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RE: Review of Nova Scotia Community College (NSCC) GHG inventory 2018 -2019

Period: 2009 to 2019 inclusive

To whom it may concern:

As requested, we conducted a review of the GHG inventory of NSCC campuses for the years 2009 -2019. For the review process we referred to the GHG Protocol Corporate Accounting and Reporting Standard and the Energy Star Portfolio Manager guides for technical references. We have examined the reported GHG emissions and in our opinion, we are assured that the emissions estimate in the NSCC GHG inventory report for the years 2009 – 2019 has a high degree of certainty and accuracy. Also, we obtained satisfactory answers to the clarifying questions we asked and found acceptable evidence to support the emissions reporting for the test data that we investigated.

A brief summary report on the findings of our review is enclosed.

Best regards,

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Review of the Nova Scotia Community College

Green House Gas Inventory 2018 - 2019

To:

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Prepared by:

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NSCC Ivany Campus

Introduction

The Nova Scotia Community College (NSCC) reports its greenhouse gas (GHG) emissions for over 16 working sites across the province of Nova Scotia, including campuses, learning centres, and offices, as well as mobile emissions from transport. Emissions reported include Scope 1 (direct emissions from fuel combustion from buildings and owned fleet vehicles), Scope 2 (indirect emissions due to energy services produced for NSCC by others, such as electricity and steam supplies), and Scope 3 (emissions caused by staff and students in the course of participating in NSCC activities, such as transport to and from NSCC in vehicles that NSCC does not own).

NSCC has reported these emissions since 2009. For this report, we reviewed the 2019 GHG emissions inventory, which covers the fiscal year 2018-2019, from April 1, 2018 to March 31, 2019. To track progress in GHG emission reduction over time, the inventory also includes data from past years back to 2009.

Review Methodology

1. Preparation of the GHG inventory review

This report was prepared based on the information received from the NSCC Facilities Management, including the GHG emissions inventory spreadsheets, access to energy bill data in the NSCC Energy Star Portfolio Manager account, test samples of electricity, oil, and natural gas bills selected at random by our reviewers, records of rental vehicle and fleet vehicle usage, and the responses to the annual NSCC survey of staff and student transportation choices. Responses to the information requests and questions answered during the review were considered satisfactory.

2. Evaluation of GHG emissions reporting

Choice of reporting standard

NSCC has used GHG Protocol Corporate Accounting and Reporting Standard for reporting its emissions. The emissions reported by the campuses includes direct emissions (Scope 1)

such as stationary combustion of carbon-based fuel sources (fuel oil and natural gas) and emissions from NSCC-owned fleet vehicles. The indirect emissions (Scope 2) reported from the campuses include those emissions caused by the production of electricity and steam purchased from other entities. The organization has also provided optional emissions reporting (Scope 3) from rental vehicles, student and employee commuting, and paper usage.

Our investigation of the emissions inventory spreadsheet found that the calculations in the inventory followed the GHG Protocol Corporate Accounting and Reporting Standard as intended.

Scope 1 and Scope 2 - Sample tests of emissions inventory entries

For the emissions reported under Scope 1 and Scope 2, a sample set of eight invoices for electricity, steam, natural gas, propane, and fuel oil were selected at random and obtained from NSCC to verify whether the emissions inventory entries accurately represented the amount of energy and fuel purchased through those invoices. The eight invoices selected are listed below in Table 1.

Table 1: Sample invoices

Fuel Type	Campus	Billing period (Month / Year)
Electricity	AVC –COGS	09 /2017
	Marconi Campus	10/2019
Fuel Oil	Truro Campus	11/2018
	Lunenburg Campus	12/2017
Natural gas	Akerley Campus	12/2017
	IT Campus	02/2019
Propane	Strait Area Campus	3/2019
Steam	Ivany Campus	04/2018

The estimated usage of the energy sources cited in the invoices were checked with the corresponding entries in Portfolio Manager, and then tracked to the emissions inventory. The entries in Portfolio Manager matched with the invoices for the eight samples tested.

Additionally, we used the standard CO_2 equivalent emission factors for the energy sources specific to Canada and Nova Scotia to verify the accuracy of the GHG emissions inventory. Our independent estimates of the emissions based on these factors were within 5% of the reported values in all cases, and the emissions reported in the inventory were never lower than our estimates. This suggests that the emissions inventory for Scope 1 and Scope 2 is reasonably accurate and does not underestimate the emissions.

