricity

· 83 kilograms of methane per tonne of municipal solid waste, with every kilogram of methane equivalent to 25 kilograms of CO_2

Please refer to:

· http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=AC2B7641-1

· http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=CAD07259-1

Social Leadership

University of Waterloo students, staff and faculty all have distinctive backgrounds, values and experiences, which collectively comprise a multi-cultural and diverse community. In 2010, there were close to 3,000* staff and faculty members working at the university. More than 28,000* students, including approximately 3,500* graduate and 3,400* international students were enrolled at the university the same year. Commitment to health and diversity, as well as promotion of equity and personal development, is pivotal for the well-being of the University of Waterloo community today and in the future.

Key Performance Areas:

- Health
- Diversity
- Employment equity
- Personal development

* Full-time equivalent

Social Leadership

| Health | Diversity · | Employment Equity | Personal Development |

Student Health

Health Services is located on the University of Waterloo main campus. It serves as the first aid station for university employees and visitors, a public health flu immunization clinic open to the community during the flu season, and a primary destination for all registered students requiring medical care. In 2010, there were more than 58,000 visits recorded at Health Services (Figure 7), with most patients seeking attention from a physician or a nurse. Other services sought were allergy injections, birth control pill pick-ups, mental health services and psychiatric consultation.

While the main focus of Health Services is to provide medical care for students, the occupational health nurse provides support to university staff and faculty. Assistance with returns to the workplace after an illness or injury, referrals to the Employee Assistance Program, individual counselling and immunization recommendations are among the services available to staff and faculty.

To enhance patient profiling and to reduce its environmental footprint, Health Services has implemented an electronic medical records system. The new system allows for a comprehensive view of patients' medical history and reduces the amount of paper stock at the clinic.

Figure 7: University of Waterloo Annual Visits to Health Services by Destination
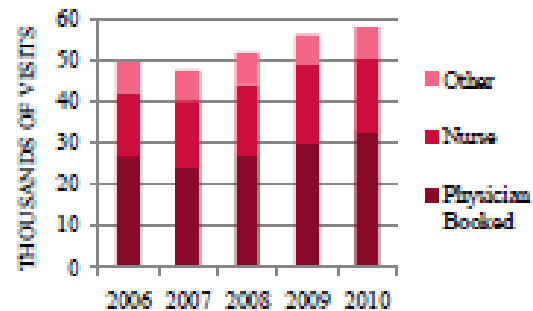
NOTE: Figure 7 does not reflect visits to the laboratory and dietitian consultations. Cancellations are included under Other.

A change underway in 2011 is the construction of a state-of-art extension to Health Services that will double the size of the facility's functional space. A family clinic for students and local community members with dependents will be one of the services added.
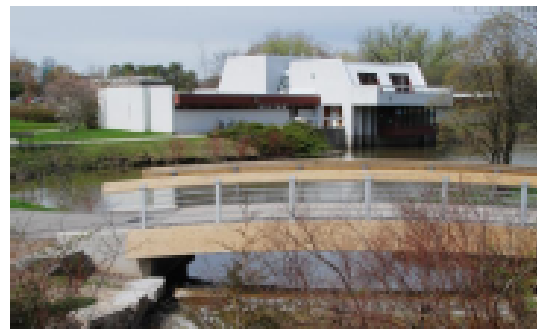
Health Services, University of Waterloo Main Campus

Social Leadership

| Health | Diversity | Employment Equity | Personal Development |

Employee Health

The Workplace Safety and Insurance Board (WSIB) injury frequency and injury severity rate information provides a benchmark against which the state of the University of Waterloo's employee health can be compared to persons working in similar occupations*. The university belongs to the WSIB Rate Group 817, comprised of other universities, libraries and museums in Ontario. Generally, universities have the highest injury frequency and injury severity rates in this rate group.

The University of Waterloo tends to have proportionally more employees in higher-risk areas such as food operations and custodial services than other universities that contract these services out. For this reason, its injury frequency rates (Figure 8) and injury severity rates (Figure 9) have been higher than the rate group's average. Slips and trips, burns, repetitive strains and bumps from heavy objects are among the most common incidents.

It is also important for the university to maintain a good health and safety record compared to the rate group to earn rebates on WSIB insurance premiums and to avoid assessed surcharges for poor performance. The university aims to reduce injury frequency rates by providing employees with extensive health and safety training and to lower injury severity rates by helping employees to return to work seamlessly after an injury.

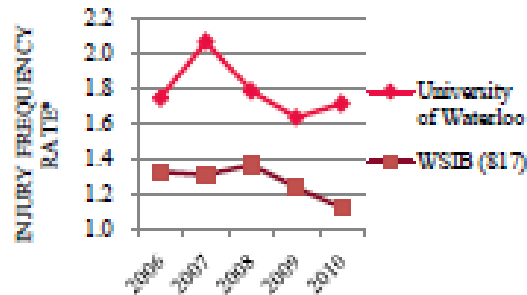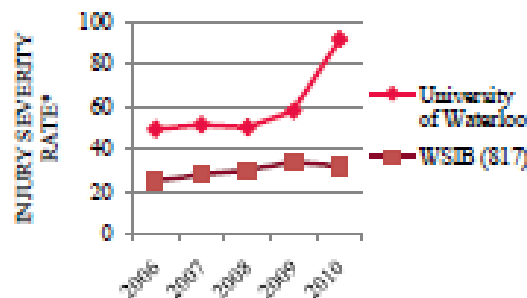**Figure 8: University of Waterloo Annual Injury Frequency Rates**

Figure 9: University of Waterloo Annual Injury Severity Rates

* The WSIB injury frequency rate is measured as the number of injuries for each 200,000 hours worked by employees. The injury severity rate counts the work days lost, regardless of injury date, per 100 full-time equivalent workers or 200,000 hours worked.

