



Niagara College

Carbon Project Annual Report

Years 2009/2010, 2010/2011 and 2011/2012



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Introduction

In partnership with Niagara Sustainability Initiative (NSI), Niagara College has undertaken the process of investigating its corporate carbon footprint. The purpose of this report is to update and inform Niagara College regarding activities to date under the Carbon Project.

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.

Scope of Inventory

This report describes the corporate carbon footprint of Niagara College covering the time period from April 1, 2009 to March 31, 2012. Niagara College has decided to track their corporate carbon inventory according to the institutions fiscal year running April 1 to March 31. Year beginning April 1, 2009 and ending March 31, 2010 was chosen as the baseline year. International GHG accounting standards were followed to determine Niagara College's carbon footprint. 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, Niagara College has committed to measuring and reporting emissions from the following activities:

Scope 1: Fleet vehicles and stationary combustion

Scope 2: Electricity consumption

Scope 3: Business travel, waste and water



Inventory

For Niagara College's baseline year, fiscal year 2009/2010, the corporate carbon inventory totalled 4,797.84 tonnes of CO₂e (tCO₂e). In 2010/2011 the corporate carbon inventory rose to 5,782.68 tCO₂e and in 2011/2012 the inventory dropped to 5,155.05 tCO₂e. In all three years, emissions were comprised largely of scope 1 emissions with stationary combustion consistently being the largest emissions contributor. Scope 2 electricity consumption has represented the second largest emissions source across the three years and has seen a steady increase year after year. Lastly, scope 3 emissions have not contributed significantly to Niagara College's corporate carbon inventory from April 2009 to March 2012.

Table 1. Corporate carbon footprint by scope, April 1, 2009 to March 31, 2010.

April 1, 2009 – March 31, 2010						
Scope 1		Scope 2		Scope 3		12 Month Total
Fleet Vehicles (tCO ₂ e)	40.21	Electricity Consumption (tCO ₂ e)	1,591.12	Business Travel (tCO ₂ e)	133.91	
Stationary Combustion (tCO ₂ e)	2,645.41			Waste (tCO ₂ e)	380.73	
				Water (tCO ₂ e)	6.46	
Total (tCO₂e)	2,685.62	Total (tCO₂e)	1,591.12	Total (tCO₂e)	521.10	4,797.84 tCO₂e

Table 2. Corporate carbon footprint by scope, April 1, 2010 to March 31, 2011.

April 1, 2010 – March 31, 2011						
Scope 1		Scope 2		Scope 3		12 Month Total
Fleet Vehicles (tCO ₂ e)	41.69	Electricity Consumption (tCO ₂ e)	1,772.99	Business Travel (tCO ₂ e)	127.92	
Stationary Combustion (tCO ₂ e)	3,435.07			Waste (tCO ₂ e)	398.49	
				Water (tCO ₂ e)	6.52	
Total (tCO₂e)	3,476.76	Total (tCO₂e)	1,772.99	Total (tCO₂e)	532.93	5,782.68 tCO₂e

Table 3. Corporate carbon footprint by scope, April 1, 2011 to March 31, 2012.

April 1, 2011 – March 31, 2012						
Scope 1		Scope 2		Scope 3		12 Month Total
Fleet Vehicles (tCO ₂ e)	22.43	Electricity Consumption (tCO ₂ e)	1,897.28	Business Travel (tCO ₂ e)	117.38	
Stationary Combustion (tCO ₂ e)	2,901.61			Waste (tCO ₂ e)	210.38	
				Water (tCO ₂ e)	5.97	
Total (tCO₂e)	2,924.04	Total (tCO₂e)	1,897.28	Total (tCO₂e)	333.73	5,155.05 tCO₂e



