University of Guelph
Greenhouse Gas Report 2018
O.Reg. 390/18

Steve Nyman, P.Eng.
Director, Maintenance and Energy Services
Physical Resources
University of Guelph
50 Stone Road East
Guelph, Ontario
N1G 2W1

Re: Ontario Regulation (O.Reg.) 390/18 Greenhouse Gas Emissions: Quantification, Reporting and Verification

Dear Mr. Nyman,

We are pleased to report that on behalf of the University of Guelph, Doherty Engineering Inc. has completed the submission of mandatory greenhouse gas ("GHG") reporting for the compliance period of January 1, 2018 to December 31, 2018 to the Ministry of Environment Conservation and Parks ("MOECP"). This annual submission is required under Ontario Regulation 390/18 for emitters of 10,000 tonnes or greater of greenhouse gases ("tCO_2e"). The submission was finalized and formally submitted on the Environment Canada 'Single Window' online system on May 27, 2019.

For your records, we have attached the submission report for the 2018 compliance year. Further correspondence will follow pertaining to the mandatory third-party verification of this years' submission required under O. Reg. 390/18 on or before September 1, 2019.

For your information, we have also included in this report a brief comparison of the last four years' (2015 – 2018) energy consumption and related greenhouse gas emissions with regard to natural gas ("NG"), electricity, and other sources used on campus, as well as normalization of the data to the weather.

The major emissions sources located at the University come from the stationary combustion of natural gas in five (5) low NO_x wall-fired boilers. Additional de minimis emissions come from the combustion of No. 2 fuel oil in the emergency generators.

Should you have any questions or concerns regarding the above, please do not hesitate to contact the undersigned at your convenience.

Sincerely,

Aline McMullen, M.Sc., EP, CEM®
Doherty Engineering Inc.
289-838-2302

Cc : Trevor Kanerva, CEM® (University of Guelph)

1. GENERAL STATIONARY COMBUSTION

The following accounts are reported annually by the University of Guelph to the Ministry of the Environment ("MOE") as part of the mandatory greenhouse gas reporting:

TABLE 1. GENERAL STATIONARY COMBUSTION

Campus Account	Fuel Source	Related Emissions
Major Natural Gas	Natural Gas	CO_2, CH_4, N_2O
Minor Natural Gas	Natural Gas	CO_2, CH_4, N_2O
Student Housing Natural Gas	Natural Gas	CO_2, CH_4, N_2O
Transit Petroleum[1]	Fuel Oil[2]	CO_2, CH_4, N_2O

Each of these accounts contribute to the overall fossil fuel consumption on campus related to general stationary combustion.

Fossil fuel consumption on campus related to stationary combustion and the related greenhouse gas emissions for the last four (4) years can be found in the table below. The numbers have been adjusted to follow current (2019) MOE reporting standards in the greenhouse gas reporting guidelines.

TABLE 2. FOSSIL FUEL CONSUMPTION AND RELATED GREENHOUSE GAS EMISSIONS

	2015	2016	2017	2018
NG Consumption (m^3)	22,430,378	20,588,771	20,645,023	21,015,450
No. 2 Fuel Oil Consumption (kl)	Not reported	51	36	79
GHG Emissions from NG (tCO_2e)	42,044	38,597	38,703	39,397
GHG Emissions from No. 2 Fuel Oil (tCO_2e)	Not reported	137	96.6294	214
Total GHG Emissions (tCO_2e)	**42,044**	**38,734**	**38,800**	**39,611**

Natural gas consumption and related greenhouse gas emissions at the University of Guelph showed a sharp decline between 2015 and 2016 (Figure 2). Natural gas consumption and greenhouse gas emissions increased slightly in 2017 and gradually increased again in 2018.

As there is no data for No. 2 fuel oil consumption in 2015 it is difficult to notice a trend in No. 2 fuel oil consumption (Figure 3). However, as No. 2 fuel oil consumption is primarily used for backup emergency generators and does not tend to vary with external factors, it is not expected to see a trend in No. 2 fuel oil consumption between years.

[1] Fuel oil supplier – delivers fuel oil to campus
[2] #2 ULS furnace oil, #2 ULS diesel

