CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF JUNE 4, 2013

Item 18, Report No. 23, of the Committee of the Whole, which was adopted without amendment by the Council of the City of Vaughan on June 4, 2013.

18 GREENHOUSE GAS EMISSIONS REDUCTION – PROGRESS UPDATE

The Committee of the Whole recommends approval of the recommendation contained in the following report of the Commissioner of Strategic and Corporate Services, dated May 21, 2013:

Recommendation

The Commissioner of Strategic and Corporate Services in consultation with the Manager of Environmental Sustainability recommend:

1. That the City of Vaughan corporate and community greenhouse gas inventory be received for informational purposes; and

2. That the stages of emission reduction target setting and local action planning be initiated as per the Federation of Canadian Municipalities (FCM) Partners for Climate Protection (PCP) program which Council committed to in May 2011.

Contribution to Sustainability

This report is consistent with the priorities previously set by Council in the *Green Directions Vaughan*, Community Sustainability Environmental Master Plan:

- Goal 1, Objective 1.2: To reduce greenhouse gas emissions through actions such as working with the community to develop a local action plan.

The City of Vaughan is committed to reducing emissions that contribute to climate change and which adversely affect the local air quality. The PCP program is a five-milestone framework used to guide municipalities to reduce GHG emissions. Demonstrating leadership in climate change mitigation at a municipal level is vital as it raises the importance of this global environmental issue within the community.

Economic Impact

Work to date compiling the corporate and community greenhouse gas inventory has been completed using internal staff time. Existing staff within the Environmental Sustainability business unit utilized past experience compiling GHG inventories to complete this effort. Financial support has been secured through the 2013 budget cycle for consultant support to develop an action plan for reducing GHG emissions at the community and corporate level. It is anticipated that support from FCM's Green Municipal Fund will be in place to assist with the completion of milestones two and three involving target setting and action planning.

Communications Plan

A separate communications plan is not required at this time. Greenhouse gas reduction activities are currently tracked as part of the annual implementation updates for actions 1.2.3-1.2.5 of *Green Directions Vaughan*. As with previous implementation updates, Environmental Sustainability works with Corporate Communications to issue a News Release highlighting key updates including those related to GHG emission reductions. As we move forward with developing a local action plan for GHG emissions, Corporate Communications will be consulted as community outreach will be a key component. This is consistent with Goal 5 of Green Directions Vaughan "To be leaders in advocacy and education on sustainability issues" where "Vaughan is committed to sharing its successes with the community".

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Purpose

The purpose of this report is to provide an update on the progress of addressing the early milestones of the FCM Partners for Climate Protection (PCP) Program and seek approval to move forward with the next phases, target setting and local action planning.

Background - Analysis and Options

Canadian municipalities can greatly reduce greenhouse gas emissions that are harmful to the environment. Up to half of Canada's greenhouse gas (GHG) emissions are under the direct or indirect control or influence of municipal governments.

In May 2011, Council passed a resolution to commit to achieve the milestones set in the Partners for Climate Protection (PCP) five-milestone framework. The benefits of participating in the PCP program include improving energy tracking and management, identifying where environmental impact is originating and highlighting which areas of reduction will have the largest impact with the least effort.

PCP is the Canadian component of ICLEI-Local Government for Sustainability Cities for Climate Protection network, which involves more than 900 communities worldwide. Since the program's inception in 1998, 223 Canadian municipalities have joined PCP, making a public commitment to reduce emissions. These members cover all provinces and territories, and account for more than 80% of the Canadian population.

Greenhouse Gas Emission Inventory

The first milestone of the PCP program involves developing a baseline of emissions, which is required to accurately set targets, identify milestones and measure improvements. A greenhouse gas inventory brings together data on community and municipal energy use and solid waste generation in order to estimate greenhouse gas (GHG) emissions in a given year. The inventory consists of a community inventory including residential, institutional, commercial, industrial, transportation, and solid waste sectors as well as a corporate inventory including municipal facilities and operations, including buildings, street lighting, water and wastewater treatment, municipal fleet, and corporate and/or community solid waste. As PCP member, the City of Vaughan was able to use the methodology and emissions calculations support provided by the PCP Secretariat. Attachment 1 presents the City of Vaughan's community and corporate greenhouse gas emissions baseline inventory for 2006 and 2008, respectively.

When selecting the data used to prepare the inventories, a number of guiding principles were followed including compiling the inventories as accurately as possible to help inform subsequent PCP milestone phases, applying consistency throughout the inventorying process to enable comparability between inventory years, compiling inventories as cost effectively as possible and ensuring the Inventories are verifiable.

The accuracy of an emissions inventory is heavily dependent on the data inputs to calculate the emissions. In both the City of Vaughan community and corporate GHG inventories, real consumption data was utilized wherever possible. Census data helped to develop some of the community numbers. Only in a very limited number of occasions were activity estimates used to generate a component of the inventory.

Discussions with Building and Facilities occurred to make them aware of the importance of facility level energy data in establishing baseline emission levels. Work to execute initiatives within the PCP program will be linked to existing initiatives. For example, action planning on corporate GHG emissions will be strongly linked to requirements under O. Regulation 397/11 to develop facility level energy management plans. Facility energy audits which are expected to be completed at 28 Vaughan facilities in Q3/2013 will also be incorporated into action planning for corporate GHG emission reductions.

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Target Setting and Action Planning

Two subsequent phases of the PCP program are ready to be initiated aimed at setting an emissions reduction target and developing a local action plan.