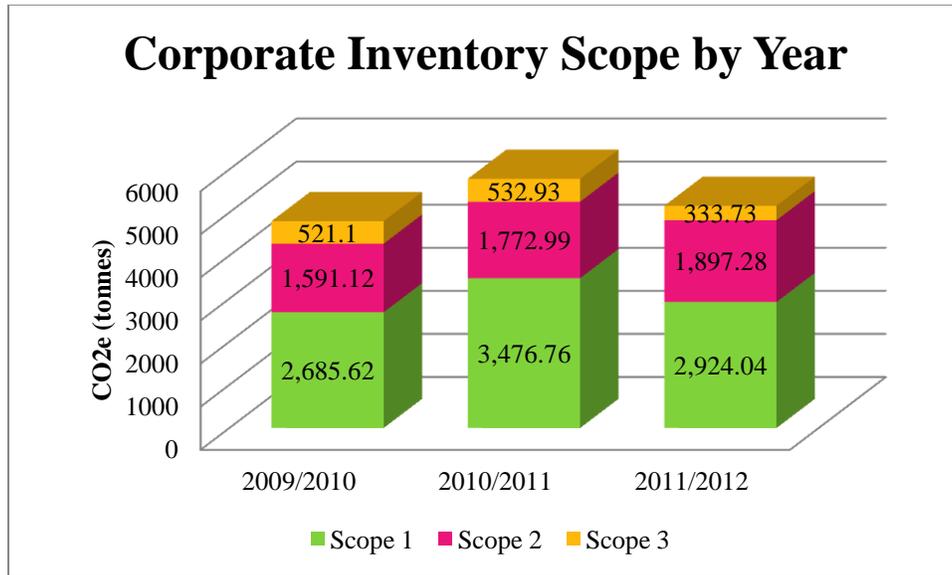


Figure 1. Illustrating corporate carbon footprint by scope in tCO₂e for 2009/2010, 2010/2011 and 2011/2012.

Data interpretation and comparison across all three study years can be misleading without further analysis. The variation in weather can be cited as a contributing factor in the increased amount of carbon emissions from stationary combustion; this is especially the case for 2010/2011. A heating degree day (HDD) is a measurement designed to reflect the demand for energy needed to heat a building. An increase in the total amount of HDD in 2010/2011 was likely a contributing factor (see Table 4).

Of course, it should be noted that the Welland campus was under construction during 2010/2011, as well. The additional space at this campus required more energy, specifically energy required for space heating, contributing to a higher overall carbon footprint.

Table 4. Depicting the number of heating degree days (HDD) for the fiscal years of 2009/2010, 2010/2011, 2011/2012.

	2009/2010	2010/2011	2011/2012
HDD	3,805	3,942	3,863

*Heating degree day data extracted from *degreedays.net* and Environment Canada.



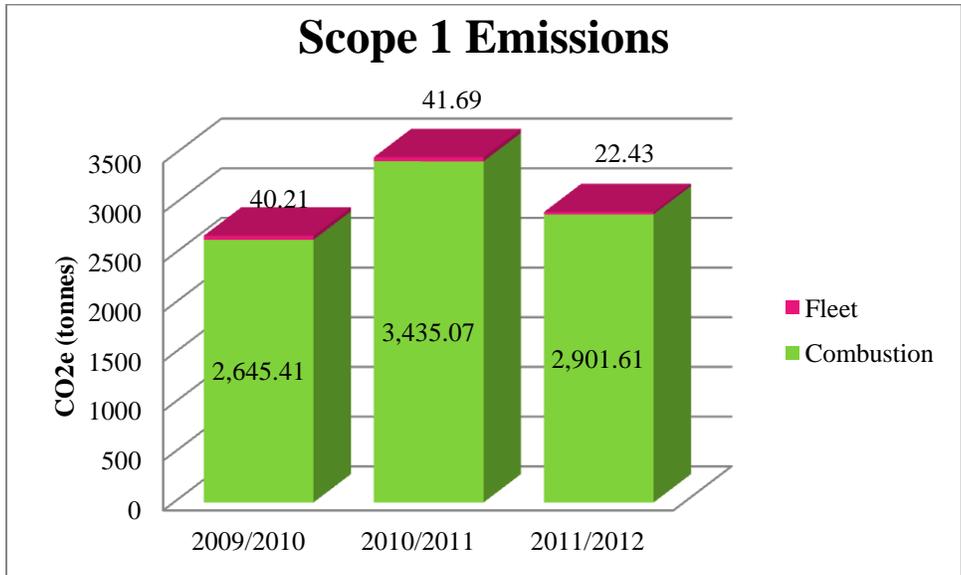


Figure 2. Depicting the breakdown of scope 1 emissions in tCO₂e for 2009/2010, 2010/2011 and 2011/2012.