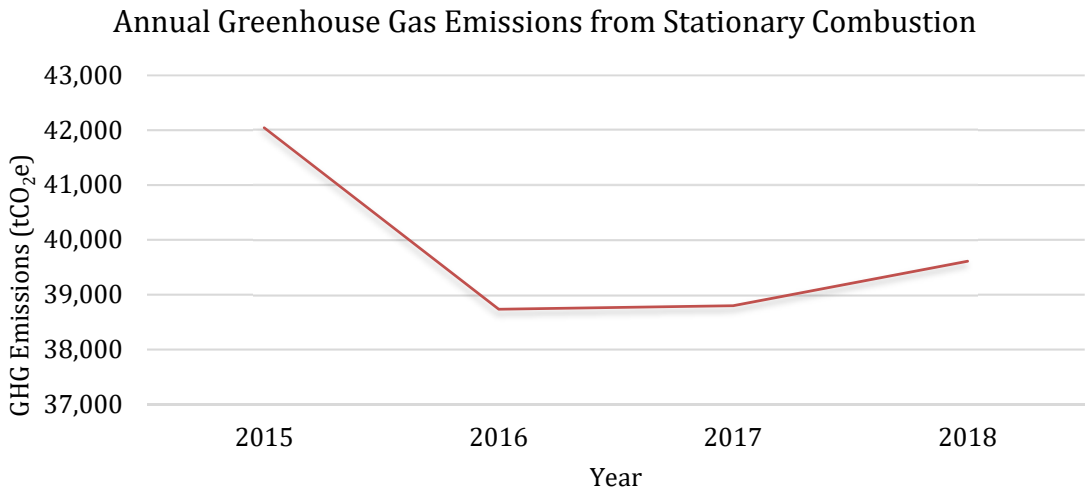

FIGURE 1. OVERALL TREND OF GREENHOUSE GAS EMISSIONS FROM STATIONARY COMBUSTION SOURCES

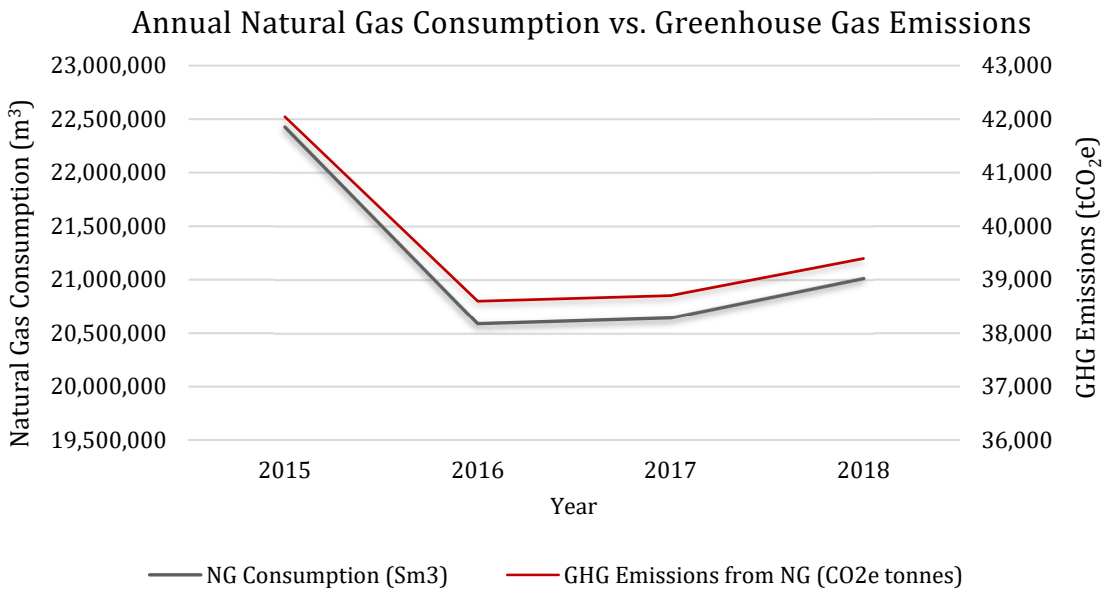

FIGURE 2. ANNUAL NATURAL GAS CONSUMPTION AND RELATED GREENHOUSE GAS EMISSIONS

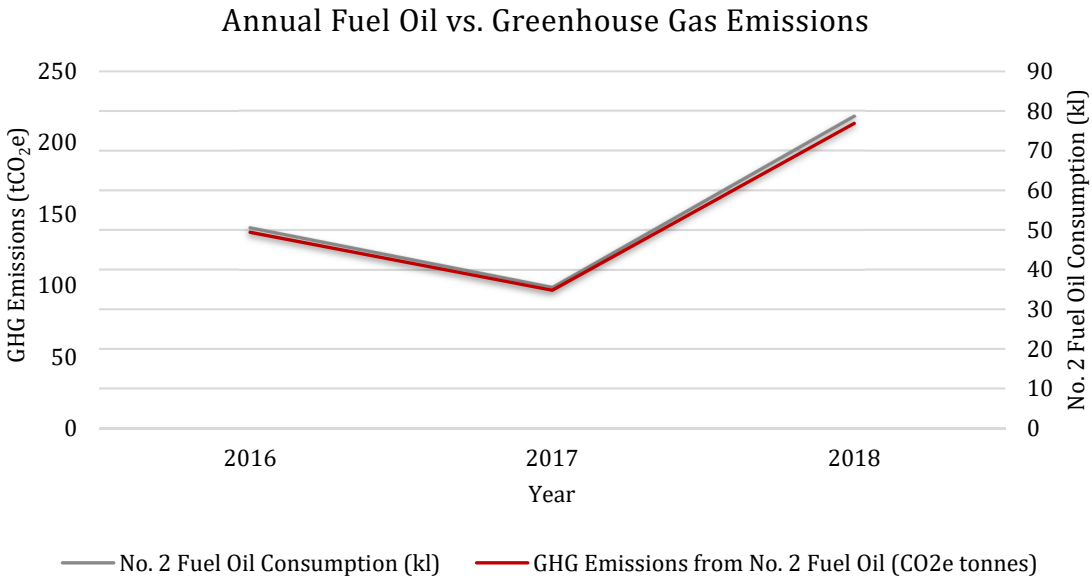

FIGURE 3. OVERALL FUEL OIL CONSUMPTION AND RELATED GREENHOUSE GAS EMISSIONS. *2015 HAS BEEN OMITTED DUE TO LACK OF DATA

2. ELECTRICITY

The following accounts are not required to be reported to the MOECP but have been included in this report to provide a more comprehensive look at the University's energy usage and overall greenhouse gas contribution.

TABLE 3. ELECTRICITY ACCOUNTS

Campus Account	Fuel Source	Related Emissions
Major Hydro	Hydro[3]	Zero
	Alternative[4]	CO_2, CH_4, N_2O (indirect)
	Nuclear[5]	CO_2, CH_4, N_2O (indirect)
	Natural Gas	CO_2, CH_4, N_2O
Minor Hydro	Hydro	Zero
	Alternative	CO_2, CH_4, N_2O (indirect)
	Nuclear	CO_2, CH_4, N_2O (indirect)
	Natural Gas	CO_2, CH_4, N_2O
Student Housing Hydro	Hydro	Zero
	Alternative	CO_2, CH_4, N_2O (indirect)
	Nuclear	CO_2, CH_4, N_2O (indirect)
	Natural Gas	CO_2, CH_4, N_2O

The electricity supply mix for Ontario, as reported by the Ontario Energy Board ("OEB") for the years 2015 to 2018 are as follows:

TABLE 4. ONTARIO'S ELECTRICITY SUPPLY MIX 2015 - 2018

Source of Electricity	2015	2016	2017	2018[6]
Hydro	23.2%	23.3%	25.6%	25.0%
Alternative	8.7%	9.5%	9.8%	9.3%
Nuclear	57.8%	58.5%	60.1%	61.0%
Natural Gas	9.7%	8.2%	4.0%	6.0%
Other	0.5%	0.4%	0.3%	0.0%

[3] Hydroelectricity is considered a non-emitter by Natural Resources Canada. Source: https://www.nrcan.gc.ca/energy/facts/energy-ghgs/20063
[4] Alternative fuel sources include: solar, wind, biomass, waste and are considered non-emitters by Natural Resources Canada. Source: https://www.nrcan.gc.ca/energy/facts/energy-ghgs/20063
[5] Nuclear is considered a non-emitter by Natural Resources Canada. Source: https://www.nrcan.gc.ca/energy/facts/energy-ghgs/20063
[6] 2018 electricity supply mix is based on the IESO's electricity data. Source: http://www.ieso.ca/en/Corporate-IESO/Media/Year-End-Data

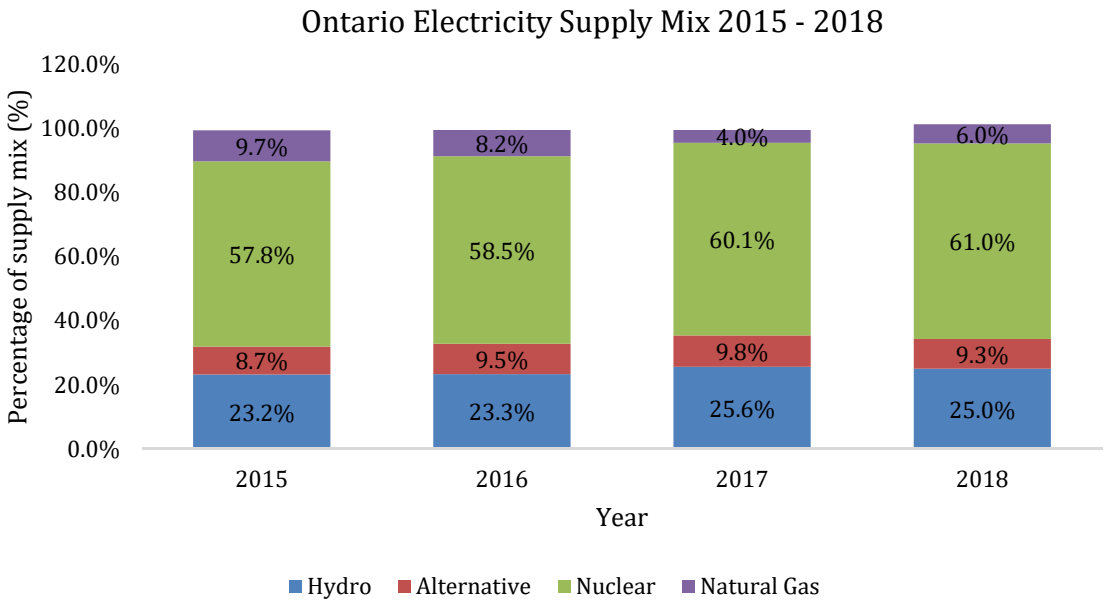

FIGURE 4. ONTARIO'S ELECTRICITY SUPPLY MIX AS REPORTED BY THE OEB AND IESO[6]

For the purpose of this report, "Other" source of electricity was considered negligible as no accurate data could be found to determine the combination of fuel sources that made up the "Other" fuel supply in the Ontario electricity mix. As they do not directly emit greenhouse gases during the electricity generation stage, nuclear and renewable resources are regarded as emission-free energy sources by Natural Resources Canada (NRCAN, 2019)[7]. It should be noted however, that the related standard operating and maintenance activities of these technologies require energy inputs, many of which involve the use of fossil fuels and therefore contribute to the overall greenhouse gas emissions output. This report includes the associated greenhouse gas emissions related to electricity consumption at the University of Guelph.

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NRCAN. (2019, May 27). *Natural Resources Canada*. Retrieved from https://www.nrcan.gc.ca/energy/facts/energy-ghgs/20063

The University's electricity consumption was as follows for the years 2015 to 2018:

TABLE 5. ANNUAL ELECTRICITY CONSUMPTION (KWH)

	2015	2016	2017	2018
Electricity Consumption (kWh)	105,400,979	104,767,879	99,379,975	97,757,892

Based on the OEB's electricity supply mix (Table 4), the University of Guelph's electricity consumption can be broken down into the following approximate amounts from each of the supply mix sources (Table 6 and Figure 5).

TABLE 6. ELECTRICITY CONSUMPTION (KWH) PER ELECTRICITY SUPPLY MIX SOURCE.

