

Brock University

Carbon Project Annual Report

2012



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Introduction

In a changing world, institutions and organizations in various sectors, including higher education, have directed their attention towards adopting more sustainable practices in their operations. It is becoming common practice for higher education institutions to find applicable sustainable opportunities and develop strategies to regulate and reduce their actions.

As higher education institutions integrate sustainability into their programs and departments, they provide valuable and meaningful education that prepares their students into the changing workforce. Institutions are providing their students with the appropriate platform required to effectively incorporate a new generation of sustainable perspectives into the existing framework.

In partnership with Niagara Sustainability Initiative (NSI), Brock University has undertaken the process of investigating its corporate carbon footprint to be disclosed publically. A carbon footprint provides a organization with information on their environmental impact through the conversion of multiple impacts to a single measure called carbon dioxide equivalents. The purpose of this report is to update and inform Brock University of their activities to date under the Carbon Project.

This is a particularly unique year for Brock as 2012 is being used as the Baseline Year for the University. Establishing a baseline year provides an opportunity for Brock to measure the current organizational carbon footprint to then manage and mitigate carbon to achieve a target reduction of 20% over the next 10 years.

Voluntary Reporting: The Carbon Project

The Carbon Project is a voluntary program whereby partners commit to managing and reducing their organizational carbon emissions. The Carbon Project was designed by experts to maximize environmental responsibility and business returns for NSI partners.

The **Carbon Project** provides NSI partner organizations with services, tools and networks to facilitate a reduction in carbon (or GHG) emissions. In turn, participating organizations report their corporate carbon footprint, at a minimum, on an annual basis.

There are many benefits to reporting an organization's carbon footprint. The **Carbon Project** provides NSI partner organizations with services, tools and networks to facilitate a reduction in carbon (or GHG) emissions. In turn, participating organizations report their corporate carbon footprint, at a minimum, on an annual basis. These accomplishments are published in NSI's Annual Sustainability Report, which highlights and celebrates changes each of their Carbon Project partners have made resulting in annual emissions reductions.



Scope of Inventory

This report describes the corporate carbon footprint of Brock University covering the time period from January 1 to December 31, 2012. International GHG accounting standards were followed to determine Brock University's carbon footprint through the use of carbon accounting software developed by e3 Solutions. According to these standards, emissions generating activities were classified under the following scopes:

Scope 1: All GHG emissions resulting from direct combustion.

Scope 2: Indirect GHG emissions from consumption of purchased electricity.

Scope 3: Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, outsourced activities, waste disposal, water usage and others.

As a participating organization in the Carbon Project, Brock U has committed to measuring and reporting emissions from the following activities:

Scope 1: Vehicle Fleet, Stationary Combustion

Scope 2: Electricity consumption

Scope 3: Business travel

Note: *Business Travel for the months of January to March are included only for purpose of interest on behalf of the University to determine the contribution level of this scope 3 activity. Business Travel moving forward will not be included unless otherwise indicated by Brock.



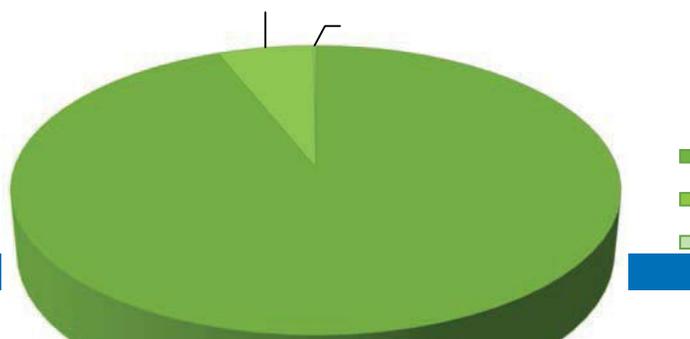
Inventory

The corporate carbon inventory totalled 25,580.10 tonnes of CO₂e (tCO₂e) and was predominantly comprised of scope 1 emissions, with Stationary Combustion (23,938.04 tCO₂e) and vehicle fleet (92.48 tCO₂e) representing the largest emissions sources. Scope 2 represented the second largest contributor to corporate carbon emissions at 1,519.70 tCO₂e for electricity consumption. Lastly, scope 3 business travel accounted for 29.88 tCO₂e.