126

Social Leadership

The One Waterloo Campaign

Created in 2005 and managed by the Federation of Students, the University of Waterloo's One Waterloo Campaign offers events and programs designed to educate students about diversity, promote inclusivity on campus and create a safe space for students to dialogue and learn about problems of discrimination and intolerance. The campaign envisions a campus where differences are not just recognized, but celebrated. The One Waterloo Campaign is the host for annual events such as International Celebrations Week, Black History Month, and Ability Awareness. Additional activities are developed each year based on input from students, the campaign's steering committee and the campaign's student leaders.

GLOW - The Queer and Questioning Community Centre

Established in 1971 at the University of Waterloo, GLOW is the "longest-running campus queer organization in Canada." GLOW is committed to promoting inclusion and providing safe spaces to the campus community regardless of sexual orientation or gender identity.

Aboriginal Services Centre

In 2010, St. Paul's University College began the construction of a dedicated space for the University of Waterloo's Aboriginal students and Aboriginal programs. The new space will house Aboriginal Services, a lecture hall, staff offices and meeting rooms, as well as the Aboriginal Services Centre (ASC). A large seminar room, kitchen, storage, small library with computer work stations and offices for staff and the visiting Elders In Residence program will be available at the ASC.

The SHADOW Program for International Students

The SHADOW Program works by pairing up a new international student with a University of Waterloo student volunteer who is accustomed to the university campus, services and local community. International students usually meet with their "shadow" for the first time at the beginning of the academic term, maintain weekly telephone contact and get together in person at least two times each month. The aim of the program is to help international students get familiar with the services on campus and the local areas and make friends.
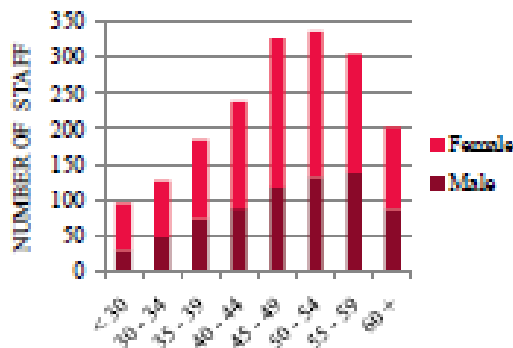
Social Leadership

Health | Diversity · | Employment Equity | Personal Development

The University of Waterloo is a voluntary complier under the Federal Contractors Program established under the Canadian Employment Equity Act to achieve workplace equity for women, Aboriginal peoples, persons with disabilities and members of visible minorities. The University of Waterloo Human Resources department collects equity information from new employees at the time of hire. Currently, information on staff and faculty employment by gender and age is being reported. In 2010, over 60 per cent of staff and 25 per cent of faculty employed at the university were female. In the same year, 46 per cent of staff and 42 per cent of faculty were 50 years of age or older (Figure 10 and Figure 11). This is consistent with Ontario's aging population trend.

Figure 10: University of Waterloo Staff Gender and Age Distribution (2010)

Figure 11: University of Waterloo Faculty Gender and Age Distribution (2010)
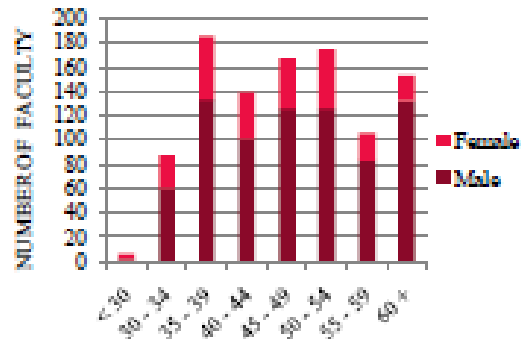
In 2010, the Human Resources department has implemented a new recruitment module, enabling the university to monitor such equity data as the percentage of Aboriginal peoples, persons with disabilities and members of visible minorities employed at the university on a level not possible in the past.

Social Leadership

The Centre for Career Action

The Centre for Career Action provides confidential career advising to all University of Waterloo staff, students and alumni. Workshops and an online Career Development Manual (CDM) provide help with self assessments, researching occupations, career decision-making, work search and networking, obtaining interview skills and negotiating job offers. The centre also assists University of Waterloo students and alumni to obtain part-time, summer, and full-time jobs.

Staff and Faculty Training

All University of Waterloo staff and faculty are required to complete Employee Safety Orientation and Workplace Violence and Harassment Awareness training. In addition, staff and faculty are also required to fulfill customer service training offered through the persons with disabilities office as part of the Ontarians with Disabilities Act requirements.

