



Greenhouse Gas Protocol (Dual Reporting) Report for John Abbott College

Assessment Period: July 2019 - June 2020

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Assessment Details

Consolidation Approach

Operational Control

Organisational Boundaries

Operations of John Abbott College

Included

- John Abbott College
- John Abbott College

Operational Boundary

- Bus and coach
- Buses, whole vehicle
- Cars
- Composted waste
- Electricity
- Landfilled waste
- Motorcycle
- Natural gas
- On foot
- Other fuel(s)
- Rail (train, tram, light rail, underground)
- Recycled waste
- Refrigerant gas loss and other fugitive emissions
- Trucks

Quality Assurance Assessor

- Daniella Giardetti - daniella.giardetti@ecometrica.com

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Introduction

A greenhouse gas (GHG) emissions assessment quantifies the total greenhouse gases produced directly and indirectly from a business or organisation's activities. Also known as a carbon footprint, it is an essential tool, providing your business with a basis for understanding and managing its climate change impacts.

A GHG assessment quantifies all seven Kyoto greenhouse gases where applicable and is measured in units of carbon dioxide equivalence, or CO₂e¹. The seven Kyoto gases are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), nitrogen trifluoride (NF₃), sulphur hexafluoride (SF₆) and perfluorocarbons (PFCs). The global warming potential (GWP) of each gas is illustrated in the Table 1.

Table 1. GWP of Kyoto Gases (IPCC 2013, without climate-carbon feedback)

Greenhouse Gas	GWP
Carbon dioxide (CO ₂)	1
Methane (CH ₄)	28
Nitrous oxide (N ₂ O)	265
Hydrofluorocarbons (HFCs)	1 - 12,400
Perfluorocarbons (PFCs)	1 - 11,100
Nitrogen trifluoride (NF ₃)	16,100
Sulphur hexafluoride (SF ₆)	23,500

This assessment has been carried out in accordance with the World Business Council for Sustainable Development and World Resources Institute's (WBCSD/WRI) Greenhouse Gas Protocol; a Corporate Accounting and Reporting Standard, including the GHG Protocol Scope 2 Guidance. This protocol is considered current best practice for corporate or organisational greenhouse gas emissions reporting. GHG emissions have been reported by the three WBCSD/WRI Scopes.

Scope 1 includes direct GHG emissions from sources that are owned or controlled by the company such as natural gas combustion and company owned vehicles.

Scope 2 accounts for GHG emissions from the generation of purchased electricity, heat and steam generated off-site. As the subject of this assessment operates in markets which offer contractual instruments with product or supplier-specific data, scope 2 emissions are reported using both the location-based method and the market-based method. The location-based method applies average emission factors that correspond to the grid where consumption occurs, whereas the market-based method applies emission factors that correspond to energy purchased (or not purchased) through contractual instruments. Contractual instruments include energy attribute certificates, direct energy contracts, and supplier specific emission rates. The subject of this assessment has ensured that any contractual instruments used in the market-based method have met the Scope 2 Quality Criteria, as defined in the Guidance. Where contractual instruments do not meet the Quality Criteria, or where contractual instruments were not purchased, market-based scope 2 emissions have been calculated using residual mix emission factors. Where residual mix emission factors are not available, market-based scope 2 emissions have been calculated using default location grid-average emission factors, per the Protocol hierarchy. This may result in double counting between electricity consumers, as an adjusted emission factor taking into account voluntary purchases of electricity with specific attributes was not available.

Scope 3 includes all other indirect emissions such as waste disposal, business travel and staff commuting. Reporting of these activities is optional under the WBCSD/WRI GHG Protocol, but as they can contribute a significant portion of overall emissions Ecometrica recommends they are reported where applicable.

A GHG assessment is an essential tool in the process of monitoring and reducing an organisation's climate change impact as it allows reduction targets to be set and action plans formulated. GHG assessment results can also allow organisations to be transparent about their climate change impacts through reporting of GHG emissions to customers, shareholders, employees and other stakeholders. Regular assessments allow clients to track their progress in achieving reductions over time and provide evidence to support green claims in external marketing initiatives such as product labelling or CSR reporting. Ecometrica GHG assessments are designed to be transparent, consistent and repeatable over time.

¹ Carbon dioxide equivalent or CO₂e is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO₂e signifies the amount of CO₂ which would have the equivalent global warming impact.