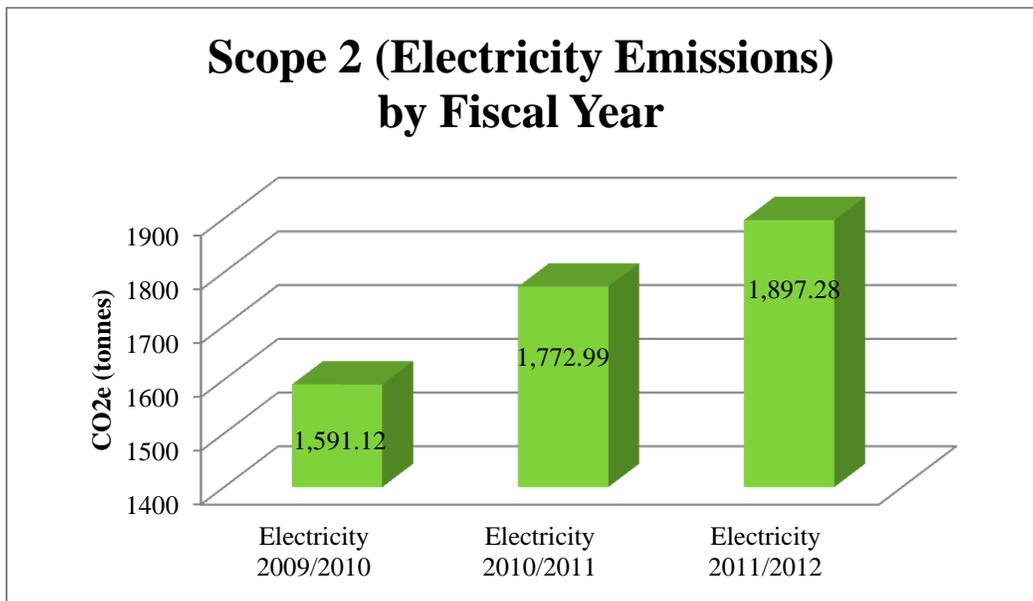


Figure 3. Illustrating electricity emissions in tCO₂e for 2009/2010, 2010/2011 and 2011/2012.

Continued expansion of Niagara College facilities can be attributed as the likely cause of increased emissions from electricity consumption.

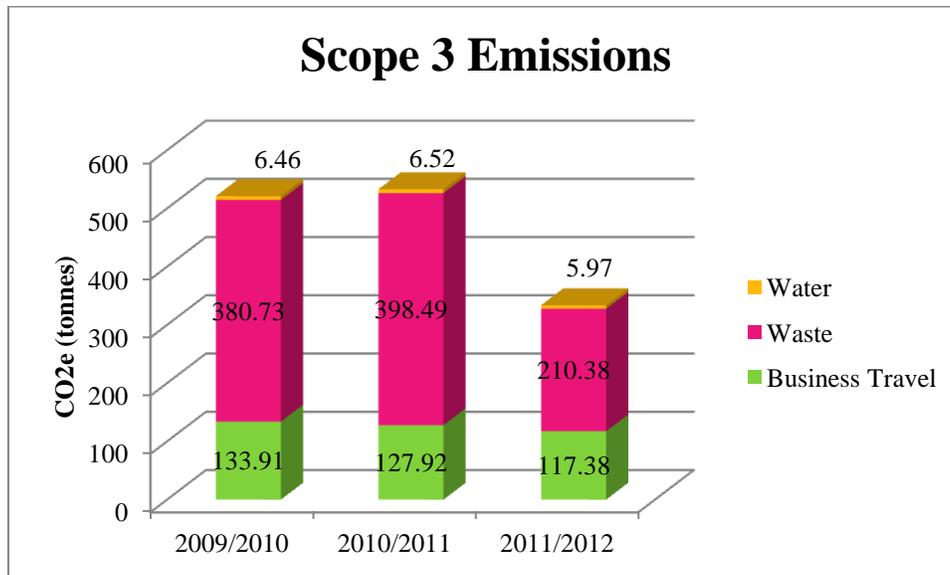


Figure 4. Depicting the breakdown of scope 3 emissions in tCO₂e for 2009/2010, 2010/2011 and 2011/2012.

A significant reduction in scope 3 emissions can be attributed to the extensive waste reduction and diversion efforts made by Niagara College during the last fiscal year.