In May 2010, the Vice-President Academic & Provost, along with Deans' Council, mandated a two-day workshop on budget-keeping, compliance, faculty policies, and performance measurement for all new department chairs and heads. Moreover, Policy 18 was updated in September 2010, to specify that all university staff are entitled to up to 30 hours of training annually for personal and professional development. Supervisors are expected to encourage staff to use

the 30 hours offered. The annual Staff Conference, hosted by the University of Waterloo Organizational & Human Development (OHD) office in April, is one avenue to receive such training. In 2010, more than 1,000 staff participated in a series of workshops and lectures offered at this conference.

Student Leadership Certificate Program

The Student Leadership Certificate Program (SLP) also offered through the OHD office, provides leadership development opportunities for all currently registered undergraduate and graduate students at the University of Waterloo. The ultimate goal of the program is to increase students' leadership capacity within the classroom and the campus community, while on co-op employment and after graduation. This is achieved through a series of two-hour workshops that feature personal assessments, group activities, reflection exercises and goal setting opportunities. Principles of teamwork and collaboration, succession planning and dealing effectively with conflict are among the various topics addressed at the workshops.

Students who complete the 12 workshop sessions receive an e-certificate. Since the program's inception in 2008, more than 5,000 students participated and more than 180 students earned the e-certificate at the end of 2010.

Economic Health

The University of Waterloo is regarded as a key factor in the development and growth of the technology cluster in the Region of Waterloo. It is crucial to the region's continued prosperity, accounting for more than $1.1 billion of its economic activity*. The health of the university's own financial standing is essential in delivering quality service to students, adequately supporting staff and faculty members, and enhancing community outreach programs. To maintain the university's financial well-being today and in the future, strong fundraising efforts, effective competition for research awards and responsible asset management are important.

Key Performance Areas:

· **Fundraising**
· **Research awards**
· **Asset management**
· **Community outreach**

* According to the 2001 PriceWaterhouseCoopers Regional Economic Benefits Study.

130

Economic Health
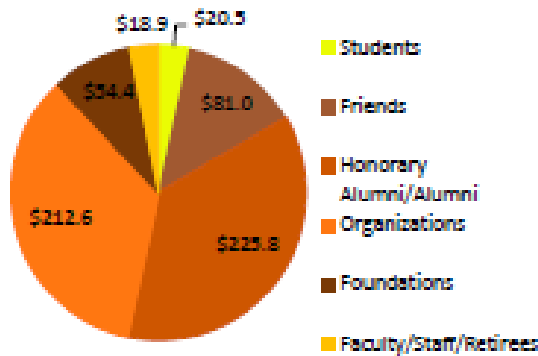
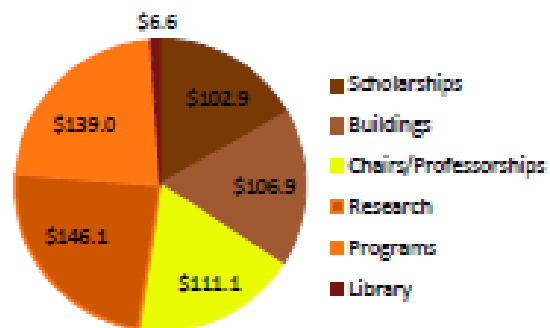| Fundraising | Research Awards | Asset Management | Community Outreach |

Campaign Waterloo: Building a Talent Trust

Launched in 2000, Campaign Waterloo: Building a Talent Trust raised $1.05 billion for the University of Waterloo as of September 2010. Of this sum, the university raised $613.2 million, while an additional $444.9 million was received from government, private and matching sources for campaign priorities (Figure 12). More than 500 new student awards were established as a result of the campaign, providing hundreds of students with scholarships and bursaries. Additionally, a total of 2.5 million square feet was added, increasing campus square footage by 48 per cent since 2000 (see Figure 13 for designations).

Figure 13: Campaign Waterloo Designations (Millions of Dollars, May 2000 to September 2010)

- Scholarships — $102.9
- Buildings — $106.9
- Chairs/Professorships — $111.1
- Research — $146.1
- Programs — $139.0
- Library — $6.6

NOTE: $0.6 million in unrestricted funding designation are not shown on the graph.

Figure 12: Campaign Waterloo Constituencies (Millions of Dollars, May 2000 to September 2010)

- Students — $20.5
- Friends — $81.0
- Honorary Alumni/Alumni — $225.8
- Organizations — $212.6
- Foundations — $54.4
- Faculty/Staff/Retirees — $18.9