Table 1. Corporate carbon footprint by scope.

| Scope 1 | | Scope 2 | | Scope 3 | | All Scopes |
|--|------------------|--|-----------------|---|--------------|------------------|
| Fleet Vehicles (tCO ₂ e) | 92.48 | Electricity Consumption (tCO ₂ e) | 1,519.70 | Employee Commuting (tCO ₂ e) | -- | |
| Stationary Combustion (tCO ₂ e) | 23,938.04 | | | Business Travel (tCO ₂ e) | 29.88 | |
| | | | | Waste (tCO ₂ e) | | |
| | | | | | -- | |
| Refrigerants (tCO ₂ e) | -- | | | Water (tCO ₂ e) | -- | |
| Total (tCO₂e) | 24,030.52 | Total (tCO₂e) | 1,519.70 | Total (tCO₂e) | 29.88 | 25,580.10 |

Corporate Inventory by Scope (tCO₂e)



Scope 2: 5.94%

Scope 3: 0.12%

Scope 1: 24,030.52 tCO₂e

Scope 2: 1,519.70 tCO₂e

Scope 3: 29.88 tCO₂e

Scope 1: 93.94%

Figure 1. Illustrating corporate carbon footprint by scope in tCO₂e, including percentage by scope.



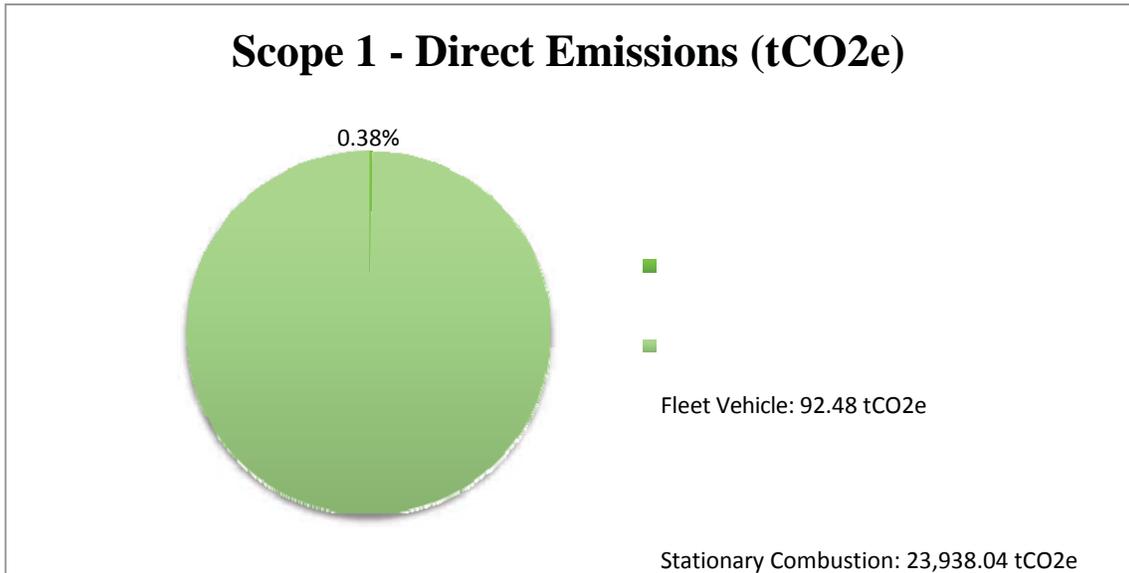


Figure 2. Illustrating the breakdown of Scope 1 emissions.

Moving Forward

Measure, manage and mitigate make up the central tenets of carbon management. Following these guidelines, the NSI Carbon Team has highlighted potential paths forward for Brock University with respect to their carbon footprint.



Measure

Measuring the organizational carbon footprint is the key to determine accurate and quality data to report on. Within the voluntary reporting stationary combustion, electricity consumption, and vehicle fleet are mandatory to report. As a means to improve on the quality and accuracy of the data collection, the following recommendations are provided to allow for a more comprehensive inventory of Brock University's carbon footprint. These recommendations are given with keeping in mind the ultimate goal of reducing GHG emissions by 20% over the next 10 years.