An emissions reduction target is expressed as a percentage reduction below the quantity of emissions released in the baseline year. The emissions reduction target provides a goal against which to monitor progress. PCP has established typical reduction targets however it entirely up to the municipality to develop targets which are appropriate for their particular circumstances.

The local action plan is a strategic document that outlines how the municipality will achieve its greenhouse gas (GHG) emissions reduction target. It covers City operations and the community. Key components include seeking public input, and documenting expected results, actions and implementation strategies. Again, an effort should be made to link the local action plan to existing GHG reduction actions outlined in other documents such as the Official Plan or the Community Sustainability and Environmental Master Plan.

Relationship to Vaughan Vision 2020/Strategic Plan

This report is consistent with the objective to lead and promote environmental sustainability.

Green Directions Vaughan is a component of Vaughan Tomorrow - the City's comprehensive growth management program which is mandated by the City's strategic plan, *Vaughan Vision 2020*. It consists of four linked elements which identify and address the ongoing challenges and opportunities that will shape the future of the City of Vaughan.

Regional Implications

By identifying greenhouse gas emissions sources throughout the community, Vaughan will be able to cost effectively undertake initiatives to reduce GHG emissions from corporate and community sources. Resulting activities could include transportation demand management, energy demand management, reforestation initiatives and water conservation activities. These initiatives have potential to positively impact the economic, social and environment sustainability of the region.

Conclusion

Through a wide range of initiatives, the City of Vaughan has already demonstrated its commitment to sustainability. As recommended by Green Directions, Objective 1.1, the City of Vaughan aims *to reduce greenhouse gas emissions and move towards carbon neutrality for the City of Vaughan's facilities and infrastructure*. By committing to measure, reduce and report on emissions from corporate and community activities, the City of Vaughan will be able to demonstrate leadership in the community as a strong environmental steward. It is important for the City of Vaughan to continue to make progress addressing the issue of climate change emissions by completing the milestones defined by the PCP program.

Attachments

1. Greenhouse Gas Community and Corporate Inventory

Report prepared by:

Elizabeth Linley, Sustainability Coordinator, ext. 8426
Chris Wolnik, Manager of Environmental Sustainability, ext. 8633

(A copy of the attachments referred to in the foregoing have been forwarded to each Member of Council and a copy thereof is also on file in the office of the City Clerk.)

COMMITTEE OF THE WHOLE – MAY 21, 2013

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Recommendation

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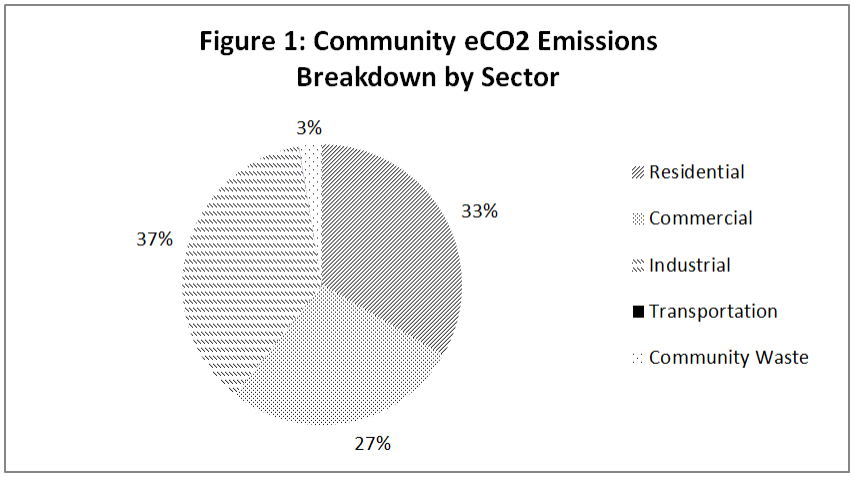
Respectfully submitted,

Joseph Pittari, MSc.
Commissioner, Strategic and Corporate Services

Community Inventory 2006

Summary

As part of the City of Vaughan's commitment to the Partners for Climate Protection (PCP) program, the City undertook a greenhouse gas audit to identify where its environmental impact was originating from within the community. The year 2006 was chosen as the baseline audit year as it was the earliest year that complete data was available. The Community PCP model looks at emissions from Residential, Commercial, Industrial, Transportation and Community Waste sources. In 2006, the City of Vaughan emitted 1,330,359 tonnes of eCO_2[1]. The industrial sector is the most significant contributor at 37%, with residential sector not far behind at 33%. These sectors produced 487,047 and 443,832 tonnes of eCO_2 respectively. The commercial sector accounted for 363,502 tonnes of eCO_2. These sectors combined for over 96% of eCO_2 in the city. Waste accounted for 3%, while transportation accounted for less than 0.5%. Figure 1 shows the eCO_2 emissions by sector.



[1] Carbon Dioxide Equivalent (eCO2)-a metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP)

Residential

In 2006, residential electricity use in the City of Vaughan was 688,360,970 kWh. Electricity use from this sector represents the total amount of kWh of electricity used by the 69,535 households in the City[2]. In 2006, City of Vaughan households used 160,815,238 cubic metres (m^3) of natural gas. Households include residential and apartment buildings as defined by Enbridge Gas. Table 1 provides a breakdown of fuel type and associated eCO_2 emissions used by residences in the city.