Economic Health

Fundraising | Research Awards | Asset Management | Community Outreach

High research activity at the University of Waterloo helps attract graduate students and professors to join the campus community. In the 2009/10 fiscal year, $170 million was raised to support the university's research (Figure 14). Nearly 50 per cent of this funding came from the federal government (Figure 15). Tri-Council awards from the Natural Sciences and Engineering Research Council (NSERC), the Canadian Institutes for Health Research (CIHR) and the Social Sciences and Humanities Research Council (SSHRC) comprised a significant proportion of this funding.
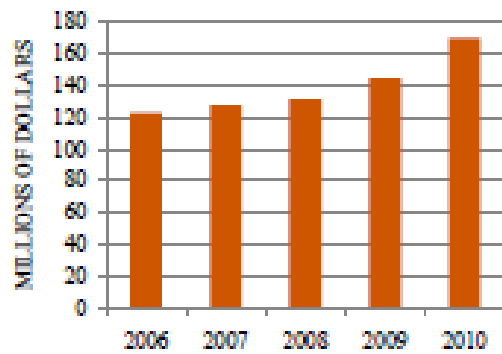
Figure 15: University of Waterloo Sponsored Research Awards by Source (2009/10)

- Federal Tri-Council — 25%
- Federal (excluding Tri-Council) — 24%
- Provincial — 23%
- Industry — 11%
- Other — 17%

Figure 14: University of Waterloo Sponsored Research Awards (by Award Year Ending)

132

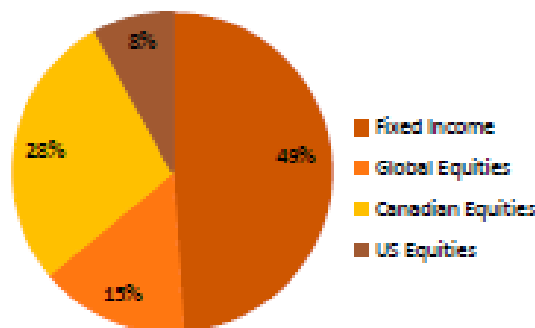# Economic Health

The University of Waterloo Finance and Investment Committee oversees the university's endowment fund management and assists the Board of Governors in the determination of the university's overall investment policies, objectives and strategies. The University of Waterloo Pension and Benefits Committee is responsible for the overall design, modification and administration of the university's pension plan, including its investment objectives, investment managers retention and performance monitoring. Overall, a conservative investment approach is preferred at the University of Waterloo to protect its assets from negative market fluctuations. This explains why fixed-income investments comprise 56 and 49 per cent of the pension and the endowment funds respectively (Figure 16 and Figure 17).

Figure 16: University of Waterloo Pension Fund Allocation (2009/10)
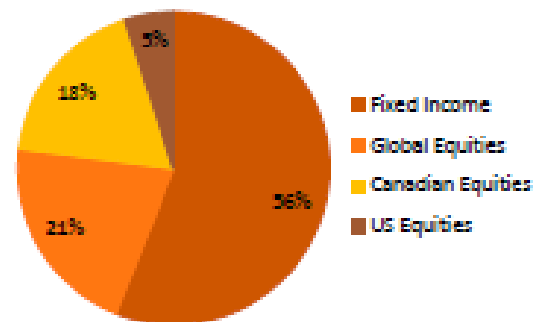
The University of Waterloo currently does not subject its investments to socially responsible investment (SRI) screening.

Figure 17: University of Waterloo Endowment Fund Allocation (2009/10)

Economic Health

Endowment Fund Management

In the 2009/10 fiscal year, the University of Waterloo endowments amounted to $226.7 million. Fundamental to the university's philosophy on endowment fund management is the general principle of maintaining the purchasing power of all endowment funds by limiting the amount made available for spending, and reinvesting any income not made available for spending in a particular year. Such an endowment fund philosophy ensures the university's financial needs are met today and in the future.

Pension Fund Management

The University of Waterloo's $1-billion defined benefit pension plan pays benefits that are indexed to inflation, and provides university staff and faculty with a defined pension income. On a yearly basis, actuarial analysis of both present and future pension commitments is performed to ensure the fund's solvency, or its ability to meet long-term liabilities. At the end of 2010, the University of Waterloo pension fund solvency ratio, or the market value of its assets to long-term liabilities, was 0.96. The university aims to achieve a solvency ratio of one, equating the ratio of market value assets to long-term liabilities by 2015.

Waterloo Commercialization Office

Effective protection and commercialization of intellectual property (IP) is essential in driving innovation, start-up creation and economic growth.

The Waterloo Commercialization Office (WatCo) works with the University of Waterloo creator-owners to provide IP protection and achieve commercialization. The revenues from commercialization efforts are split 75 per cent to the creator-owners and 25 per cent to the University of Waterloo to recover the IP protection costs. In situations where the creator-owners wish to commercialize independent of WatCo's involvement, they are free to do so without any further requirement to share commercialization revenues with the university.

An example of WatCo's success was $750,000 secured for a University of Waterloo spin-off, Tyromer, in 2009. The start-up converts scrap tires into a new, high-quality recycled polymer product.

Economic Health

Fundraising | Research Awards | Asset Management | Community Outreach

Enrichment Programs

The University of Waterloo offers a number of enrichment programs for youth, from day camps for six- and seven-year-olds to month-long residence programs for high school students. For example, to introduce more females to the opportunities available in engineering and computer science fields, the university hosts two programs for younger girls:

- CS Girls Rock for girls in grades 9-10

- Go Eng Girl for girls in grades 7-10

Other programs, summer camps and events are held regularly. For example, the World Town Planning and Kinesiology Lab Days are hosted at the university in November and December respectively every year.