	2015	2016	2017	2018
Hydro (kWh)	22,679,831	22,777,589	25,026,020	24,439,473
Alternative (kWh)	8,504,937	9,287,000	9,580,273	9,091,484
Nuclear (kWh)	56,504,061	57,188,367	58,752,493	59,632,314
Natural Gas (kWh)	9,482,516	8,016,147	3,910,316	5,865,474
Other (kWh)	488,789	391,032	293,274	No Data

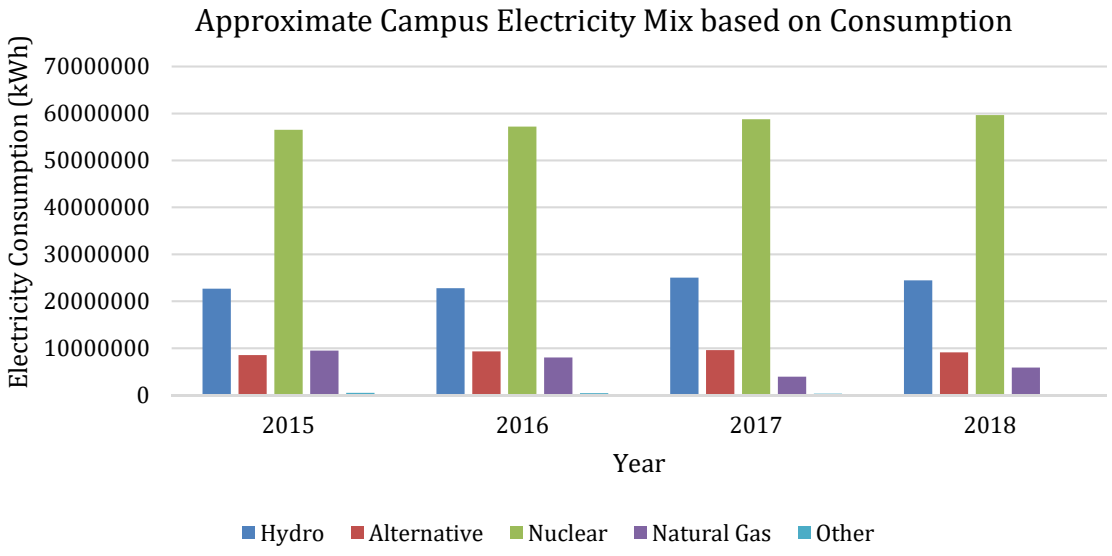

FIGURE 5. ANNUAL CAMPUS ELECTRICITY MIX BASED ON CONSUMPTION (KWH) AND ONTARIO SUPPLY MIX.

To determine the greenhouse gas emissions associated with electricity consumption at the University, the approximate amount of the overall campus variable consumption that came from each source in the electricity supply mix (Table 6) was determined based on the percentage in the electricity supply mix (Table 4). Once the sources of electricity and the

campus electricity consumption related to each source were determined, the approximate greenhouse gas emissions related to electricity consumption were calculated using emission rates associated with each technology obtained from Intrinsik, 2016[8] (Table 7). Based on these reported emissions rates, the largest contributor to greenhouse gas emissions from the Ontario electricity supply mix is evidently electricity generated from the direct combustion of fossil fuels (natural gas in this case). The second largest contributor of electricity generation related greenhouse gas emissions in Ontario, is through generation by alternative energy sources (solar, wind, biomass and waste), and the least amount from nuclear power generation, apart from hydroelectric power generation which is considered to contribute zero greenhouse gas emissions. Therefore, based on the total consumption of electricity at the University of Guelph for the years 2015 to 2018, the University contributed an average of 3,651 tonnes of CO_2e to the atmosphere from electricity usage (Table 7).

TABLE 7. GREENHOUSE GAS EMISSIONS FROM ELECTRICTIY CONSUMPTION AT THE UNIVERSITY OF GUELPH BASED ON THE ONTARIO ELECTRICITY SUPPLY MIX (OEB, 2018)[9].

	Emission Rates[10] (gCO_2e/kWh)	**Greenhouse gas emissions (tCO_2e)**			
		2015	**2016**	**2017**	**2018**
Hydroelectric	0	0	0	0	0
Alternative	6.89	59	64	66	63
Nuclear	0.15	8	9	9	9
Natural Gas	525	4,978	4,208	2,053	3,079
	TOTAL	**5,045**	**4,281**	**2,128**	**3,151**

8 Intrinsik. (2016). *Greenhouse gas emissions associated with various methods of power generation in Ontario.*

9 OEB. (2018). Ontario's System-Wide Electricity Supply Mix. Retrieved from Ontario Energy Board: https://www.oeb.ca/sites/default/files/2017-supply-mix-data.pdf

10 Intrinsik. (2016). *Greenhouse gas emissions associated with various methods of power generation in Ontario.*

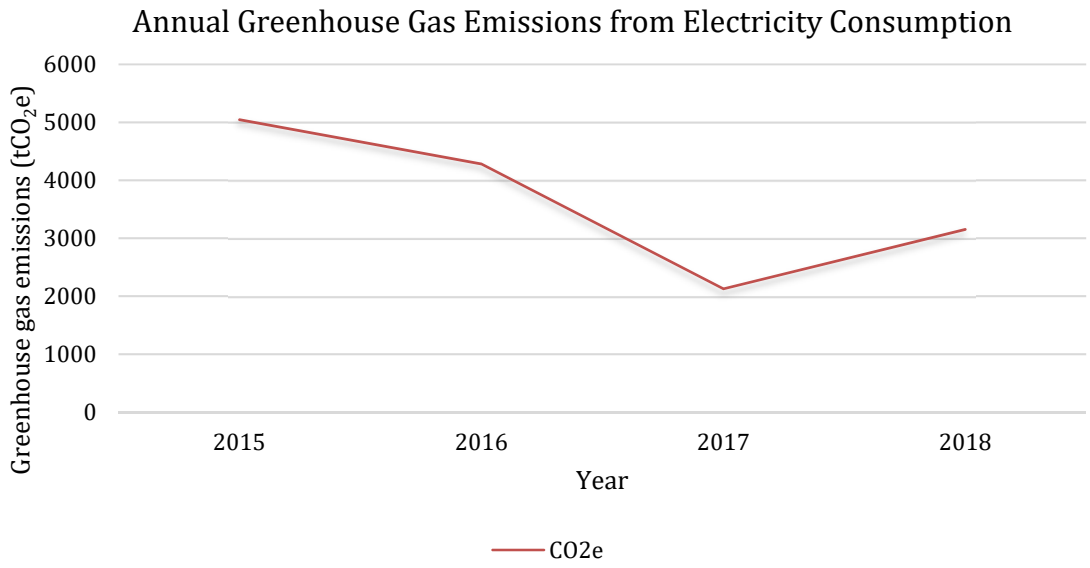

FIGURE 6. ANNUAL GREENHOUSE GAS EMISSIONS FROM ELECTRICITY CONSUMPTION AT THE UNIVERSITY OF GUELPH, 2015-2018.

As shown in Figure 6 above, the amount of greenhouse gas emissions due to electricity consumption decreased between 2015 and 2017, with the lowest emissions occurring in 2017. Greenhouse gas emissions increased in 2018. When referencing the Ontario electricity supply mix in 2018, it can be assumed that the increase in greenhouse gas emissions in 2018 can be attributed to an increased amount of electricity being generated by natural gas sources in 2018 compared to in 2017.

3. ENERGY CONSUMPTION AS IT RELATES TO WEATHER

To better understand the greenhouse gas trends for the stationary combustion and electricity consumption reported above, the data was normalized to the weather for the last 30 years, to account for any trends in the climate. For the purposes of this report, only normalized energy consumption with variable loads which are affected by changes in the weather were evaluated. Therefore, No. 2 fuel oil consumption was not normalized.

Annual energy consumption totals for natural gas and electricity, as well as their resulting greenhouse gas emissions, were normalized to the weather based on the total average monthly heating ("HDD") and cooling degree days ("CDD") for the last 30 years with reference to HDD and CDD in each year from 2015 to 2018 (RETScreen, 2019)[11]. An HDD below 18°C and a CDD above 18°C were used. Below are the overall trends in HDD and CDD from 2015 to 2018, to better understand the anticipated loads for each of those years.

