ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN UPDATE 2019-2023

TOWN OF AURORA

June 3, 2019

AURORA

Prepared by WALTERFEDY

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EXECUTIVE SUMMARY

The Ontario Provincial Government has committed to help public agencies better understand and manage their energy consumption. As part of this commitment, Ontario Regulation 507/18 under the Electricity Act requires public agencies, including municipalities, municipal service boards, school boards, universities, colleges and hospitals to report on their energy consumption and greenhouse gas (GHG) emissions annually, to develop and implement an Energy Conservation and Demand Management (ECDM) Plan, and to update their ECDM Plan every five years.

The Town of Aurora is committed to developing and executing on strategies to reduce environmental impact, utility costs, and ensure regulatory compliance in accordance with Ontario Regulation 507/18.

Table 1 summarizes the energy consumption and GHG emissions for the Town of Aurora facilities and fleet for 2018. This is the baseline which the current goal will be based on.

Table 1: Town of Aurora 2018 energy consumption and GHG emissions summary

		Administrative Offices	Public Facilities	Indoor Recreation Facilities	Water/Waste Water Facilities	Fleet	Total
Electricity Consumption	[kWh]	1,299,380	1,220,316	6,761,361	118,358	-	9,399,415
Natural Gas Consumption	[m^3]	193,359	119,928	921,252	-	-	1,234,539
GHG Emissions	[mtCO2e]	421	279	2,030	5.1	491	3,226

Table 2 summarizes the energy consumption and GHG reduction goals that the Town of Aurora plans to meet by 2024.

Table 2: Town of Aurora 2023 goals summary

		Administrative Offices	Public Facilities	Indoor Recreation Facilities	Water/Waste Water Facilities	Fleet	Total
Electricity Consumption Reduction	[kWh]	173,937	313,257	503,769	-	-	990,963
Electricity Consumption Reduction	[%]	1.9	3.3	5.4	-	-	10.5
Natural Gas Consumption Reduction	[m^3]	2,589	26,894	90,101	-	-	119,584
Natural Gas Consumption Reduction	[%]	0.21	2.2	7.3	-	-	9.7
GHG Emissions Reduction	[mtCO2e]	12	64	192	-	245	514
GHG Emissions Reduction	[%]	0.38	2	5.9	-	7.6	15.9
Implementation Cost	[$]	143,800	77,407	407,635	-	-	628,842

*Reductions based on 2018 energy consumption and GHG emissions.
* Water/Waste water facilities contributed the least to energy consumption and GHG emissions of all Town of Aurora facilities (Table 1). As such, goals for energy consumpion and GHG emissions reductions were focused on other facilities.

The overall goal is to reduce electricity consumption by **10.5%** (990,963 kWh), natural gas consumption by **9.7%** (119,584 m^3), and GHG emissions by **15.9%** (514 mtCO2e) of the 2018 baseline by the end of 2023. This is expected to require an investment of approximately **$628,842**.

1 INTRODUCTION

This Energy Conservation & Demand Management (ECDM) plan was created in accordance with the requirements described in Ontario Regulation 507/18 under the Electricity Act. It provides a roadmap for energy management in the Town of Aurora for the next five years (2019 - 2023). The main objectives of this plan are:

- Examining historical energy consumption and GHG emissions, as well as energy conservation measures (ECMs) that have been implemented since the 2014 ECDM plan.
- Examining whether the goals of the 2014 ECDM plan have been met, and sets goals for the 2019 CDM plan to be met by 2024.
- Examining what ECMs are already planned for the future, as well as additional ECMs which should be completed from 2019 - 2023 in order for the Town of Aurora to meet the goals established within this plan.

All three objectives are vital and will come together to form a complete roadmap which will determine the priorities, technologies, projects, and opportunities required to achieve the Town of Aurora's corporate energy and GHG goals.

2 FACILITIES

2.1 Baseline

A list of the facilities included in this section are summarized in Table 3.

Table 3: Town of Aurora facilities list

Building	Category	Address	Year	Area [sqft]
Aurora Town Hall	Administrative offices	100 John West Way	1991	49,280
Joint Operations Centre (JOC)	Administrative offices	229 Industrial Parkway N	2016	63,152
Aurora Community Centre (ACC)	Indoor recreation facility	1 Community Centre Lane	1966, 1996	81,100
Aurora Family Leisure Complex (AFLC)	Indoor recreation facility	135 Industrial Parkway North	1985	61,000
Stronach Aurora Recreation Complex (SARC)	Indoor recreation facility	1400 Wellington Street East	2007	104,000
Armoury	Public facility	89 Mosley Street	1874	8,400
Aurora Cultural Centre	Public facility	22 Church Street	1885	17,500
Aurora Public Library	Public facility	15145 Yonge Street	2000	44,375
Aurora Seniors Centre	Public facility	90 John West Way	2005	13,934
McMahon Clubhouse	Public facility	76 Maple Street	1930, 1970	1,400
Victoria Hall	Public facility	27 Mosley Street	1883	900

2.1.1 Energy Consumption

Figure 1 summarizes the Town of Aurora's annual electricity and natural gas consumption from 2014 - 2018. Data from 2014 - 2018 was provided by the Town of Aurora.