Data Quality and Availability

In order to provide the most accurate estimate of an organisation's GHG emissions, primary (actual) data should be used where it is available, up to date and geographically relevant. Secondary data in the form of estimates, extrapolations and industry averages may be used when primary data is not available. Table 2 details the quality of data submitted for this assessment with the key assumptions used stated below.

Data Quality Overview



Location-based Accuracy Overview		
	tCO ₂ e/year	%
Actual	150	2.3
Estimated	6,359	97.7
Total	6,509	100



Market-based Accuracy Overview		
	tCO ₂ e/year	%
Actual	150	2.3
Estimated	6,359	97.7
Total	6,509	100

Table 2. Data Quality and Availability

Source of emissions	Data quality
Premises	
Composted waste	Estimated
Electricity	Actual
Landfilled waste	Estimated
Natural gas	Estimated
Off-road vehicles and equipment	N/A
Other fuel(s)	Estimated
Recycled waste	Estimated
Refrigerant gas loss and other fugitive emissions	Actual
Water supply	N/A
Water treatment	N/A
Company owned vehicles	
Buses, whole vehicle	Actual
Cars	Actual
Trucks	Estimated
Vans	N/A
Business Travel	

Air travel	N/A
Bus and coach	N/A
Buses, whole vehicle	N/A
Employee owned cars	N/A
Hired cars	N/A
Hotel night stays	N/A
Rail (train, tram, light rail, underground)	N/A
Taxi	N/A
Third Party Vehicle Use	
Road freight, shared vehicle (tonne.km factors)	N/A
Road freight, whole vehicle (km factors)	N/A
Commuting	
Bicycle	N/A
Bus and coach	Estimated
Cars	Estimated
Motorcycle	Estimated
On foot	Estimated
Rail (train, tram, light rail, underground)	Estimated
Catering - staff commuting	
Bicycle	N/A
Bus and coach	N/A
Cars	N/A
Motorcycle	N/A
On foot	N/A
Rail (train, tram, light rail, underground)	N/A
Catering - food delivery	
Trucks	N/A
Vans	N/A
Catering - waste	
Composted waste	N/A
Landfilled waste	N/A
Recycled waste	N/A

Key Assumptions

General

- This report pertains to real data for John Abbott College which has been impacted by the COVID-19 pandemic.
- All emissions were calculated using the Ecometrica Sustainability platform, a software which automatically selects the most geographically and temporally appropriate emission factors and non-standard conversions (e.g. fuel efficiency, heat content) for each emission source. Each of the emission factors and non-standard conversions is associated with a level of uncertainty, assigned by the tool based on its associated level of scientific certainty.
- Ecometrica did not review raw data or internal data collection systems. All data provided is assumed to be accurate and complete.

Premises

Diesel consumption for their generator was estimated using an average 'liters per day' assumption based on the time between their last refill (August 1, 2017) and their recent refill (June 25, 2020). The recent refill number will be used to calculate an updated litres/day assumption when they refill in the future.

Quantity of waste was estimated based on the volume of container, percentage of volume filled, and weekly pickup schedule. These estimates varied depending on the time of year (summer versus winter and fall). These estimates were adjusted pre- and post-covid.

Company-owned vehicles

- All gasoline consumption appears in the Company-owned vehicles section including gasoline consumption for off-road vehicles and equipment.
- For truck gasoline consumption, one data point was estimated based on a per litre dollar assumption derived from the relevant gas station receipt.

Commuting

- Commuting answers were based on the percentage of survey respondents that had seasonal or consistent modes of transport. These ratios were applied to the total populations for three categories: Day Students, Employees, and Continuing Education Students. Seasonal or consistent kilometres were applied for July to October, and April to June. Consistent kilometres were applied for the whole population for November to March. For seasonal secondary modes of transport, consistent kilometres were also applied for July to October. '2nd mode of transport' was assumed to be in average gasoline cars.
- Distances commuted by Bicycle were included in the On Foot total as there was no distinction made between these two categories in the survey.

Business Travel, Third Party Vehicle Use, Catering - staff commuting, and Catering - food delivery

- These sections have been excluded due to lack of available data for this assessment.