Table 1: Residential Electricity and Natural Gas Use

Fuel Type	Units	Total Use	Total eCO_2 (t)
Electricity	kWh	688,360,970	123,905
Natural Gas	m^3	160,815,238	319,927
Total		-	**443,832**

Sources: Enbridge Energy Inc.[3] and PowerStream Inc.[4]

Commercial

In 2006, commercial activity within the City of Vaughan used over 345 million kWh of electricity and 159 million m^3 of natural gas. This resulted in 363,502 tonnes of Greenhouse Gases (GHGs) being emitted into the atmosphere. The emission breakdown is summarized below in Table 2.

Table 2: Commercial Electricity and Natural Gas Use

Fuel Type	Units	Total Use	Total eCO_2 (t)
Electricity	kWh	345,100,707	62,118
Natural Gas	m^3	159,409,626	301,384
Total		**-**	**363,502**

Sources: Enbridge Energy Inc.[3] and PowerStream Inc[4]

Industrial

In 2006, industrial activity within the City of Vaughan emitted over 487,047 tonnes of GHG emissions. Emissions were the result of electricity and natural gas consumption. Table 3 outlines the electricity use and natural gas use for sector.

Table 3: Industrial Electricity and Natural Gas Use

Fuel Type	Units	Total Use	Total eCO_2 (t)
Electricity	kWh	2,022,169,428	363,990
Natural Gas	m^3	65,087,545	123,056
Total			**487,047**

Sources: Enbridge Energy Inc.[3] and PowerStream Inc.[4]

[2] City of Vaughan. Population and Employment- Growth Projection 2006-2031. Accessed May 8, 2013 from http://www.vaughan.ca/business/market_indicators/demographics/General%20Documents/Population%20and%20Employment%20Growth%20Projections%202006%20-%202031.pdf

[3] All natural gas consumption information provided by Enbridge Energy Inc.

[4] All electrical consumption information provided by PowerStream Inc.

Transportation

Transportation GHG emissions are calculated based on where a vehicle trip originates. For the City of Vaughan, transportation released 913 tonnes of GHG emissions. This number was estimated by the PCP quantification model based on the number of vehicle kilometres travelled (VKT) number. The VKT number was obtained from a *Transportation Tomorrow* survey conducted by the Civil Engineering Department at the University of Toronto. The estimate was calculated by multiplying the median number of trips made per person in the city by the length of those trips and then multiplying that total by the total number of drivers in the city.

Table 4 below provides the PCP model based breakdown on the city's total VKT. The breakdown by fuel type and vehicle type demonstrate that autos and light trucks, which use gasoline, produce the greatest amount of eCO_2 emissions.

Table 4: Emissions by Vehicle and Fuel type

Fuel Type	Autos	Light Truck	Heavy Truck	Bus	Total eCO_2 (t)
Gasoline	307	308	24	0	**639**
Diesel	1	8	258	0	**267**
Propane	7	0	0	0	**7**
Total	**315**	**316**	**282**	**0**	**913**

Waste

York Region is responsible for community garbage collection within the City of Vaughan and was unable to provide the City of Vaughan with 2006 waste production estimate. Using the Ontario per capita average of waste disposal for 2006[5] and multiplying it by Vaughan's population, the City estimated that the City of Vaughan produced 72,796 tonnes of garbage in 2006.

292kg (Ontario per capita residential garbage disposed) x 249,300 (population of Vaughan) = 72,796 tonnes of garbage. This created an eCO_2 value of 35,066[6].

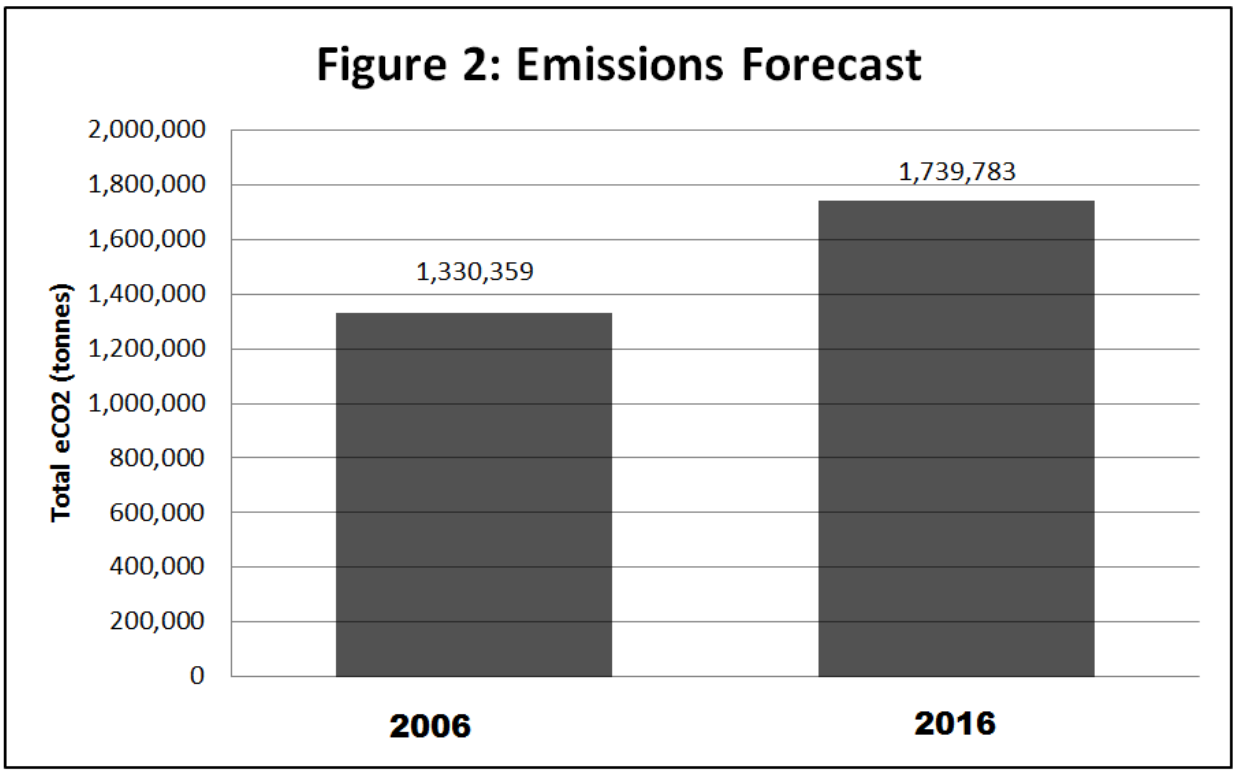
It is important to note the Ontario average per capita garbage figure only accounts for residential sources.