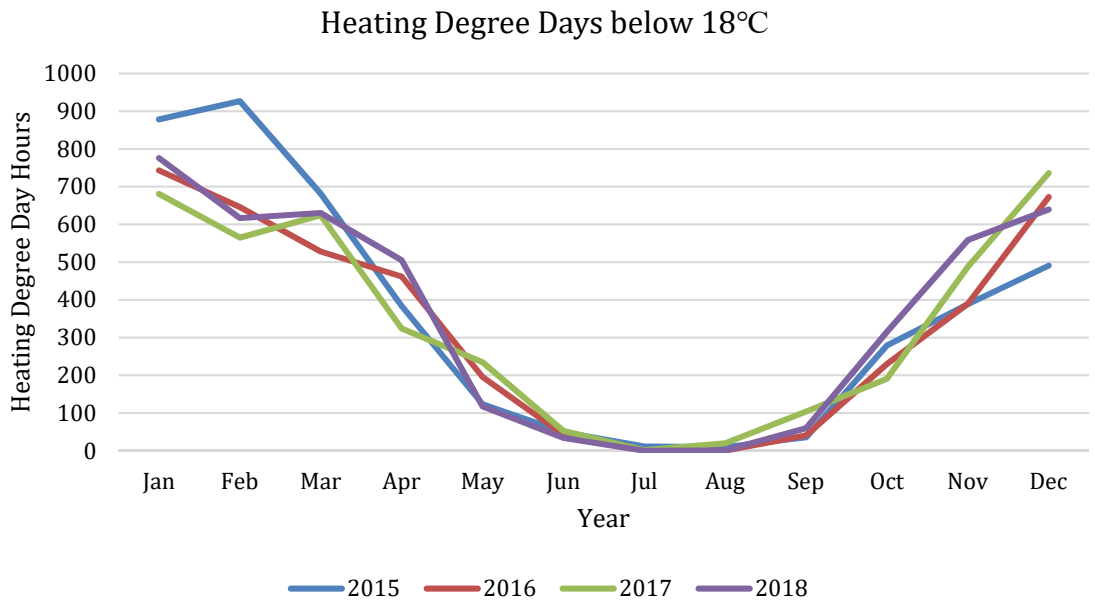

FIGURE 7. APPROXIMATE ANNUAL HEATING DEGREE DAY HOURS AT THE UNIVERSITY OF GUELPH 2015-2018

[11] RETScreen. (2019, 06 01). RETScreen Expert. (NASA, Compiler) Guelph, Ontario, Canada: NASA.

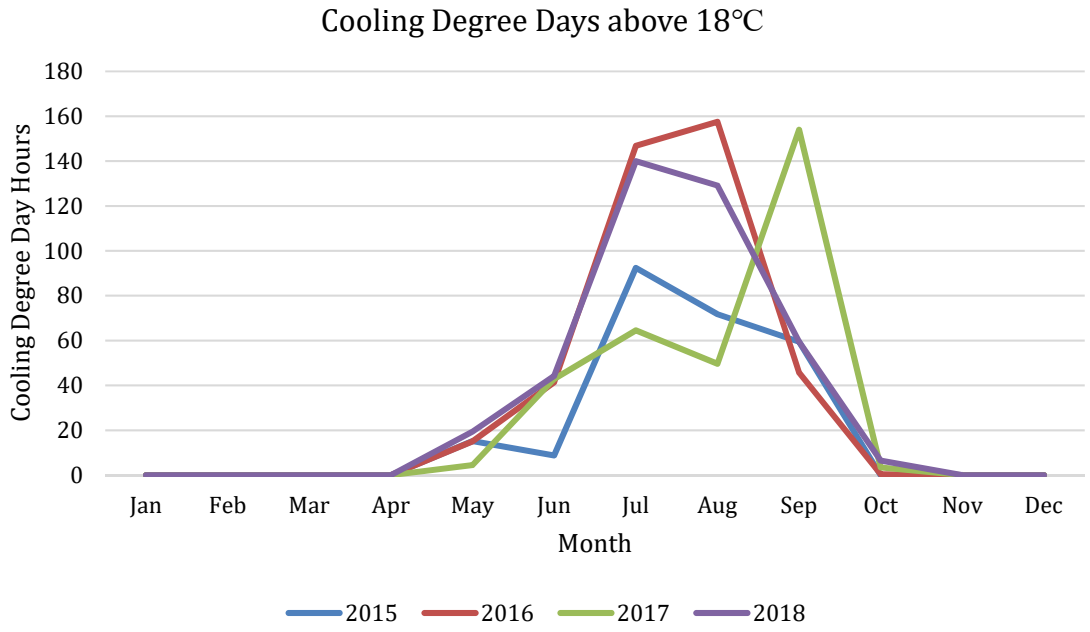

FIGURE 8. APPROXIMATE ANNUAL COOLING DEGREE DAY HOURS AT THE UNIVERSITY OF GUELPH 2015-2018

3.1. Natural Gas Consumption Normalization

Based on the above HDD trend and the 30 year average monthly HDD in Guelph, Ontario (RETScreen, 2019)[12] normalized natural gas consumption data and resultant greenhouse gas emissions can be found in Table 8 below. The overall annual trend for the normalized greenhouse gas emissions from natural gas combustion on campus is shown in Figure 9.

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RETScreen. (2019, 06 01). RETScreen Expert. (NASA, Compiler) Guelph, Ontario, Canada: NASA.

TABLE 8. ANNUAL NORMALIZED AND ANNUAL REPORTED CONSUMPTION AND RESULTANT GHG EMISSIONS DATA FROM NATURAL GAS USE

	2015	2016	2017	2018
Reported Consumption (m^3)	22,430,378	20,588,771	20,645,023	21,015,450
Normalized Consumption (m^3)	21,879,213	20,554,829	20,252,759	19,047,873
Reported GHG emissions (tCO_2e)	42,050	38,597	38,703	39,276
Normalized GHG emissions (tCO_2e)	41,017	38,534	37,968	35,709

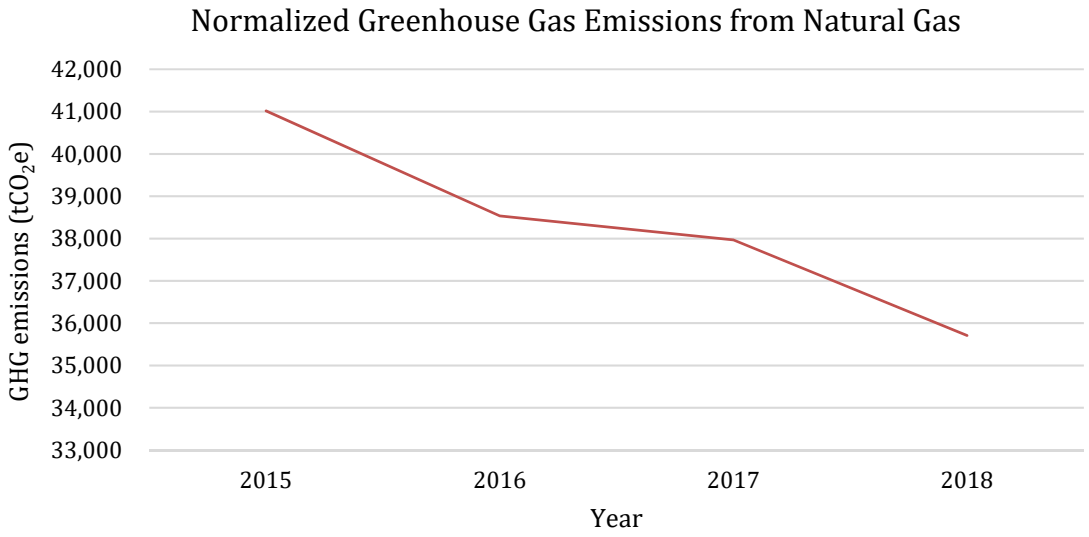

FIGURE 9 ANNUAL NORMALIZED GREENHOUSE GAS EMISSIONS FROM NATURAL GAS COMBUSTION ON CAMPUS.

From the data in Table 8 and Figure 9 above, we see a downward trend in greenhouse gas emissions when we normalize consumption with the weather.

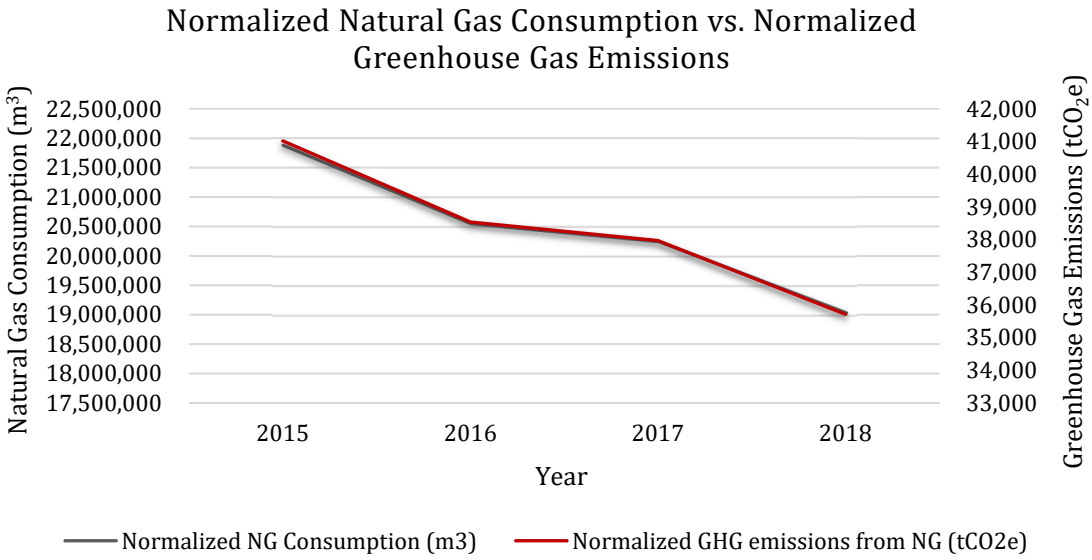

FIGURE 10 ANNUAL NORMALIZED NATURAL GAS CONSUMPTION RELATIVE TO ANNUAL NORMALIZED GREENHOUSE GAS EMISSIONS.