Scope 1 and Scope 3 - Transport

NSCC reported emissions from the mobile fleet that it owns (Scope 1), from the rental vehicles its staff uses (Scope 3), and from staff and student commuting (Scope 3).

Fleet Vehicles (Scope 1): Mobile fleet vehicle emissions were estimated from logbooks of distance traveled (odometer readings) and standard fuel efficiency ratings published by the Canadian and USA governments for the makes and models of vehicles in the fleet. We consider this a reasonably accurate method of estimating the GHG emissions from fleet vehicle use. In evaluating the accuracy of the emissions estimate, we did not have time or scope to obtain vehicle logbooks and check odometer readings, therefore this review depends on the assumption that vehicle use logbooks and odometer readings are within an acceptable accuracy, which we believe is likely true.

However, the use of published average fuel efficiency figures has the potential to introduce error, as the vehicles in use may have different fuel efficiency than the published ratings due to driving patterns, weather conditions, and state of maintenance. A more accurate way to estimate GHG emissions from fleet vehicle use would be to capture all the receipts for fuel purchases for these vehicles and multiply total fuel consumption by the GHG emission factors for the fuels.

Rental Vehicles (Scope 3): Similar to the NSCC fleet vehicles, rental vehicle emissions (Scope 3) were estimated by using the odometer readings to determine the distance travelled, and the average published fuel efficiency for the classes of vehicles driven. In this case, the data was collected and provided by the corporate rental company that serves NSCC. This appears to be a reasonably accurate method of estimating rental emissions, with the following caveats: It does not include vehicles rented from other agencies, it excludes use of employees' personal vehicles for College business, and it does not account for possible differences in fuel efficiency in real use (due to driving patterns, traffic, weather, and state of maintenance). As for the fleet vehicles, it would be more accurate to collect the total fuel consumption from the fuel purchase receipts. It's understandable that within the current NSCC expense reporting system, this may be too difficult and require too much staff time.

Student and staff commuting (Scope 3): The estimates of emissions from commuting to the college by students and staff were made using statistical approximations from surveys of staff and students about their commuting mode and distance. We consider this a reasonable and practical approach, although it does have significant inherent uncertainties around whether the survey data is representative of the whole NSCC population, and whether the distances estimated in the survey are accurate. In the student commuting survey, the survey audience was 6579, and the recorded response was over 2837 (43%). This relatively high response rate lends support to the claim that the results are reasonably representative.

The vehicle makes and models used for commuting are not specified in the survey, therefore the emissions per kilometre can only be an approximate average based on general emission factors. As such, this method has a fairly high degree of uncertainty. Nevertheless, given the resources available it may be the only currently feasible way of estimating these emissions.

Scope 3 - Paper

We wish to congratulate NSCC in bringing an estimate of GHG emissions due to paper consumption into the inventory for the first time in 2019. As a commodity item consumed in large quantities at the College, accounting for paper represents a step forward in making the GHG inventory more comprehensive.

The methodology used appears to be sound. Records of paper purchases from the single preferred supplier are likely to be very accurate, and the GHG emission factors developed by the Government of British Columbia are expected to be reliable.

Many other products are purchased by NSCC in its ongoing operations – water, construction materials, chemicals, equipment, etc. The GHG emissions associated with these purchases remain unaccounted for in the inventory. This is considered acceptable because these emissions would be prohibitively difficult to quantify with the amount of data and time resources available for the inventory. Future inventories might consider more of the purchased goods and services if this becomes feasible.

Evaluation and consideration of uncertainty

The emission factors used in the estimation of the GHG values were taken from US EPA's emission factors for GHG inventories before 2018. In the fiscal year 2018 – 2019, GHG emission factors for energy sources specific to Canada and Nova Scotia were used in the report. The emission factors are from reliable sources, and the quantities consumed appear to be fully reported, therefore the degree of uncertainty from the reported emissions is low for scope 1 (stationary combustion) and scope 2 (electricity and steam).

The Scope 3 emissions from student and employee commuting were estimated based on the survey responses. These emission estimates have a relatively high degree of uncertainty, however the method used appears to be the best available at present.

3. Conclusion

In our opinion, the GHG inventory reported by the NSCC from the years 2009 – 2019 is reasonably accurate, follows standard protocols for emission reporting where available, and is presented fairly. The inclusion of paper and commuting emissions in recent years as opposed to the previous years, would increase the total accounted Scope 3 emissions. The Scope 1 and Scope 2 emission methodologies have been kept consistent from year-to-year to measure emission reductions. In conclusion, we have reasonable assurance that the reported emissions are as accurate as they can be, given the scope and resources available.