Emissions Forecast

As one of the fastest growing regions in Canada, Vaughan is expecting to see an increase in population, which will result in an increase in eCO_2 emissions. Between 2006 and 2016, population is expected to increase from 249,345 to 326,082. This is an increase of 31%. Figure 2 illustrates that such an increase would equate to an additional 312,634 tonnes of eCO_2.

[5] Statistics Canada. Waste Management Industry Survey: Business and Government sectors 2006. Accessed May 8, 2013 from http://www.statcan.gc.ca/pub/16f0023x/2006001/5212375-eng.htm

[6] FCM- PCP Program Milestone 1: Tools and Resources- Inventory Quantification Support Spreadsheet. Accessed May 8, 2013 from http://www.fcm.ca/Documents/tools/PCP/Inventory_Quantification_Support_Spreadsheet_EN.xls



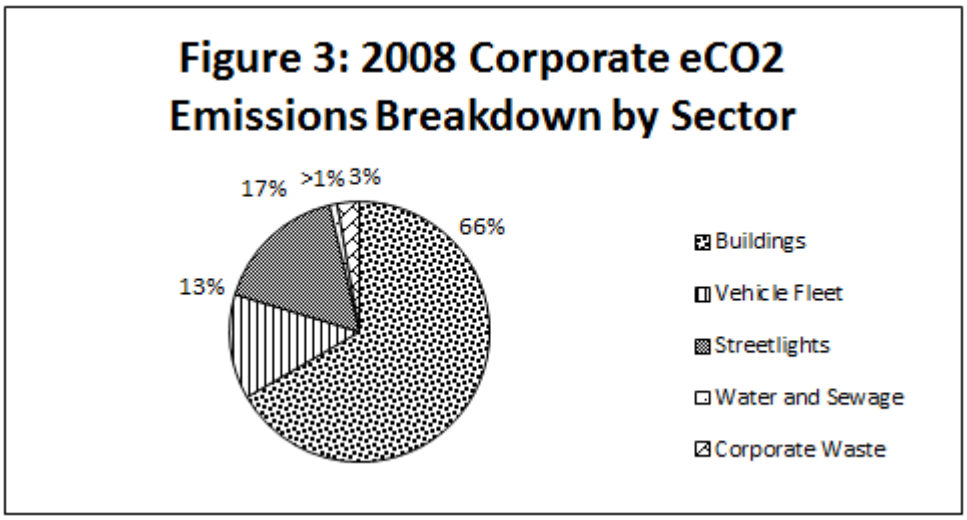
Corporate Greenhouse Gas Inventory 2008

Summary

As part of the City of Vaughan's commitment to The Partners for Climate Protection (PCP) program, the City undertook a greenhouse gas audit to identify where its environmental impact was originating as a result of its corporate operations. The Corporate PCP model looks at emissions from buildings, vehicle fleets, streetlights, water and sewage, and waste produced. The calendar year of 2008 was chosen as the corporate audit year as it was the last year that complete data could be compiled for. In 2008, the City of Vaughan emitted 13,956 tonnes of greenhouse gas or equivalent carbon dioxide coefficient (eCO_2). The breakdown of emission sources are broken down by sector in Table 5: Energy Costs and eCO_2[2] Emissions by Sector 2008.

Table 5: Energy Costs and eCO^2 Emissions by Sector 2008			
Sector	**Total Cost ($)**	**Energy (GJ)**	**Total eCO_2 (t)**
Buildings	2,401,843	158,551	9,311
Vehicle Fleet	749,349	460,671	1,819
Streetlights	1,405,317	49,251	2,326
Water and Sewage	276,419	1,334	135
Corporate Waste	-	-	383
Total	**4,832,929**	**669,807**	**13,974**

Figure 3 depicts 2008 Corporate Emissions by Sector as a percentage of the total emissions that were emitted by the operations of the City of Vaughan.



The City of Vaughan's 2008 corporate emissions per resident served are relatively similar to other York Region municipalities. The City of Markham and the Town of Richmond Hill have both submitted to the PCP program their corporate GHG inventories. Markham and Richmond Hill reported to the PCP program corporate emissions of 15,100 tonnes of eCO_2 and 8,795 tonnes of eCO_2 in 2006 and 2009 respectively[7]. Table 6 outlines how the City of Vaughan compares to other York Region Municipalities.