Team-Up Community Outreach Program

Administered by the University of Waterloo Department of Athletics, the Team-Up Community Outreach Program brings volunteer student athletes into local communities to speak to elementary school students about the Six Keys to Success (setting goals, working hard, maintaining positive attitudes, being team players, having positive role models, and making the right choices). In 2010, 42 student-athlete speakers visited 58 different schools in Kitchener, Cambridge, Waterloo, Elmira, St. Jacobs, Breslau, New Dundee, Floradale and Maryhill, Ontario. They spoke to more than 4,600 students, sharing personal stories of accomplishment and perseverance.

Electronic Equipment Recycling Day

In 2010, University of Waterloo Central Stores partnered with Research In Motion and GreenTec Recycling Services Inc. to organize the Electronic Equipment Recycling Day. This one-day event made it possible for interested local community members to dispose of unwanted computers, printers, cartridges, cell phones, and other electronic items. Three truckloads of equipment were brought to the GreenTec processing plant for dismantling and recycling; unwanted cell phones were taken to a local women's shelter. Central Stores aims to continue hosting similar events.

Waterloo Public Interest Research Group

Founded in 1973, the Waterloo Public Interest Research Group (WPIRG) is a student-run social justice, environmental and leadership action centre at the University of Waterloo. WPIRG volunteers organize leadership skills-building workshops, work with both local and global organizations to spread awareness about social and environmental issues, and bring prominent speakers such as David Suzuki, Stephen Lewis and Ralph Nader to locally held public lectures.
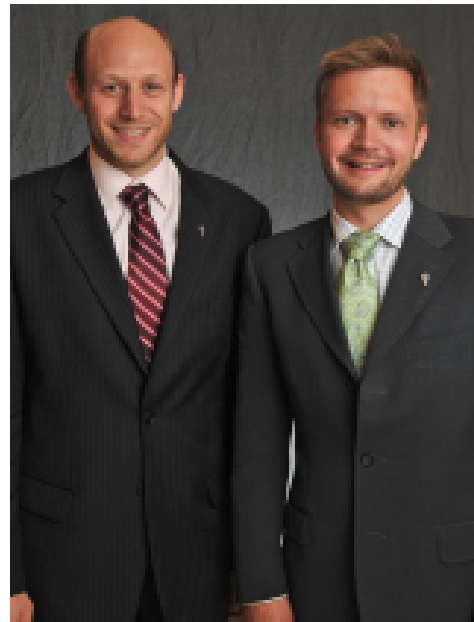
135

Economic Health

Engineers Without Borders

Two graduates of the University of Waterloo, Parker Mitchell and George Roter, founded Engineers Without Borders Canada (EWB) in 2000. Today, the organization has nearly 50,000 members working to harness the skills and creativity of the Canadian engineering sector to combat extreme poverty in Africa. At EWB's University of Waterloo chapter, students from engineering and other disciplines work together to educate the public about the challenges of poverty and available solutions. Every summer, a University of Waterloo student is sent to work for four months with community members in western and southern Africa. The university also supports long-term volunteers, who work overseas for as long as several years.

University of Waterloo Sustainability Project

The University of Waterloo Sustainability Project (UWSP) is a student-run organization involved in advocating for, and implementing, sustainability initiatives on campus and in the local community. UWSP projects include waste management, natural landscaping, sustainable transportation, and climate change education and awareness campaigning, as well as organization of events such as Earth Hour and Buy Nothing Day.

George Roter (left) and Parker Mitchell, co-founders of Engineers Without Borders

136

Academic Excellence

From the earliest days, when community leaders in southern Ontario created a university that would combine experience with classroom learning, Waterloo has answered the educational demands of the nation.

Just 54 years after its first engineering classes were offered in a tin-roofed portable, Waterloo has grown to become known as Canada's most innovative university and Canada's best overall university, according to the *Maclean's* national reputation survey.

Waterloo's incoming first-year students have the highest average grades of students at any comprehensive university in the country. And it's widely known for the excellence of its academic offerings across a range of disciplines.

For example, the Faculty of Arts clinical psychology program ranks number two in North America. The Centre for Environment and Business has ranked first among institutions across Canada for the last three years in *Corporate Knights'* ranking of business programs, and is recognized as a model of how business and the environment can be integrated into the curriculum.

The university is home to the world's largest post-secondary co-operative education program, the world's first and largest faculty of mathematics, globally renowned computer science and engineering programs, and unique research institutes and faculty-based schools.

Meaningful experience inside and outside the classroom drives exemplary teaching, research, and collaboration at the University of Waterloo.

Key Performance Areas:

- Co-operative education
- Research institutes
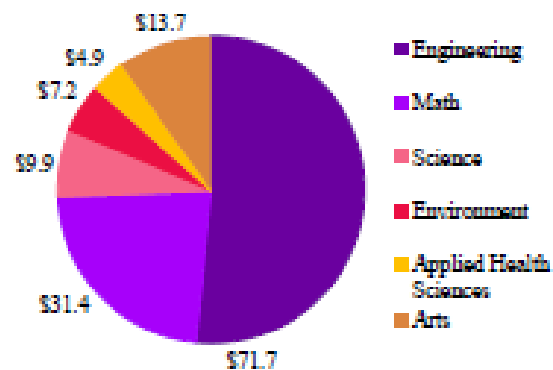- Faculty-based schools
- Student engagement

Academic Excellence

Co-operative Education	Research Institutes	Faculty-Based Schools	Student Engagement

The University of Waterloo's co-operative education program was founded in 1957, the same year that the university opened. It became the first program of its kind in Canada and now assists nearly 16,000 students annually in finding co-op employment. Alternating four- to eight-month work and academic terms provides University of Waterloo co-op students with opportunities to earn income while gaining up to two years of real-life work experience.