Figure 10 above shows the comparison between normalized natural gas consumption and normalized greenhouse gas emissions. The trend of normalized data in Figure 10, shows that greenhouse gas emissions decrease at a similar rate to natural gas consumption. Between 2015 and 2018 natural gas consumption and greenhouse gas emissions have steadily decreased.

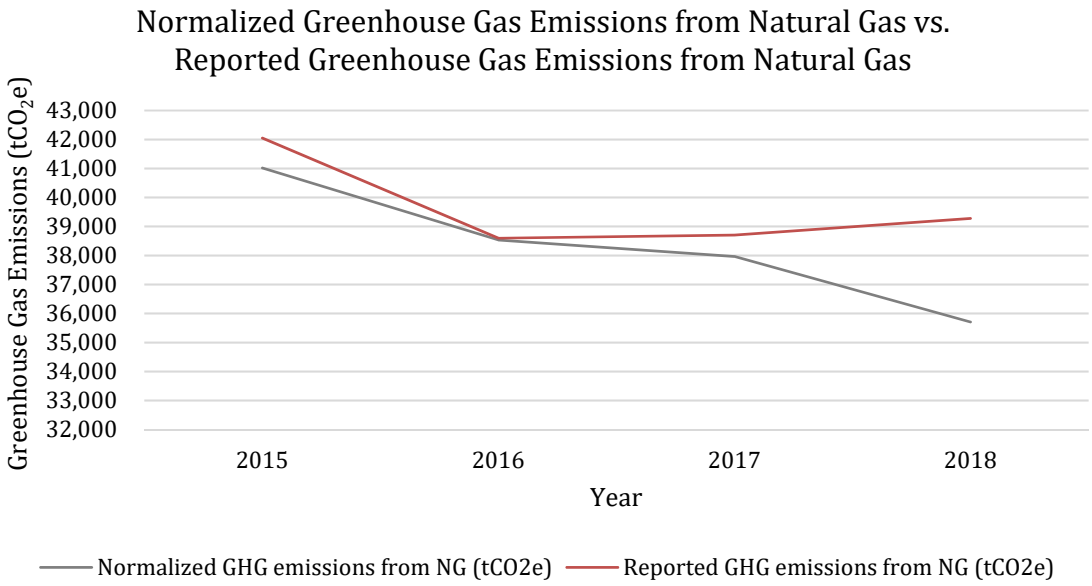

FIGURE 11. NORMALIZED GREENHOUSE GAS EMISSIONS FROM NATURAL GAS CONSUMPTION COMPARED WITH REPORTED GREENHOUSE GAS EMISSIONS FROM NATURAL GAS CONSUMPTION

The data in Table 8 and in Figure 11 above, show that while the reported consumption and emissions from natural gas in 2018 appear to be higher than in 2017, the normalized figures show a decrease in consumption and emissions. Based on the normalized data, consumption and greenhouse gas emissions from natural gas have been trending downward since 2015.

Figures 12 and 13 below show the overall monthly trend of the normalized and reported natural gas consumption data between the years 2015 to 2018.

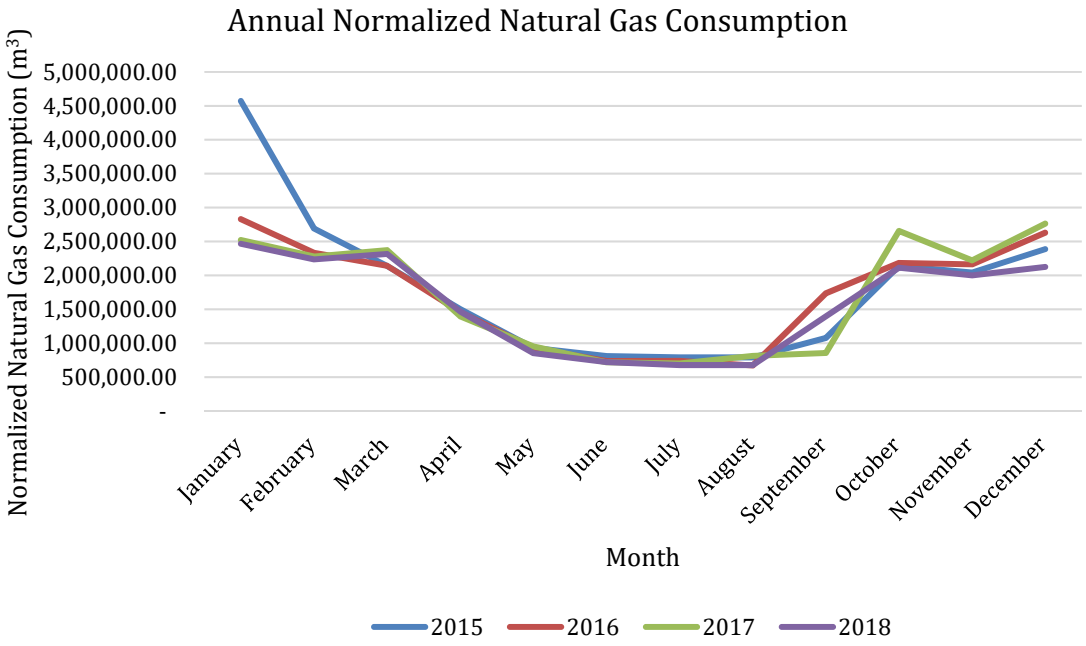

FIGURE 12. ANNUAL NORMALIZED NATURAL GAS CONSUMPTION AT THE UNIVERSITY OF GUELPH

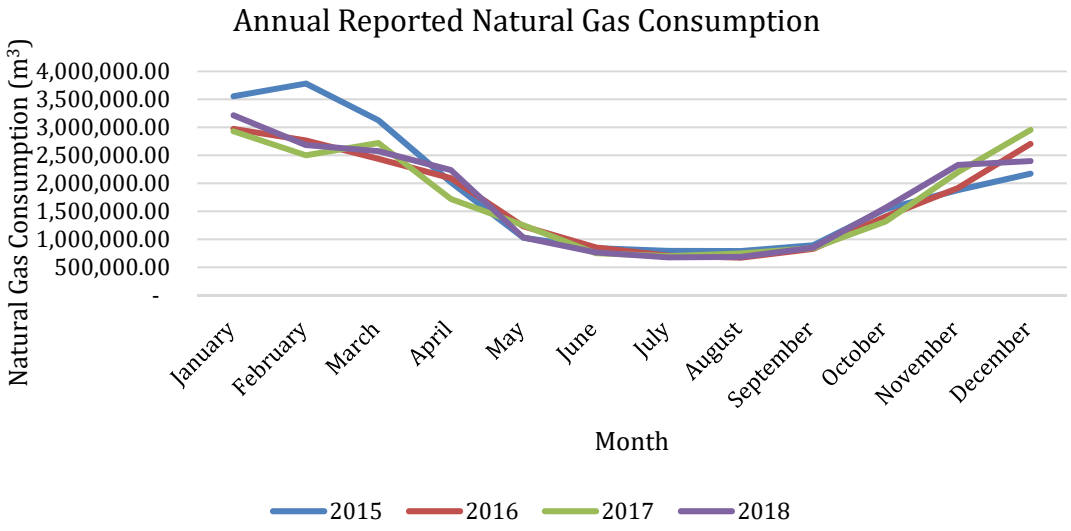

FIGURE 13. ANNUAL REPORTED NATURAL GAS CONSUMPTION AT THE UNIVERSITY OF GUELPH

3.2. Electricity Consumption Normalization

Based on the above CDD trend (Figure 8) and the 30 year average monthly CDD in Guelph, Ontario (RETScreen, 2019)[13] normalized variable electricity consumption data and resultant greenhouse gas emissions can be found in Table 9 below. The overall annual trend for the normalized greenhouse gas emissions from electricity consumption on campus is shown in Figure 14.

TABLE 9 ANNUAL NORMALIZED AND ANNUAL REPORTED CONSUMPTION AND RESULTANT GHG EMISSIONS DATA FROM ELECTRICITY USE

	2015	2016	2017	2018
Reported Consumption (kWh)	105,400,979	104,767,879	99,379,975	97,757,892
Normalized Consumption (kWh)	101,210,593	98,755,713	95,299,843	90,720,141
Reported GHG emissions (tCO_2e)	5,045	4,281	2,128	3,151
Normalized GHG emissions (tCO_2e)	5,224	4,325	2,074	2,918

13

RETScreen. (2019, 06 01). RETScreen Expert. (NASA, Compiler) Guelph, Ontario, Canada: NASA.