Table 6: Vaughan in Comparison to Other York Region Municipalities

Municipality	Baseline Year	Corporate Emissions	Population for Baseline Year	Corporate GHG Emissions per 1000 Residents (eCO_2)
City of Vaughan	2008	13,956	267,300	52.21
City of Markham	2006	15,100	261,573	57.73
Town of Richmond Hill	2009	8,795	185,000	47.54

Buildings:

In 2008, the City of Vaughan owned 51 buildings in total which included the Civic Centre, the Joint Operations Centre, 9 Fire Halls and 8 community centres[8]. The emissions that the GHG Corporate Inventory captures from corporate buildings are calculated based on electricity consumption and natural gas consumption. City of Vaughan buildings emitted 9,311 tonnes of eCO_2 in 2008. The emission coefficients were based on the PCP program recommended 2008 emission coefficients. The electricity costs at Rosemount/Benjamin Vaughan are shared with York Region District School Board. Vaughan

[7] Town of Markham: Greenhouse Gas Emissions Inventory and Local Action Plan for Emissions Reductions, March 2009. Accessed May 8, 2013 from http://www.fcm.ca/Documents/reports/PCP/Town_of_Markham_Greenhouse_Gas_Emissions_Inventory_And_Local_Action_Plan_For_Emissions_Reductions_2009_EN.pdf :
"Town of Richmond Hill. Clean Air Local Action Plan Achieving Milestone Five. February 2011. Accessed Many 8, 2013 from http://www.fcm.ca/Documents/reports/PCP/Richmond_Hill_emission_reduction_action_plan_EN.pdf

[8] Electrical Consumption data was not available Vaughan Grove. As a result, the GHG footprints from this building were omitted from all GHG calculations.

pays 50.8% of the bill and as a result, is only responsible for 50.8% of the emissions that result from electricity use at this facility. The GHG accounting of emissions for Rosemount/ Benjamin Vaughan reflects this agreement. Table 7 provides a breakdown of emissions that resulted from each building that is a part of the City of Vaughan corporate emissions profile.

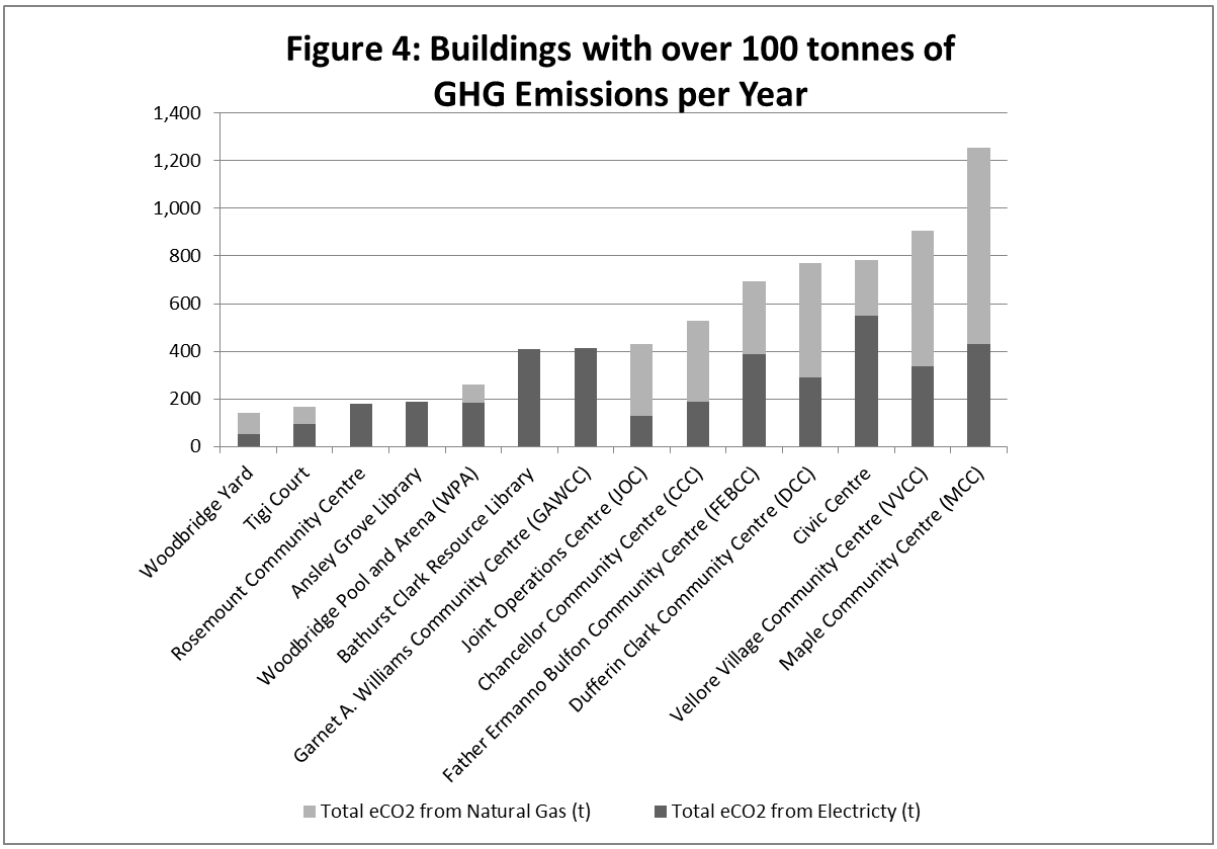
Table 7: Emissions Breakdown by Building