Assessment Summary for John Abbott College

Gross Overall Emissions (location-based): 6,509 tCO₂e

Gross Overall Emissions (market-based): 6,509 tCO₂e

Key Performance Indicators

Absolute GHG emissions will vary over time and often correspond to the expansion or contraction of an organisation. It is useful therefore to use reporting metrics that take these effects into account and monitor relative GHG emissions intensity. A common emissions intensity metric is tonnes of CO₂e per full time equivalent. This has been calculated, along with other relevant metrics, in the table below:

Data	KPI
66,902 Floor area (square metres)	0.0973 tCO ₂ e per square metre (Location-Based)
660 Full Time Equivalent Employees	9.86 tCO ₂ e per Full Time Equivalent Employee (Location-Based)
7,942 Number of students	0.82 tCO ₂ e per student (Location-Based)
66,902 Floor area (square metres)	0.0973 tCO ₂ e per square metre (Market-Based)
660 Full Time Equivalent Employees	9.86 tCO ₂ e per Full Time Equivalent Employee (Market-Based)
7,942 Number of students	0.82 tCO ₂ e per student (Market-Based)

Summary by Activity (Location-Based, tCO₂e)



By Activity	tCO ₂ e/year	%
Premises	1,447	22.2
Company owned vehicles	18.4	0.283
Commuting	5,043	77.5
Total	6,509	100

Summary by Activity (Market-Based, tCO₂e)



By Activity	tCO ₂ e/year	%
Premises	1,447	22.2
Company owned vehicles	18.4	0.283
Commuting	5,043	77.5
Total	6,509	100

Summary by WBCSD/WRI Scope (Location-Based, tCO₂e)



Scope	tCO ₂ e/year	%
Scope 1	1,305	20
Scope 2	12.9	0.198
Scope 3	5,191	79.8
Total	6,509	100

Summary by WBCSD/WRI Scope (Market-Based, tCO₂e)



Scope	tCO ₂ e/year	%
Scope 1	1,305	20
Scope 2	12.9	0.198
Scope 3	5,191	79.8
Total	6,509	100

Summary by Greenhouse Gas

Greenhouse Gas	GWP	tGHG/year (Location-Based)	tCO ₂ e/year (Location-Based)	tGHG/year (Market-Based)	tCO ₂ e/year (Market-Based)
CO ₂	1	6,210	6,210	6,210	6,210
CH ₄	28	5.54	155	5.54	155
N ₂ O	265	0.0808	21.4	0.0808	21.4
Biogenic CH ₄	27	0.077	2.08	0.077	2.08
HFC-134a	1300	0.0748	97.3	0.0748	97.3
HFC-410a	1923.5	0.0118	22.7	0.0118	22.7
CO ₂ e	1	0	0	0	0
Total			6,509		6,509

Summary of Scope 2 Market-Based Method for John Abbott College

Energy Consumed and Emissions By Factor Type In Scope 2 Market-Based Method

Scope 2 Market-Based Energy



Scope 2 Market-Based Emissions



Emission Factor Type	Energy		Market-Based Emissions	
	MWh	%	tCO ₂ e	%
Client-supplied market-based instrument	0	0	0	0
Residual mix factors	0	0	0	0
Default location-based factors	10,764	100	12.9	100
Total	10,764	100	12.9	100

Detailed Results

Detailed Summary by WBCSD/WRI Scope

Location-Based methodology

Source of Emissions	tCO ₂ /yr	tCH ₄ /yr	tN ₂ O/yr	Total Emissions (tCO ₂ e/yr)	%
Scope 1 Total	1,178	0.0236	0.0224	1,305	20%
Company owned vehicles Total	18.2	8.01e-4	8.97e-4	18.4	0.283%
Buses, whole vehicle	13	5.34e-4	7.33e-4	13.2	0.203%
Cars	3.68	2.23e-4	3.51e-5	3.7	0.0568%
Trucks	1.49	4.4e-5	1.29e-4	1.53	0.0235%
Premises Total	1,160	0.0228	0.0215	1,286	19.8%
Natural gas	1,157	0.0227	0.0215	1,164	17.9%
Other fuel(s)	2.51	7.29e-5	2.06e-5	2.51	0.0386%
Refrigerant gas loss and other fugitive emissions	0	0	0	120	1.84%
Scope 2 Total	12.9	0	0	12.9	0.198%
Premises Total	12.9	0	0	12.9	0.198%
Electricity	12.9	0	0	12.9	0.198%
Scope 3 Total	5,019	5.52	0.0584	5,191	79.8%
Commuting Total	5,019	0.353	0.0527	5,043	77.5%
Bus and coach	418	0.0718	0.00729	422	6.48%
Cars	4,467	0.271	0.0427	4,485	68.9%
Cars: Electricity - transmission & distribution losses (MCR)	0.0121	0	0	0.0121	1.86e-4%
Motorcycle	5.14	0.00172	9.14e-5	5.21	0.0801%
On foot	0	0	0	0	0%
Rail (train, tram, light rail, underground)	130	0.00854	0.0026	131	2.01%
Premises Total	0	5.17	0.00577	148	2.28%
Composted waste	0	0	0.00577	3.61	0.0554%
Landfilled waste	0	5.17	0	145	2.22%
Recycled waste	0	0	0	0	0%
Total	6,210	5.54	0.0808	6,509	100%