On average, by the time University of Waterloo co-op students graduate, they have earned between $25,000 and $74,000. In the 2009/10 fiscal year, total earnings of co-op students amounted to $139 million (Figure 18). Top employment locations for co-op students were Toronto (26 per cent) and Kitchener-Waterloo (19 per cent), followed by other provincial, national and international destinations.

The Co-operative Education & Career Services department currently manages 28,000 active employer contacts and maintains an overall co-op employment rate close to 97 per cent.

Figure 18: University of Waterloo Co-op Student Earnings by Faculty (Millions of Dollars, 2009/10)

- Engineering — $71.7
- Math — $31.4
- Science — $9.9
- Environment — $7.2
- Applied Health Sciences — $4.9
- Arts — $13.7

138

Academic Excellence

| Co-operative Education | Research Institutes | Faculty-Based Schools | Student Engagement |

In 2010, the University of Waterloo was ranked Canada's No. 1 comprehensive research university for the third year in a row in the annual "Canada's Top 50 Research Universities" survey by Research Infosource, a national consulting firm. Profiled below are some of the university's interdisciplinary research centres and institutes that create a unique environment of innovation and collaboration at the University of Waterloo's main campus.

The Waterloo Institute for Sustainable Energy

Established in 2008, the Waterloo Institute for Sustainable Energy (WISE) includes more than 80 researchers from the faculties of engineering, environment, science, and mathematics working on energy systems and policies design. The institute promotes environmental sustainability and aims to foster the development of innovative technologies and alternatives to existing energy production and delivery systems. Research areas include renewable energy; battery technologies and energy storage; power systems infrastructure; emissions management; energy efficiency; and demand management.

The Water Institute

Created in 2009, the University of Waterloo Water Institute focuses on aquatic ecology and ecotoxicology; groundwater science and engineering; hydrological and atmospheric sciences; water treatment and technology; and water policy, management and governance research. More than 100 faculty members from all of the university's six faculties and close to 20 departments are engaged in these key areas.

Interdisciplinary Centre on Climate Change

Based in the Faculty of Environment, the Interdisciplinary Centre on Climate Change (IC3) brings together researchers from the University of Waterloo faculties of engineering, science, and mathematics, as well as from Environment Canada, to tackle issues pertaining to climate change. The institute's five core themes of research are atmospheric science; cryospheric science; human dimensions of climate change; observing systems and modeling; and water, ecosystems, and biogeochemical cycling.

Academic Excellence

The Conrad Centre for Business, Entrepreneurship and Technology

CBET

Located in Waterloo's Research and Technology Park, the Conrad Centre for Business, Entrepreneurship and Technology (CBET) promotes a collaborative, risk-taking environment that transforms emerging concepts into commercial success. CBET offers the Master of Business, Entrepreneurship and Technology (MBET), a specialized business degree that focuses on the commercialization of ideas and discovering new market opportunities. More than 30 successful start-ups have been launched by the MBET graduates in the last five years.

The Institute for Innovation Research (IIR), housed within CBET, provides a focal point for multidisciplinary research on innovation. Researchers from across campus contribute to IIR to develop the next generation of faculty who will provide insight into the management and policy challenges of innovation and commercialization.

A signature University of Waterloo program, Enterprise Co-op is an entrepreneurial-focused co-operative education option for enterprising undergraduate students looking to build their own business.

Mike and Ophelia Lazaridis Quantum-Nano Centre (QNC)

Scheduled to open in 2011, the Mike and Ophelia Lazaridis Quantum-Nano Centre (QNC) will become the first research facility of its kind in the world. Up to 400 academics from the Institute for Quantum Computing (IQC) and the Waterloo Institute for Nanotechnology (WIN), as well as University of Waterloo undergraduate nanotechnology engineering students, will come together under one roof.
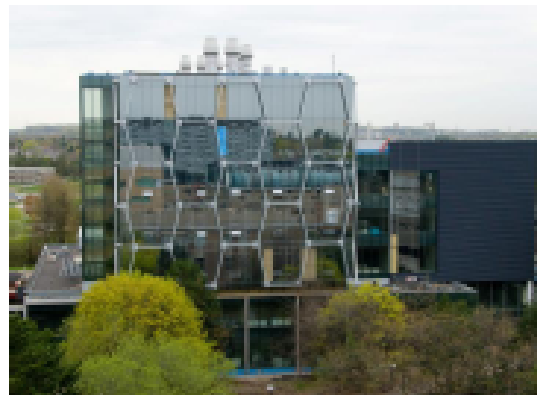
Views of Mike and Ophelia Lazaridis Quantum-Nano Centre, University of Waterloo Main Campus

Academic Excellence

| Co-operative Education | Research Institutes | Faculty-Based Schools | Student Engagement |

The University of Waterloo offers a wide range of sustainability-related degree programs. For example, students can specialize in environmental engineering, earth sciences, science and business, environment and resource studies, and environment and business, as well as geography and environmental management programs. Notably, the University of Waterloo Faculty of Environment is the oldest faculty of its kind in Canada, and the School of Architecture, the School of Planning and the School of Environment, Enterprise and Development have all been rated as top schools in Canada for incorporating environment into their curriculum. Examples below illustrate the impact that some schools have on the well-being of local communities and the advancement of the broader sustainability movement.