Building or Building Group Name	Total eCO_2 from Electricity (t)	Total eCO_2 from Natural Gas (t)	Total eCO_2 (t)
Al Palladini Community Centre (APCC)	559	704	1,263
Maple Community Centre (MCC)	432	820	1,252
Vellore Village Community Centre (VVCC)	338	566	904
Civic Centre	551	233	784
Dufferin Clark Community Centre (DCC)	288	481	769
Father Ermanno Bulfon Community Centre (FEBCC)	386	309	695
Chancellor Community Centre (CCC)	188	340	528
Joint Operations Centre (JOC)	129	302	430
Garnet A. Williams Community Centre (GAWCC)	412	0	412
Bathurst Clark Resource Library	407	0	407
Woodbridge Pool and Arena (WPA)	185	75	260
Ansley Grove Library	188	0	188
Rosemount Community Centre	178	0	178
Tigi Court	95	70	166
Woodbridge Yard	54	88	142
Fire Station 7-9	18	68	86
MNR Buildings	83	0	83
Fire Station 7-1	18	65	82
Fire Station 7-6	22	37	59
Fire Station 7-3	12	46	57
Concord Community Hall	0	48	48
Fire Station 7-8	24	22	46
Woodbridge Library	44	0	44
Vellore Hall	18	19	37
8090 Dufferin St	0	33	33
Gallanough Building	15	14	29
OLD Library	13	15	28
Thornhill Outdoor Pool (TOP)	21	6	27
Glen Shields Activity Centre (GSAC)	26	0	26
Fire Station 7-2	25	0	25
Beaverbrook House	6	14	20
Historical Cultural Centre	18	0	18
Pine York Storefront Seniors	2	15	17
Vaughan Grove	0	17	17

Sonoma Centre (Seniors)	4	12	16
Fire Station 7-4	4	10	15
Fire Station 7-7	13	0	13
Kleinburg Scout House	2	11	12
Kleinburg Library	12	0	12
MacDonald House	12	0	12
Fire Station 7-5	10	0	10
Father Bulfon Outdoor Rink	0	10	10
Arnold House	0	9	9
Charlton House	0	7	7
Armstrong House	0	7	7
Piazza House (Hospice Vaughan)	0	7	7
Tennis Building	0	6	6
Baker Homestead	0	6	6
Wallace House	0	6	6
Concord Older Adult Club	0	4	4
Woodbridge CS	0	0	0
Total	**4,811**	**4,501**	**9,312**

Source: PowerStream and Enbridge Inc. All emission estimates were made using the FCM- PCP Program Milestone 1: Tools and Resources- Inventory Quantification Support Spreadsheet.

Vaughan has 36 buildings that emit less than 100 tonnes of GHG equivalent emissions per year and account for 933 tonnes of GHG emissions per year. The City has 15 buildings that produce more than 100 tonnes of GHG equivalent emissions per year. These 15 buildings account for 8,379 tonnes of GHG emissions per year. The breakdown of Vaughan's building stock is detailed in Figure 4.

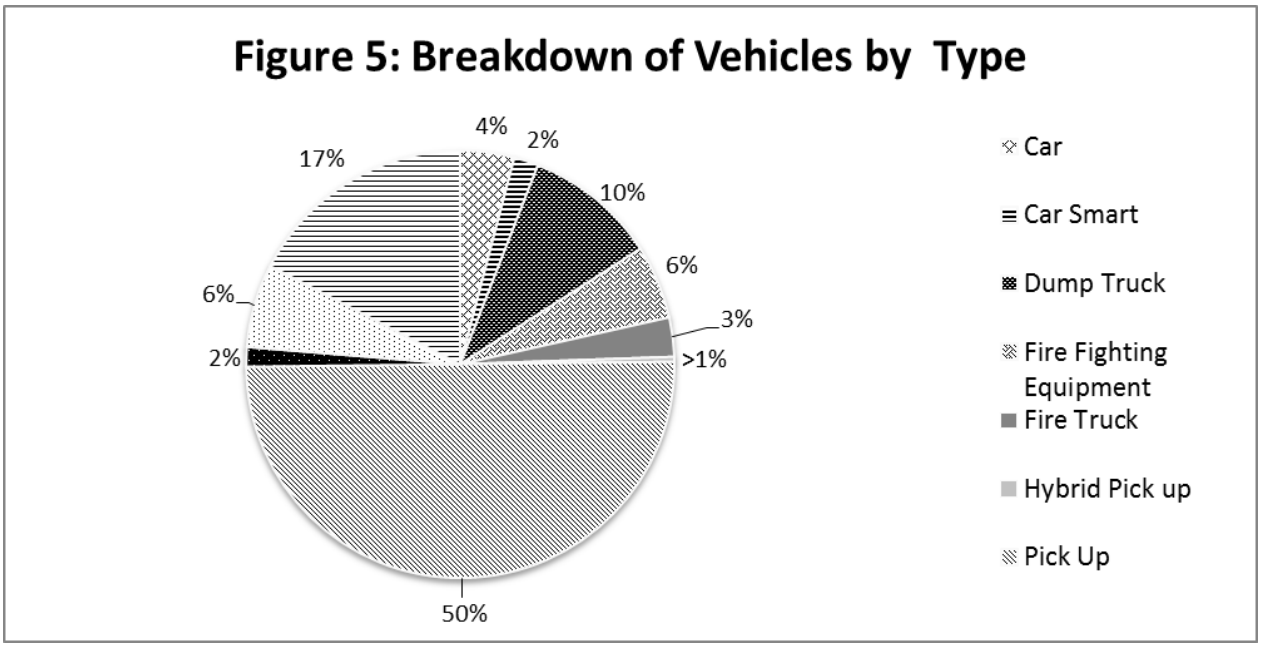


Vehicles:

In 2008, the City of Vaughan owned and operated 270 vehicles. The City provides vehicles to a wide range of City Departments, including the Building and Facilities Department, By-Law Enforcement, Fire Department and the Parks and Recreation Department. Table 8 provides a breakdown of the number of vehicles per department. The City of Vaughan vehicle fleet is comprised of Cars, Smart Cars, Dump Trucks, Fire Fighting Equipment, Fire Trucks, a Hybrid Pickup Truck, Street Washers, SUVs and Vans. The majority of the vehicles owned by the City are pickup trucks. Of the 136 pickup trucks owned by the City, there is 1 hybrid pickup truck. A breakdown of the City of Vaughan's vehicle fleet by department is illustrated in Figure 5:

Table 8: Fleet breakdown by City Department	
Building	8
Building and Facilities	15
Bylaw	20
Emergency Management	1
Engineering Services	12
Engineering Transportation	1
Finance	2
Fire	48
Fleet	23

Forestry	7
Information Technology Services	1
Licensing	1
Mayor/City Manager/Commissioner's	6
Parks	64
Public Works (Roads, Sewer, Water, Waste)	58
Purchasing	1
Record Management	1
Recreation	1
Total	**270**



In 2008, the City of Vaughan spent $749, 349[9] on fuel and the vehicle fleet travelled 2,567,132[10] kilometres within Vaughan. This resulted in 1,819 tonnes of eCO_2 being emitted from the City of Vaughan corporate fleet. Table 9 and 10 outline the breakdown of the vehicle fleet and vehicle fleet averages:

Table 9: Breakdown of Vehicle Fleet

Vehicle Type	Number of Vehicles	Total Cost ($)	Total eCO_2 (t)	Vehicle Kilometers	Total eCO_2 (t)/km
Car	11	$19,098.82	39	111,373	0.17
Car Smart	5	$102,254.15	7	40,476	2.53
Dump Truck	27	$33,583.41	264	201,922	0.17
Fire Fighting Equipment	15	$30,791.76	84	No information available	No information available

[9] Cost information was not available for SUV vehicles or Fire Trucks.
[10] Kilometers travelled information was not available for Fire Fighting Equipment or Fire Trucks.

Fire Truck	8	No information available	77	No information available	No information available
Hybrid Pick up	1	$1,880.70	5	9,052	0.21
Pick Up	135	$386,394.12	876	1,472,052	0.26
Street Washer	4	$51,837.76	39	23,208	2.23
SUV	17	No information available	134	177,645	No information available
Van	47	$123,508.72	295	531,404	0.23
Total	**270**	**$749,349.43**	**1,819**	**2,567,132**	**NA**

Table 10: Vehicle Fleet Averages

Vehicle Type	Average kms driven/ Vehicle	Average Cost/ Vehicle	Average eCO_2/ Vehicle
Car	10,125	$1,736.26	3.55
Car Smart	8,095	$20,450.83	1.40
Dump Truck	7,479	$1,243.83	9.78
Fire Fighting Equipment	No information available	$2,052.78	5.60
Fire Truck	No information available	No information available	9.63
Hybrid Pick up	9,052	$1,880.70	5.00
Pick Up	10,904	$2,862.18	6.49
Street Washer	5,802	$12,959.44	9.75
SUV	10,450	$0.00	7.88
Van	11,306	$2,627.85	6.28
Fleet Average	**9,152**	**$5,090.43**	**6.53**

Streetlights:

The City of Vaughan has two classifications for streetlights, one is General Streetlights and the other is Traffic Streetlights. A breakdown of the electricity consumption, cost and eCO_2 emissions for 2008 are broken down in Table 11:

Table 11: 2008 Streetlights

Streetlight Group Name	Electricity Use (kWh)	Total Cost ($)	Total e eCO_2 (t)
General Streetlights Total	12,962,214	1,327,384	2204
Traffic Light Total	718,491	77,934	122

Waste:

It is estimated that in 2008, the City of Vaughan corporate facilities produced 795.83 tonnes of garbage that was sent to landfill. The emission coefficients provided by the PCP program estimates that 795.83 tonnes of garbage would produce 383.35 tonnes of eCO_2 emissions. The 2008 waste production data was not available. The 2008 waste production estimate was based on waste production for 2011. The City of Vaughan Building and Facilities Department provided the waste production records for 2011. It was assumed that, the City had more facilities in 2011 than in 2008, but the City also had a more impactful waste diversion strategy in place. The overall waste production between 2008 and 2011 were estimated to be equivalent.

Water and Sewage:

The City of Vaughan operates an extensive pumping and waste water system throughout the City. The City is responsible for providing water services at the following establishments. The City emitted 135 t of eCO_2 emissions as a result of providing water and sewage services to corporate operations. Table 12 outlines the City of Vaughan's eCO_2 emissions from Pumping and Wastewater Facilities. Table 13 outlines the City of Vaughan's eCO_2 emissions from water use at City owned facilities.