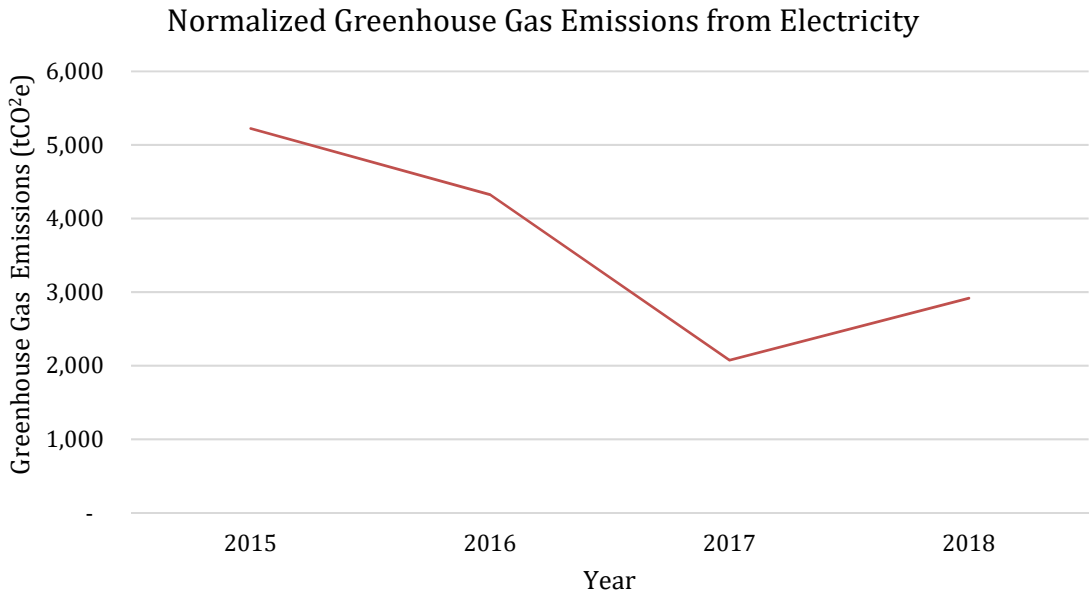

FIGURE 14. ANNUAL NORMALIZED GREENHOUSE GAS EMISSIONS FROM ELECTRICITY CONSUMPTION ON CAMPUS.

The data in Table 9 and Figure 14 above, show a decrease in the weather normalized greenhouse gas emissions associated with electricity consumption between 2015 and 2017. Greenhouse gas emissions began to increase in 2018. This increase in greenhouse gas emissions can be attributed to an increase in natural gas generation in the Ontario electricity supply mix in 2018 as compared to 2017 (Table 4).

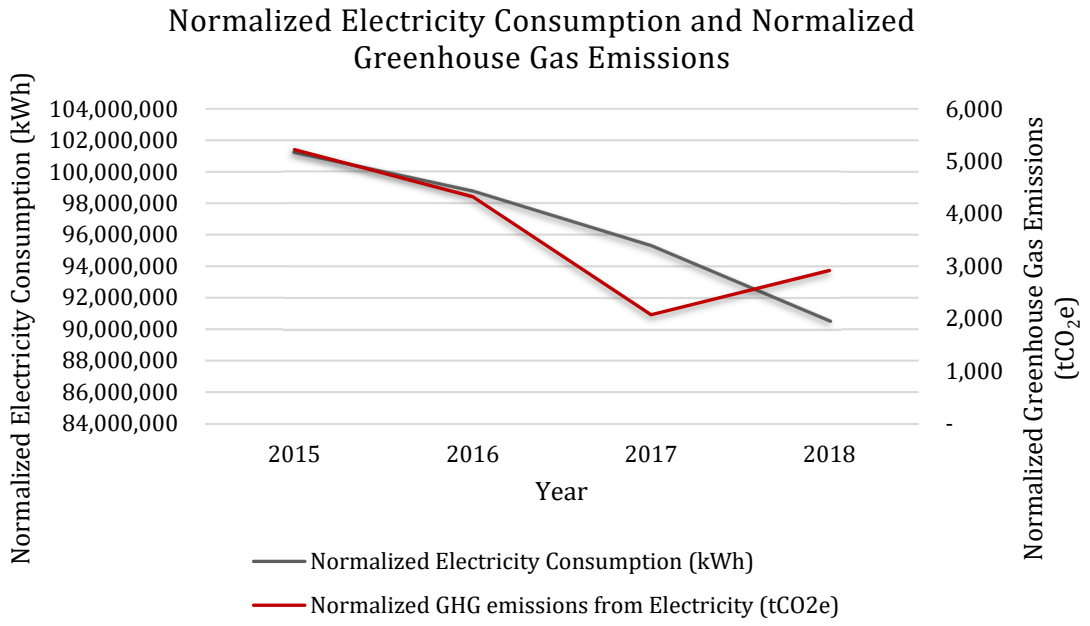

FIGURE 15. ANNUAL NORMALIZED ELECTRICITY CONSUMPTION RELATIVE TO ANNUAL NORMALIZED GREENHOUSE GAS EMISSIONS.

Figure 15 above shows the comparison between trends in normalized annual electricity consumption and normalized greenhouse gas emissions associated with electricity consumption. Figure 15 shows a gradual decline in electricity consumption between 2015 and 2018. Normalized greenhouse gas emissions also decrease, with a gradual decline between 2015 and 2016 and a sharp decline from 2016 to 2017. In 2018, greenhouse gas emissions begin to increase sharply. It is assumed that this sharp increase in greenhouse gas emissions is attributed to a change in the Ontario electricity supply mix, with more electricity generation coming from natural gas sources, that emit a greater amount of greenhouse gases.

In general, greenhouse gas emission trends follow consumption trends, however, as can be seen in Figure 15, these trends can be largely influenced by the source(s) of electricity. In 2018, campus electricity consumption is at its lowest point; however, the greenhouse gas emissions trend shows an increase in greenhouse gas emissions. In 2018 the Ontario electricity supply mix generated 6% of its supply come from natural gas generation, compared to 2017 when only 4% of its supply came from natural gas electricity generation.

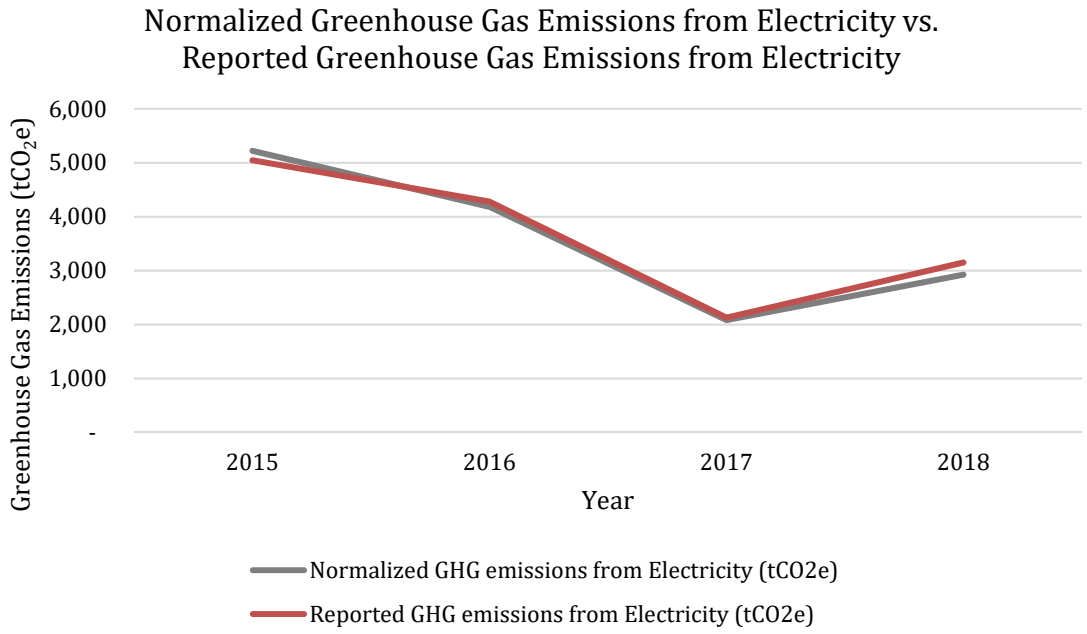

FIGURE 16. NORMALIZED GREENHOUSE GAS EMISSIONS FROM ELECTRICITY CONSUMPTION COMPARED WITH REPORTED GREENHOUSE GAS EMISSIONS FROM ELECTRICITY CONSUMPTION.