Moving Forward

Measure, manage and mitigate are the central tenets of carbon management. Following these tenets, the NSI Carbon Team has highlighted potential paths forward for Niagara College.

Measure

Niagara College has collected three years of data starting with the baseline year (2009/2010). Quality assurance is an integral part of GHG accounting. Continual improvement to the data set will enhance the quality of the reported carbon emissions as well as improve transparency. Some of the data improvements include:

1. **Improved business travel data:** All road travel data has been quantified using the unknown vehicle category which utilizes the mid-size car emission factor group. This was used since employee vehicle types were not known to more accurately quantify business travel according to car class. Business travel quantification could be improved by improving employee business travel reporting. To accomplish this, Niagara College expense reports could be adapted to include vehicle class upon submission for reimbursement. Lastly, an in-depth investigation of inter-campus travel data would isolate the impact from this activity as well as provide potential reduction opportunities.
2. **Scope enhancement.** The carbon inventory could be broadened to include refrigerants.
3. **Ontario Regulation 397/11.** In order to report Niagara College's corporate carbon footprint to the Ministry of Energy by July 1, 2013, the alignment of current data sets with provincial requirements can be reviewed with staff over the coming months.

Manage

In order to streamline data collection and entry, some modifications could be made to the current process. Currently, emissions activity data is housed in various departments. For example, utility data invoices are stored with Facilities Management Services, whereas business travel data is stored with the Finance department and a significant portion of flight travel data is stored with the International department. A central collection point of this data, such as the Sustainability Coordinator personnel has contributed to smoothing out the process; however, additional improvements in data storage may prove to save additional time and increase accuracy.

To further data entry efficiency, a data entry schedule could be implemented. This schedule could be monthly or quarterly and would reduce the amount of data handled at one time to a more manageable quantity. For example, in the case of business travel (housed with Finance), a dedicated staff member responsible for data consolidation could request quarterly reports from the Finance department.

Mitigate

Niagara College has implemented many initiatives to reduce their corporate carbon footprint including the energy conservation projects, installation of a geothermal heat pump and green roofs. Further initiatives can be undertaken to help reduce carbon emissions including:

1. **Online meetings.** Aside from carbon reductions, online meetings present other opportunities by way of reduced time in travel and fuel expenses. Niagara College is fortunate to have state-of-the-art online meeting capabilities and could utilize these resources to assist with reducing emissions from travel. This can also assist with minimizing inter-campus travel by employees for internal meetings helping to reduce emissions and costs, as well as increase productivity.
2. **Staff and student engagement.** Niagara College is an institute with a large staff and student community. An engaged staff and student community that is aware and educated about sustainability-related goals of Niagara College can have a considerable effect on carbon reductions. It is recommended that Niagara College broaden their sustainability program to include college community engagement activities such as monthly contests.
3. **Educational programs for staff.** Educational programs for staff will assist in employee engagement. Teaching staff members about energy conservation, water & waste reduction, as well as other sustainability-related activities will help further engagement, education and awareness. This can be achieved by providing information to staff on campus educating them about Niagara College's sustainability goals and how they can contribute. Monthly sustainability lectures can also be provided to assist with employee understanding of certain sustainability topics.
4. **Facility retrofits.** While building retrofits are specific to each facility, it is important to note that a retrofit should be one of the last steps involved in building energy management. A first step in reduction efforts should be eliminating waste. Energy conservation initiatives such as behavioural changes of users or automated lighting, heating and cooling should be undertaken first to ensure operations are efficient prior to investing in retrofits.

Further Opportunities

Green Procurement

A green procurement policy publically illustrates Niagara College's commitment to environmental responsibility. In addition, it 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. Using this approach, Niagara College has the opportunity to implement a profound influence on the region, allowing for alignment with the Regional Municipality of Niagara's community carbon reduction objectives. Lastly, a holistic green procurement policy can help further existing waste reduction and initiatives.

Summary

Since 2009, the majority of Niagara College's corporate carbon footprint has consistently stemmed from stationary combustion and electricity usage. Niagara College has implemented initiatives that will reduce emissions in these two major areas as well as other areas of operations. The NSI Carbon Team looks forward to continuing to work collaboratively towards emissions reductions with Niagara College.