Table 12: Pumping and Wastewater Facilities

Facility/Facility Group Name	Electricity (kWh)	Total Cost ($)	Total eCO_2 (t)
Block 12 Pumping Station-Wastewater	39,027	$8,833	7
Kerwood Pumping Station –Wastewater	14,550	$1,694	2
Maplewood Pumping Station-Wastewater	71,460	$7,265	12
Nashville - Hwy 27 Pumping Station-Wastewater	31,109	$3,324	5
North Maple Water Booster Station	187,740	$21,993	32
Northdale Pumping Station-Wastewater	15,240	$1,781	3
Pine Grove Pumping Station-Wastewater	22,691	$2,401	4
Sevilla Pumping Station- Wastewater	21,000	$2,640	4
Teston Water Booster Station	167,580	$16,757	28
Total	**570,397**	**$66,688**	**97**

Table 13: Facility Water Utilities

Facility/Facility Group Name	Electricity (kWh)	Total Cost ($)	Total eCO_2 (t)
Al Palladini Community Centre (APCC)	76,710	$137,598	13
Ansley Grove Library	7,071	$11,531	1
Beaverbrook House	80	$220	>1
Chancellor Community Centre (CCC)	7,071	$6,402	1
Dufferin Clark Community Centre (DCC)	27,789	$49,413	5
Father Ermanno Bulfon Community Centre (FEBCC)	1,921	$3,583	>1
Fire Station 7-1	1,100	$1,975	>1

Fire Station 7-2	1,244	$2,209	>1
Fire Station 7-3	464	$822	>1
Fire Station 7-4	60	$110	>1
Fire Station 7-5	680	$1,209	>1
Fire Station 7-6	651	$1,175	>1
Fire Station 7-7	493	$876	>1
Fire Station 7-8	1,559	$2,780	>1
Fire Station 7-9	1,002	$1,726	>1
Gallanough Building	587	$1,040	>1
Glen Shields Activity Centre (GSAC)	977	$1,855	>1
Kleinburg Library	81	$129	>1
MacDonald House	176	$408	>1
OLD Library	403	$711	>1
Thornhill Outdoor Pool (TOP)	11,280	$20,532	2
Woodbridge Library	249	$440	>1
Woodbridge Pool and Arena (WPA)	3,500	$3,180	1
Works Yard	452	$409	>1
Vaughan Landfill Methane Station	75,600	$7,735	13
Total	**221,198**	**$258,065**	**38**

Note: Data is missing for the following accounts: Camlaren Cres. Pumping Station-Wastewater, Rosemount Community Centre (RCC), Yeshivah Pumping Station-Wastewater.

Forecast for Corporate Emissions:

As City of Vaughan corporate operations grow to accommodate an increasing population, the City expects corporate emission to rise accordingly. In 2008, the population in Vaughan was an estimated 267,300 residents. By 2018, the City of Vaughan will have an estimated 339,800 residents. A 27% increase in population will likely result in a comparable increase in corporate emissions. It is estimated that the corporate emissions for the City of Vaughan from 2018 will be 339,880 tonnes of eCO_2. Table 14 outlines how corporate emissions are expected to increase. Figure 6 provides a corporate emissions forecast by sector.

Table 14: Corporate GHG Emissions Forecast			
Corporate info	Year	Population Estimate	Total eCO_2 (t)
Base Year	2008	267,300	13,974
Forecast Year	2018	339,800	17,764

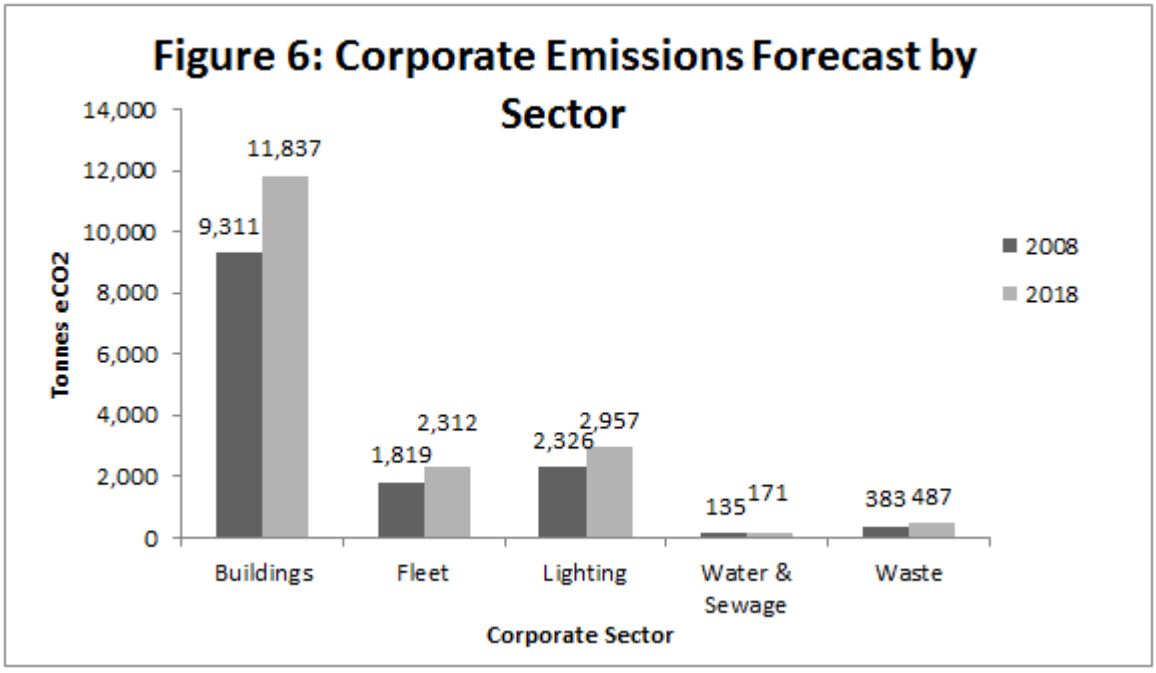


Figure 6: Corporate Emissions Forecast by Sector
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Tonnes eCO2
11,837
9,311
2,312
1,819
2,957
2,326
171
135
487
383
Buildings
Fleet
Lighting
Water & Sewage
Waste
Corporate Sector
2008
2018