From the data in Table 9 and in Figure 16 above, the reported greenhouse gas emissions from electricity follow the trend of the normalized figures closely. Overall, greenhouse gas emissions from electricity appear to decline between 2015 and 2017 and increase in 2018 (Figure 16). As mentioned, greenhouse gas emissions from electricity consumption are largely influenced by the Ontario electricity supply mix, therefore the annual greenhouse gas emissions associated with campus electricity consumption are in part a reflection of the years' electricity supply mix.

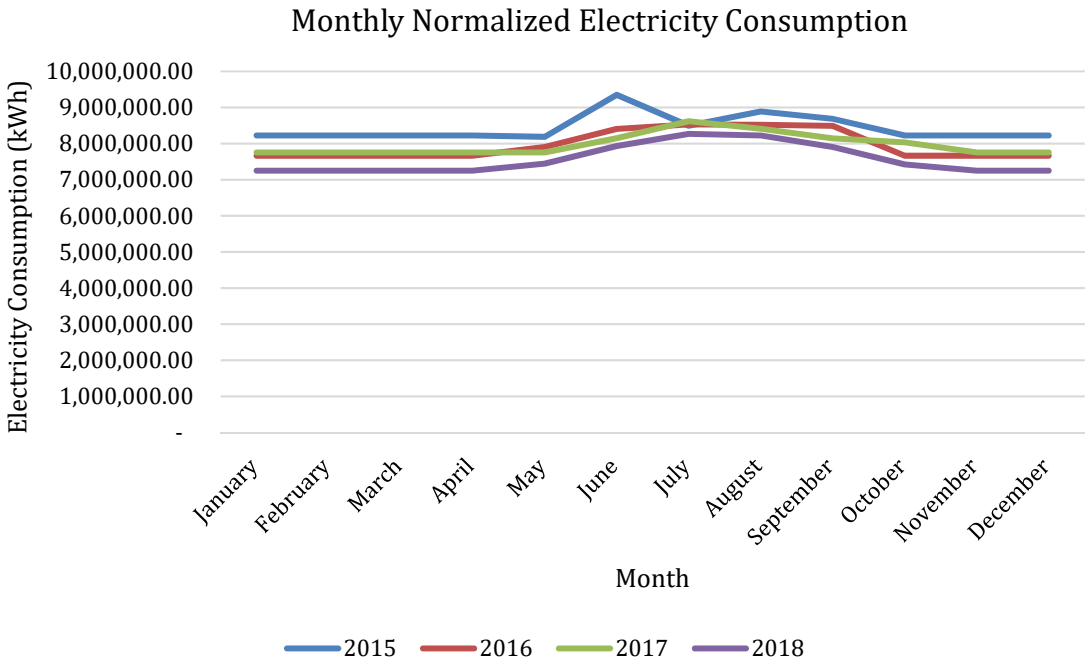

FIGURE 17. ANNUAL NORMALIZED ELECTRICITY CONSUMPTION PER MONTH

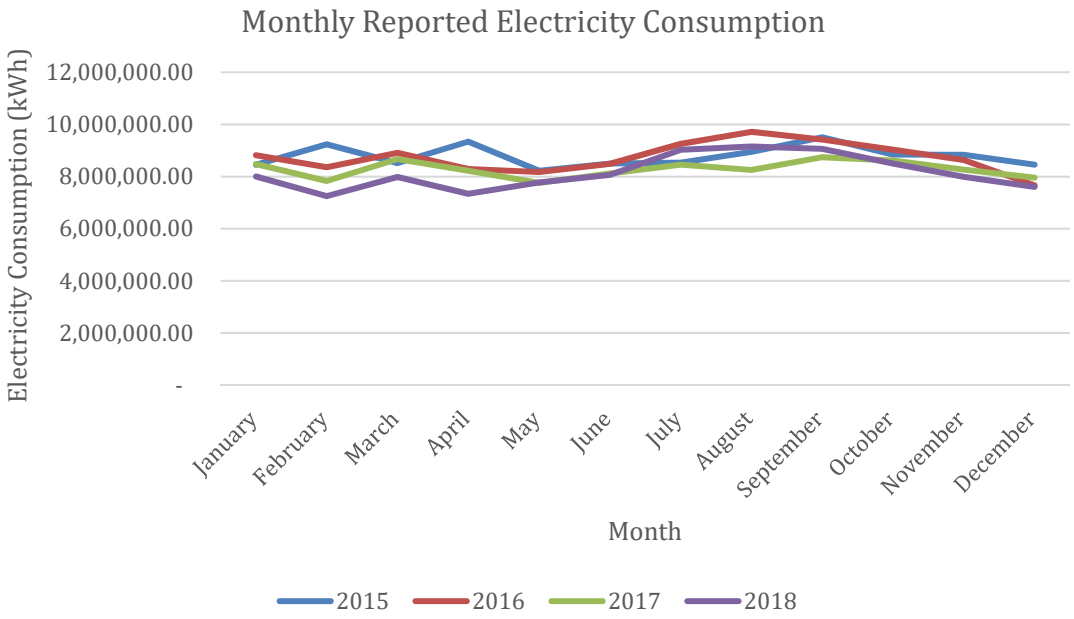

FIGURE 18. ANNUAL REPORTED ELECTRICITY CONSUMPTION PER MONTH

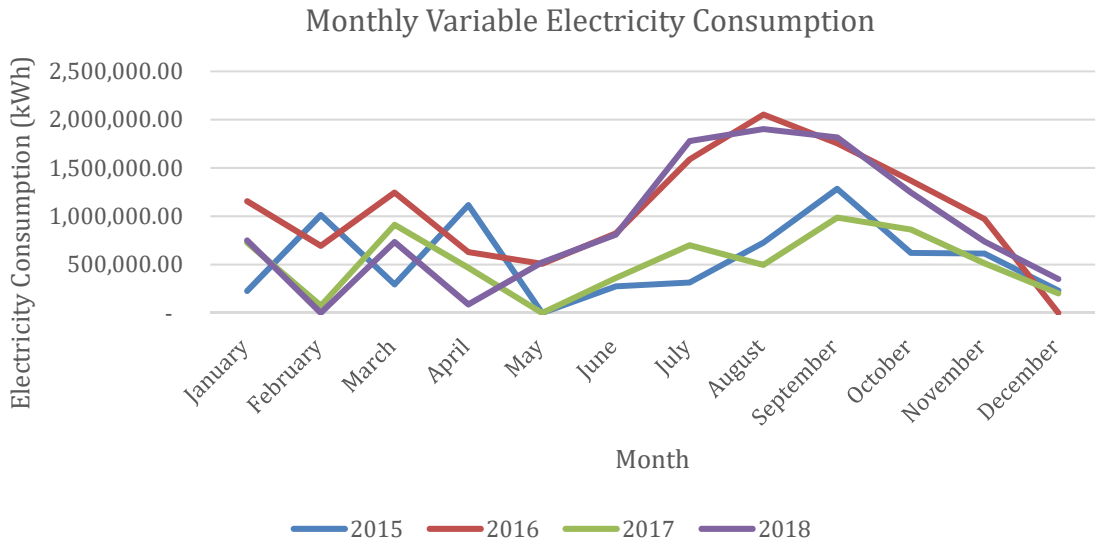

FIGURE 19. ANNUAL VARIABLE ELECTRICITY CONSUMPTION PER MONTH.

Figures 17, 18 and 19 above show the overall monthly trend of the normalized, reported (variable + baseload) and variable electricity consumption data between the years 2015 to 2018.

4. SUMMARY

Overall, from the normalized energy consumption and the resultant greenhouse gas emissions data, there has been a decline in the consumption of energy at the University of Guelph since 2015. Greenhouse gas emissions from natural gas combustion are decreasing with reduced consumption. Electricity consumption on campus is decreasing as well. Greenhouse gas emissions from electricity consumption, however, are influenced by the Ontario electricity supply mix and therefore follow the overall trend of the supply mix.

Greenhouse gas emissions are an important factor to consider when evaluating campus energy usage and its sources, as they represent a large portion of the University's contribution to global warming and climate change. Facilities in Canada, such as the University of Guelph, make a conscious effort to recognize and track these emissions by annually reporting their greenhouse gas emissions from stationary combustion sources on campus as carbon dioxide equivalents (CO_2e). By continuing to monitor these emissions and recognizing their sources, facilities such as the University of Guelph have a better understanding of the emissions footprint and can work toward decreasing their greenhouse gas emissions contribution, as can be seen in the decline of energy consumption and emissions at the University of Guelph.