Market-Based methodology

Source of Emissions	tCO ₂ /yr	tCH ₄ /yr	tN ₂ O/yr	Total Emissions (tCO ₂ e/yr)	%
Scope 1 Total	1,178	0.0236	0.0224	1,305	20%
Company owned vehicles Total	18.2	8.01e-4	8.97e-4	18.4	0.283%
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Landfilled waste	0	5.17	0	145	2.22%
Recycled waste	0	0	0	0	0%
Total	6,210	5.54	0.0808	6,509	100%

Summary by Company Unit

Location-Based methodology

Company Unit	tCO ₂ e/year	FTE	tCO ₂ e/FTE
John Abbott College	6,509	660	9.86
John Abbott College	6,509	-	-

Market-Based methodology

Company Unit	tCO₂e/year	FTE	tCO₂e/FTE
John Abbott College	6,509	660	9.86
John Abbott College	6,509	-	-

Annual Activity Data

Source of Emissions	Value	Unit
Commuting		
Bus and coach		
Local bus	10,479,352	pass.km
Cars		
Average battery electric car	1,062,737	km
Average gasoline cars	23,031,540	km
Average hybrid car	1,243,436	km
Motorcycle		
Motorbike	42,050	km
On foot		
On foot	1,291,296	km
Rail (train, tram, light rail, underground)		
Commuter rail	1,349,732	pass.km
Company owned vehicles		
Buses, whole vehicle		
Diesel Bus	4,854	l
Cars		
Average hybrid car	1,596	l
Trucks		
Gasoline medium and heavy duty truck	647	l
Premises		
Composted waste		
Composted waste (wet weight basis)	19,240	kg
Electricity		
Electricity consumption	10,764,000	kWh
Landfilled waste		
Waste, landfilled, MSW	3,085	yd3
Natural gas		
Natural gas consumption (gross CV)	613,360	m3
Other fuel(s)		
Diesel	935	l
Recycled waste		
Waste, recycled	142,005	l
Waste, recycled	2,584	yd3
Refrigerant gas loss and other fugitive emissions		
HFC-134a emissions	165	lb
R410a emissions	26	lb

Key Observations

Overall

- For the 2019/2020 assessment period, no valid market-based instruments have been applied to the Scope 2 energy consumption, moreover the location included in the scope of this assessment, Canada, has no valid electricity residual mix factor available. Therefore the location based factor has been applied to the electricity consumption to derive a result in line with the Scope 2 market-based methodology.

Location based methodology

- Overall emissions were 6506 tonnes of CO₂e.
- Cars accounts for the largest portion of emissions with 4489 tonnes of CO₂e, or 69% of the total emissions.
- Natural gas consumption accounts for the second largest portion of emissions with 1164 tonnes of CO₂e, or 18% of the total emissions.

Market based methodology

- Overall emissions were 6506 tonnes of CO₂e.
- Cars accounts for the largest portion of emissions with 4489 tonnes of CO₂e, or 69% of the total emissions.
- Natural gas consumption accounts for the second largest portion of emissions with 1164 tonnes of CO₂e, or 18% of the total emissions.

Primary and Secondary Data

- To provide the most accurate estimate of your organization's GHG emissions, primary (actual) data should be used where available.
- For this assessment period, actual data accounted for 2.3 % of emissions, while estimated data accounted for 97.7% of emissions.
- The following Scope 1 sources used estimated data: others fuel(s), trucks, and natural gas
- The following Scope 2 sources used estimated data: none
- Future improvements to data quality involve the collection of actual data of the above listed sources.

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