It can be seen that the annual electricity consumption has an increasing trend from 2014 - 2016, but decreases slightly from 2016 onwards (mainly due to reduced electricity consumption in indoor recreation facilities). The annual natural gas consumption had a significant decrease from 2014 - 2015 but increases every year afterwards.

An increase in annual electricity consumption for administrative offices in 2016 can be seen due to the new Joint Operations Centre being newly operational. However, the building was not heated significantly until 2017 (as shown by the increase in annual natural gas consumption). There were no facilities added or removed otherwise.

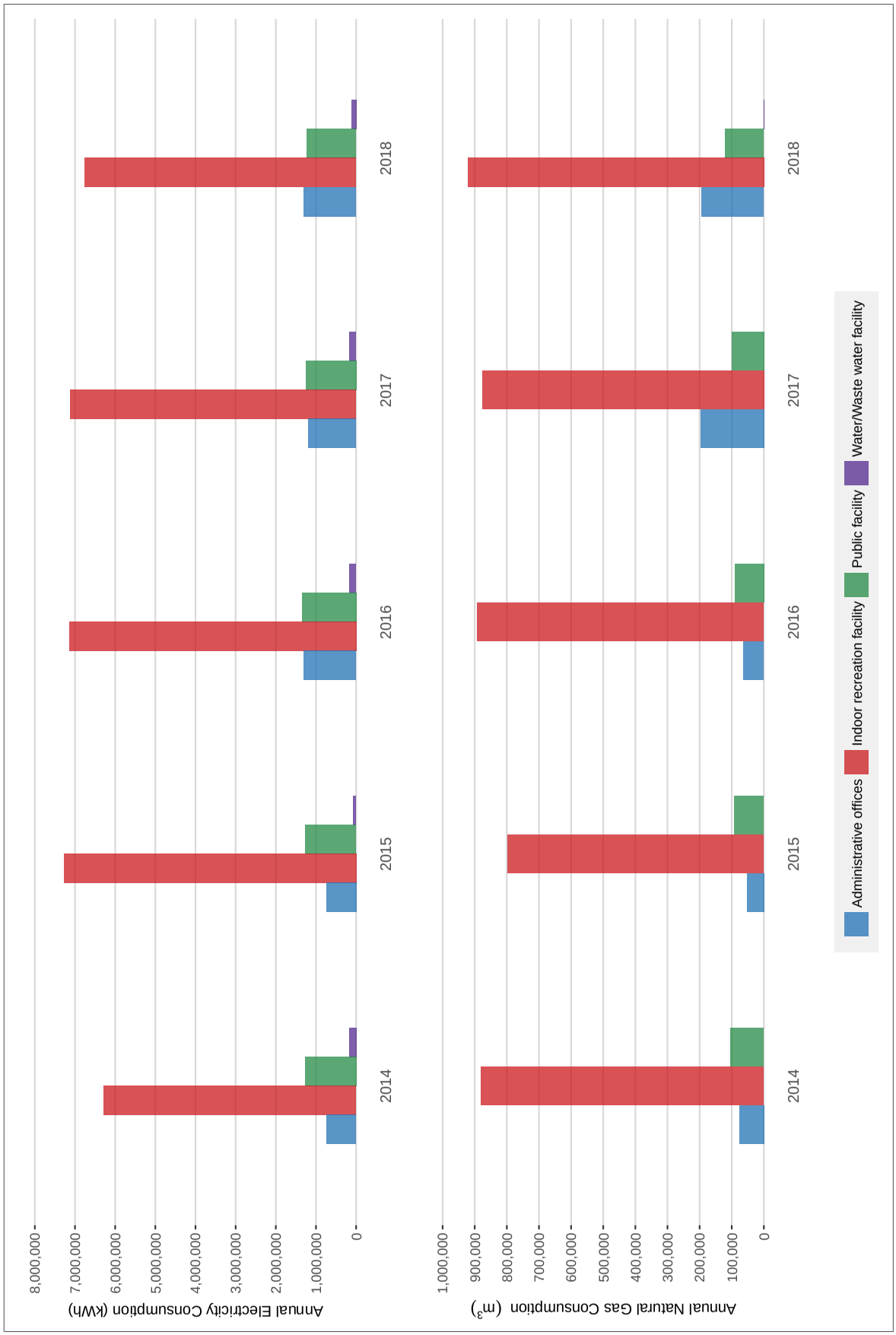


Figure 1: Annual electricity and natural gas consumption

2.1.2 GHG Emissions

GHG emissions is typically measured in metric tonnes of carbon dioxide (mtCO2e). To illustrate, a typical passenger vehicle emits approximately 4.6 mtCO2e per year. GHG emissions can be broken down into three categories - Scope 1, Scope 2, and Scope 3.