- **Scope Enhancement:** Including additional Scope 3 emissions such as employee commuting, business travel, waste and water. It would also help to incorporate facilities which are not owned or operated by Brock but are occupied by Brock staff.
- **Improve data collection:** there is an opportunity to better manage and collect utility information for better representation of Brock's entire consumption. This applies specifically to challenges around electricity and natural gas data collection for residences.
- **Improved Metering:** Having individual meters assigned at each facility powered by Co-Gen plant would help determine how much energy each facility consumes instead of a number for total electricity consumption for multiple locations.
- **Frequency of data compilation:** Submitting utility data on a quarterly basis not only helps



management by Brock to keep data in order but also helps the carbon accounting team input this information into the software.

- **Ontario Regulation 397/11.** To assist in properly reporting the corporate carbon footprint for Ministry requirements, Brock should also ensure consistency in reporting using NSI's Carbon Accounting Tool.

Manage

Following measurement and quantification, the next step is carbon management of GHG emissions. This piece requires analyzing the carbon footprint and identifying significant reduction opportunities that exist within the organization. The following management recommendations are broken down into their respective scopes, as well as into behavioural and structural changes.

Scope 1 Reductions:

- **Facilities Management:** Stationary combustion in terms of heating is the greatest contributor of GHG emissions for Brock. Individual thermostats and tracking of heating bills more regularly (monthly basis) will help regulate natural gas use. Additionally, this will allow for identification of fluctuations in billing between different facilities and buildings.
- **Fleet Vehicles:** Although vehicle fleets are necessary for the facilities management, the type of vehicle used can make a significant difference in fuel emissions. Exploring alternative options such as a hybrid, diesel, or biodiesel vehicle with it comes time to upgrade vehicle fleet is recommended. Additionally, practices surrounding route optimization, idling times, and reduced driving days should be investigated and implemented

Scope 2 Reductions:

- **Green retrofits:** Brock has already implemented a number of building retrofits such as lighting conversions and improvements in the central heating/chilling plant. However, energy conservation initiatives such as behavioural changes of users or automated lighting, heating and cooling are key and should be undertaken to increase efficiency.
- **Installation of Utility Sub-Meters:** As a long term goal, the implementation of individual meters at each facility would be beneficial in the management of electricity consumption and any future electricity reduction initiatives.

Mitigate



The final pillar of carbon management involves mitigating the emissions that cannot be managed and reduced. Based on the data collected for year 2012, Brock largest contributor of total carbon is Scope 1, stationary combustion. Hence, largest reduction opportunities will be achieved by focusing on this direct emission.

- **Staff and student education and engagement.** An engaged staff and student community that is aware and educated about sustainability-related goals and Brock's objective of reducing total GHG emissions by 20% can have a considerable effect on carbon reductions. It is recommended that Brock should regularly communicate and promote current and future sustainability projects to both the student body and its faculty and staff. Additionally, educational programs for staff



will assist in employee engagement. Attendance and participation in community events including NSI's events and workshops should be encouraged as it will strengthen support as the university works towards their target reductions.

Additional Opportunities

A green procurement policy can showcase a commitment to environmental responsibility and has the potential to enhance the organization's environmental reach by asking its contractors and supply chain to measure, manage and mitigate their carbon footprint. Through a green procurement policy, Brock University has the opportunity to influence numerous stakeholders in the region, allowing for alignment with the Regional Municipality of Niagara's carbon reduction objectives.

Summary

Over the past year, Brock has made steady efforts to mitigate their GHG emissions. Highlight projects include: the conversions of 5,800 fluorescent T12 light fixtures to energy efficient T8s, change in control of absorption chiller resulting in a small natural gas saving, and the implementation of Green Housekeeping program. Although there are no current numbers in terms of reductions for the lighting conversions, the trends on Brock's electricity bills have decreased. Brock estimates that the conversions will save over \$100,000 annually.

Within this report several opportunities for improving the measurement, management, and mitigation of carbon emissions have been highlighted. The NSI team is always available to discuss carbon reduction strategies and looks forward to discussing the options available to Brock University.