School of Pharmacy

Canada's only co-op school of pharmacy opened in 2008 at the University of Waterloo Health Sciences Campus in downtown Kitchener. The school takes advantage of inter-professional learning through collaboration with McMaster University's Michael G. DeGroote School of Medicine, the University of Waterloo's School of Optometry satellite team, and a full-service family clinic, all located at the Health Sciences Campus. Community service learning is incorporated into the school's curriculum, with all first-year students assigned to teams to work with local social service agencies.

The School of Pharmacy hosts a series of free public talks and offers the local community a more in-depth six-week paid lecture program on health and wellness.

The University of Waterloo School of Pharmacy, Health Sciences Campus, Kitchener, Ontario

Academic Excellence

Co-operative Education | Research Institutes | Faculty-Based Schools | Student Engagement

School of Environment, Enterprise and Development

The School of Environment, Enterprise and Development (SEED) launched in 2009. It brings together the unique undergraduate programs of environment and business, which has been ranked No. 1 in the country by *Corporate Knights* magazine*, and international development. At the graduate level, the school offers a Master of Environment and Business degree, a Master of Development Practice degree, a Master of Local Economic Development degree, and a Graduate Diploma in Social Innovation. Furthermore, SEED houses two unique professional development programs. The sustainability practice program provides sustainable development training to the capital markets, industry, government, NGO community, and other stakeholder groups. The economic development program provides certificate, diploma and fellowship programs through partnership with Economic Developers Association of Canada. SEED is also home to the Social Innovation Generation (SIG) group, a national collaboration addressing Canada's social and ecological challenges by creating a culture of continuous social innovation.

* Corporate Knights is a Canadian-based publication that positions itself as the "world's largest circulation magazine with an explicit focus on corporate responsibility."

The Balsillie School of International Affairs

Founded in 2007 by Jim Balsillie, co-CEO of Research In Motion, the Balsillie School of International Affairs is a collaborative partnership among Wilfrid Laurier University, the University of Waterloo, and the Centre for International Governance Innovation (CIGI), a public policy think-tank that addresses international governance challenges. More than 60 affiliated faculty members teach and supervise students in the PhD in Global Governance, the Master of Arts in Global Governance, and the Master's in International Public Policy programs. The school runs and supports several seminar series, including the International Governance Speakers Series, the International Human Rights Speakers Series, the Informal Seminar for doctoral students, and the CIGI Junior Fellowship Series, a professional development seminar for masters-level students. The inaugural Multidisciplinary Graduate Student Conference on Global Governance will take place in Waterloo in October 2011.

School of Optometry

The University of Waterloo School of Optometry provides the only English optometric training in Canada and accommodates the second-largest centre for contact lens research in the world. The school delivers an accredited four-year degree program leading to a professional Doctor of Optometry (OD). Its clinics serve more than 24,000 patients annually and a unique community outreach program provides mobile care to Mennonite communities, nursing homes, and other groups with patients who have difficulties commuting.

Academic Excellence

| Co-operative Education | Research Institutes | Faculty-Based Schools | Student Engagement |

National Survey of Student Engagement

The University of Waterloo participates in the National Survey of Student Engagement (NSSE). The survey evaluates the degree to which students are engaged in their education and university life in general. *Maclean's* magazine uses the NSSE results to help high school graduates in selecting which university to attend. According to the *Maclean's 2010 Guide to Canadian Universities*, the University of Waterloo ranked bottom ten out of the 56 respondents in the following areas:

· **Level of Academic Challenge**: number of assigned readings and written reports, as well as coursework emphasizing judgment

· **Student-Faculty Interaction**: how often students meet with faculty or work with them in research projects or other activities outside of class

· **Supportive Campus Environment**: extent to which the university supports academic and non-academic endeavours and cultivates positive relationships among students, faculty and staff

· **Active and Collaborative Learning**: how often students work with classmates, make classroom presentations, or participate in community projects

There may be a link between student engagement and the slight decline in the first-year student retention rates* at the University of Waterloo (Figure 19).