Report Preview

Company Details

Name

University of Guelph

Address

50 Stone Road East, Guelph (Ontario)

Report Details

Report Status:

Submitted

Facility Name:

Guelph Campus

Facility Mailing Address:

50 Stone Road East, Guelph (Ontario)

Facility Physical Address

50 Stone Road, Guelph (Ontario)

National Pollutant Release Inventory Identifier

7328

NAICS Code(s)

Code	Description	NAICS Priority
611310	Universities	

Activity Details

Activities

Verify Information

Organization Details

Legal Name *

University of Guelph

English Trade Name

French Trade Name	
Business Number **	108161829
Physical Address *	50 Stone Road, Guelph, Ontario, Canada, N1G 2W1

Reporter Details

Name	Guelph Campus
ON GHG ID *	1151 (Assigned by Ontario MECP)
CITSS Entity ID	
GHGRP ID	G10808
NPRI ID	7328
Physical Address	50 Stone Road, Guelph, Ontario, Canada, N1G 2W1

Mailing Address

Delivery Mode	
PO Box	
Rural Route Number	
Address Line 1 **	50 Stone Road East
City **	Guelph
Province **	Ontario
Postal Code **	N1G 2W1
Country *	Canada

NAICS Code(s) *

Code	Description	NAICS Priority
611310	Universities	Primary

Technical Contact

Given Name *	Meagan
Family Name *	Marcyniuk
Email Address	mmarcyniuk@dohertyengineering.ca
Fax	8553343645
Telephone Number *	4162003225

Mailing Address

Delivery Mode	
PO Box	
Rural Route Number	
Address Line 1 **	102 - 6780 Campobello Road
City **	Mississauga
Province **	Ontario
Postal Code **	L5N 2L8
Country *	Canada

Certifying Official

Given Name *	Meagan
Family Name *	Marcyniuk
Email Address	mmarcyniuk@dohertyengineering.ca
Fax	8553343645
Telephone Number *	4162003225

Mailing Address

Delivery Mode	
PO Box	

Rural Route Number	
Address Line 1 **	102 - 6780 Campobello Road
City **	Mississauga
Province **	Ontario
Postal Code **	L5N 2L8
Country *	Canada

General Stationary Combustion

Emissions from fuel combustion

Fuel and emissions *

Natural Gas

Please use the scroll bar or click and drag the bottom right corner of the input screen to view its entire contents.

Fuel *	Natural Gas
Fuel Classification	Non-Biomass
Units	Sm^3
Annual Amount Consumed *	21015451
Annual Weighted Average Carbon Content (tonnes of carbon per fuel base unit)	
Annual Weighted Average High Heating Value (GJ/unit fuel)	0.038
Energy input from combustion of fuel (GJ)	

GHG	N/A	Methodology **	Emissions (t) **	Emissions (t CO2e)
CO2	☐	ON.23(c)_HHV (2015+)	39154.73	39154.73
CH4	☐	ON.24(d)_HHV (2015+)	0.7714	16.1994

N2O	☐	ON.24(d)_HHV (2015+)	0.7291	226.0210

Summation of CO2 emissions for this sub-activity type

CO2 from biomass

0

Annual emissions from the use of sorbent

GHG	N/A	Methodology **	Emissions (t) **	Emissions (t CO2e)
CO2	☒			0

Production Data

Annual amount of steam generated from all units that burn biomass fuels or municipal solid waste (kg) **

0

Total Energy Input from the combustion of all non-biomass fuels (GJ)

801619

Total energy input from the combustion of all biomass fuels (GJ)

Hot rolled steel (t)

Useful thermal energy sold (GJ)

Pulp products (air dried tonnes)

Paper products (air dried tonnes)

Beer (100L)

Coal tar feedstock processed (t)

Coated recycled boxboard (t)

Fuel ethanol (Litres of absolute alcohol)

Gypsum panels (1000sf)

Industrial ethanol (Litres of absolute alcohol)

LDC Tissue Products (t)

Mineral Wool (t)

Polyethylene products (t)

Raw sugar processed (t)

TAD Tissue Products (t)

Used oil feed (kL)

(e) Attestation

File Name	Date
19014 - UofG 2018 Attestation Signed.pdf	27/05/2019 1:30:19 PM

Site Specific Emission Factors

Empty

De Minimis Emissions

De minimis emissions quantified using methods other than the quantification methodologies set out in the Guidelines for Greenhouse Gas Emissions Reporting.

Emissions

Activity *	GHG *	Emissions (t) *	Emissions (t CO2e)
General Stationary Combustion	CO2	212.7516	212.7516
General Stationary Combustion	CH4	0.002031	0.042651
General Stationary Combustion	N2O	0.002422	0.750820

Total De Minimis Emissions by activity (t CO2e)

Source	Emissions (t CO2e)
General Stationary Combustion	213.545071

Total De Minimis Emissions from all activities (t CO2e)

213.545071

CO2 Captured

CO2 captured (including used, transferred or stored)

GHG	N/A	Emissions (t) **	Emissions (t CO2e)
CO2	☒		0

Provide explanation on how the estimated total was determined and how the carbon dioxide may have been used, transferred or stored

Emissions Summary

GHG totals are calculated automatically. Note that the De Minimis values will be checked to ensure they do not exceed the reporting threshold when you click Validate.

Total GHG Emissions, by gas

Summary of reported emissions, by Activity

General Stationary Combustion

SQM / BAQM

CAS Number	GHG	Emissions (t)	Emissions (t CO2e)
124-38-9	CO2	39154.73	39154.73
74-82-8	CH4	0.7714	16.1994
10024-97-2	N2O	0.7291	226.0210

De Minimis

CAS Number	GHG	Emissions (t)	Emissions (t CO2e)
124-38-9	CO2	212.7516	212.7516
74-82-8	CH4	0.002031	0.0427
10024-97-2	N2O	0.002422	0.7508

Summary of reported emissions, by GHG

CAS Number	GHG	Emissions (t)	Emissions (t CO2e)
124-38-9	CO2	39367.4816	39367.4816
124-38-9	CO2 from biomass	0	0
74-82-8	CH4	0.773431	16.2421
10024-97-2	N2O	0.731522	226.7718
7783-54-2	Nitrogen Trifluoride (NF3)	0	0
2551-62-4	SF6	0	0
	HFCs		0

	PFCs		0

Total GHG Emissions

	Total
Total CO2e from all Activities, rounded up to the nearest tonne	39611
Total CO2e De Minimis from all Activities	213.545071
Percentage of emissions reported as De Minimis	0.5
Total CO2 Captured	0
Total CO2e excluding CO2 captured and CO2 from biomass	39610.495471
Reporting Amount	39611
Total CO2e excluding CO2 from biomass	39610.495471
Verification Amount	39611
Total CO2e from Mobile Equipment Operation	0

Note on Reporting to Environment Canada

If you also have an obligation to report greenhouse gas emissions to Environment Canada (EC) for this facility, you will be able to preload applicable data where possible from this report into an EC report.This Ontario report must be successfully submitted first in order to use the data prepopulation feature when filling out your EC report for the same facility.In your EC report, please ensure that you review and modify, where appropriate, the preloaded information to ensure it meets your reporting obligation to EC.Please note that De Minimis emissions will not be preloaded and must be manually entered into your EC report.

Comments

This section is optional

Enter any comments you wish to include related to the information you have reported.
Comments provided are not published.

You may provide additional comments related to the reported GHG emissions data to better explain your information. (e.g. justification of any large changes in emissions from the previous year.)
Enter your website if you wish to provide more information. (e.g. contextual information on environmental activities, etc.)

Website

Comments: (max 4000 characters)

If your comments exceed 4000 characters you may upload a document.

File Name	Date

Report Submission and Electronic Certification

Electronic Statement of Certification

Only the person identified as the Certifying Official or the authorized delegate should submit the report(s) identified below.

Reporting Period

2018

Activities List

General Stationary Combustion

Reporting Amount (t CO2e)

39611

Verification Amount (t CO2e)

39611

Company Name

University of Guelph

Company Address

50 Stone Road East, Guelph (Ontario)

Name

Guelph Campus

Address

50 Stone Road, Guelph (Ontario)

ON GHG ID

1151

Certifying Official

Meagan Marcyniuk

Person Submitting the Report

Meagan Marcyniuk

Note: If there is a change in the contact information, a change in the owner or operator, or if information submitted for any previous year was mistaken or inaccurate, please update this information through Single Window Information Manager (SWIM) or by contacting the GHG Emissions Reporting Program.

Submission Confirmation

Report submitted successfully. You may wish to print this page for your records.

Submited By

Meagan Marcyniuk

Timestamp

27/05/2019 2:41:08 PM