Figure 19: University of Waterloo Annual First-Year Student Retention Rates
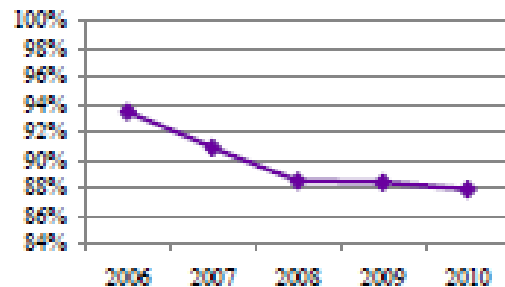
* *First-year student retention rates are measured as the percentage of first-year students who return to the university in second year. Data adapted from Maclean's 2006, 2007, 2008, 2009 and 2010 Guides to Canadian Universities.*

To enhance student experience at the University of Waterloo, and address student engagement and retention issues, a Student Success Office was launched in 2010. The English Language Proficiency Program, Student Life Office, International Student Office and VeloCity are all now part of this office. In addition, new learning support, student technology, and student development units are being developed to help students adapt to campus life. Over the 2011/12 school year, the Student Success Office will be established on the second floor of South Campus Hall.

Academic Excellence

| Co-operative Education | Research Institutes | Faculty-Based Schools | Student Engagement |

Living-Learning Communities

A Living-Learning Community is a small group or "cluster" of eight to 16 first-year students who are enrolled in the same academic program and who share classes, living space and friendships. These clusters of students are placed within larger residence communities of 40 to 60 students. Such an arrangement gives students the opportunity to live near classmates and to meet people from other academic programs. Upper-year students called "Peer Leaders" are also involved in the program and help facilitate academic events and study skills sessions.

VeloCity Residence

Launched in 2008, the University of Waterloo VeloCity residence accepts 70 students on a term-by-term basis to live in a digital media "dormcubator." Throughout the term students are exposed to speakers, mentors, resources and a community of like-minded and driven entrepreneurs. A number of successful start-ups have initiated out of VeloCity, including Kik Interactive, Inc., the creator of a free real-time communication application between mobile device users.

VeloCity Residence Great Hall, University of Waterloo Main Campus

VeloCity Residence Conference Room, University of Waterloo Main Campus

144

Future Directions

This report provides an initial assessment of the University of Waterloo's sustainable development performance on the main campus.

Devising a concrete sustainable development plan with measurable objectives is the next step in fulfilling the Council of Ontario Universities *Ontario Universities: Committed to a Greener World* pledge.

As reflected in this report, the University of Waterloo has achieved substantial success across multiple areas of sustainable development performance on the main campus. Reductions in energy and water consumption, increased research activity and a growing co-operative education program are among such examples.

To ensure continuous improvement of the university's sustainable development practices and performance, the following actions are recommended:

· Implementing individual building energy and water metering

· Undertaking a new waste audit

· Devising a strategy to reduce CO_2 emissions

· Developing strategies to lower employee injury frequency and injury severity rates

· Implementing programs to officially recognize student non-academic involvement and boost student engagement

Accordingly, the University of Waterloo should develop a framework to bring together operational experts and other stakeholders to determine sustainable development plan and performance objectives. The frequency at which subsequent sustainable development reports will be produced should also be established.

Please note that any inquiries pertaining to this report can be addressed to:

Betty Bax
Development and Communications Officer
Faculty of Environment
Phone: 519-888-4567 x38100
Email: bax@uwaterloo.ca

Appendix

The University of Waterloo main campus annual data.

	2005/06	2006/07	2007/08	2008/09	2009/10
Electricity Consumption (1000's GJ)	290	319	320	311	337
Gas Consumption (1000's GJ)	448	439	450	489	499
Total Annual Energy Consumption (1000's GJ)	738	758	770	800	836
Building Space Heated and Cooled (m^2)	522,243	528,716	535,765	564,818	611,029
GJ/m^2	1.41	1.43	1.44	1.42	1.37
Water Consumption (1000's m^3)	792	808	621	673	514
Landfilled Waste (tonnes)	1,962	2,088	1,822	2,052	2,442
Blue Bin Recycled Waste (tonnes)	174	165	149	82	N/A
Recycled Cardboard (tonnes)	148	194	203	352	355
CO_2 Emissions from Natural Gas (tonnes)	22,337	21,871	22,453	24,351	24,852
CO_2 Emissions from Electricity (tonnes)	12,880	14,194	14,234	13,817	14,995
CO_2 Emissions from Landfilled Waste (tonnes)	4,071	4,334	3,782	4,258	5,068

	2006	2007	2008	2009	2010
Health Services Physician Booked Visits	26,879	24,205	27,123	29,883	32,724
Health Services Nurse Visits	15,374	16,208	17,190	19,507	17,819
Other Health Services Visits	7,388	7,279	7,507	6,840	7,559
Total Visits to Health Services	49,641	47,692	51,820	56,230	58,102
Employee Injury Frequency Rates	1.7	2.1	1.8	1.6	1.7
WSIB Rate Group 817 Injury Frequency Rates	1.3	1.3	1.4	1.2	1.1
Employee Injury Severity Rates	50	52	50	58	92
WSIB Rate Group 817 Injury Severity Rates	25	28	30	34	32

	2006	2007	2008	2009	2010
Sponsored Research Awards (Millions of $)	123	128	131	144	170

	2006	2007	2008	2009	2010
First-Year Student Retention Rates	94%	91%	89%	88%	88%

146

About the Author

Natalia Moudrak holds a Bachelor of Arts in Honours Economics and is a candidate for a Master of Arts degree in Planning from the University of Waterloo.