Scope 1 emissions are defined as direct emissions from sources owned or controlled by the organization. An example of this would be the emissions from the burning of natural gas or propane in on-site equipment. This is typically the second largest contributor to a facility's GHG emissions.

Scope 2 emissions are defined as indirect emissions from sources owned or controlled by the organization. An example of this would be the downstream emissions from electricity purchased from the grid for use in on-site equipment. This is typically the smallest contributor to a facility's GHG emissions.

Scope 3 emissions are defined as emissions from sources not owned or directly controlled by the organization. An example of this would be emissions from vehicles used in employee travel and commuting. Scope 3 emissions were not included in this inventory as it is difficult to quantify, and data is not readily available. However, this would typically be the largest contributor to a facility's GHG emissions.

Figure 2 summarizes the Town of Aurora's GHG emissions from 2014 - 2018. It is separated into Scope 1 and 2 emissions. It can be seen that Scope 1 and 2 emissions can be directly tied to a facility's electricity and natural gas consumption.

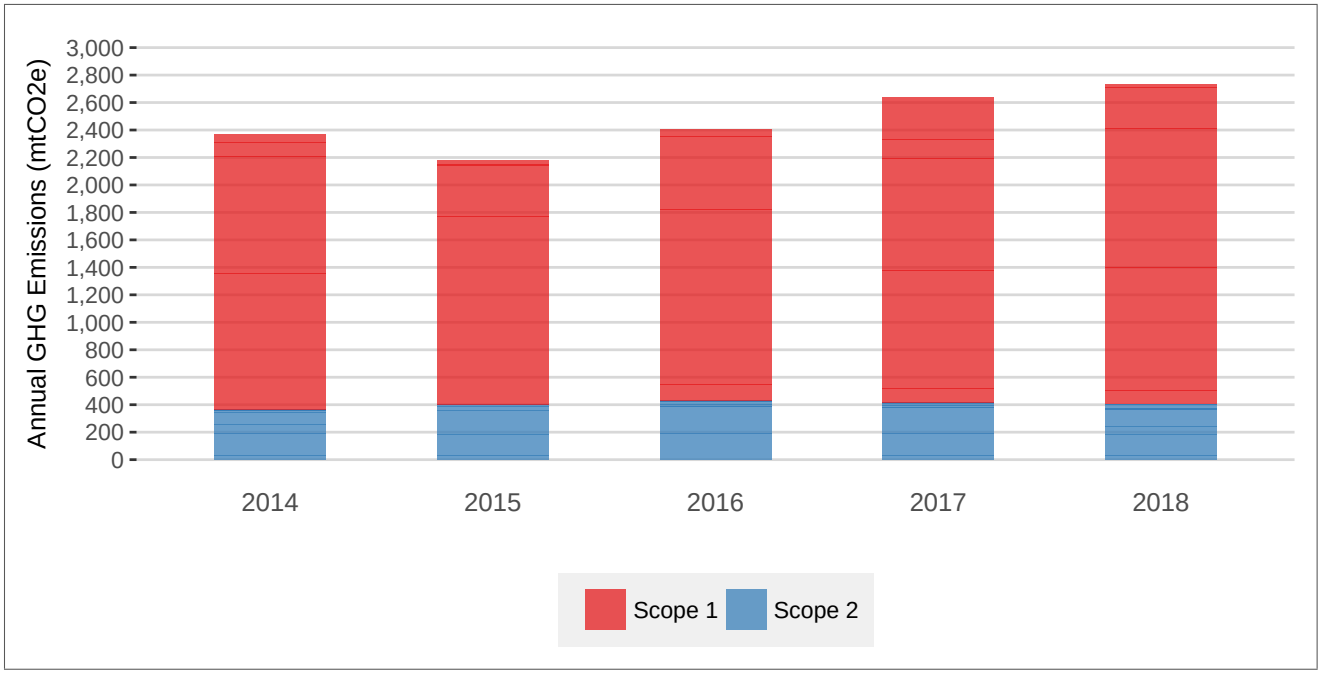


Figure 2: Annual GHG emissions

2.2 Energy Conservation Measures

2.2.1 Completed ECMs

A number of energy conservation measures (ECMs) have been implemented since the 2014 CDM plan was completed in an effort to achieve the goals set out in the plan. A list of the ECMs implemented to date is summarized in Table 4.

Some of the completed ECMs had their estimated capital costs and energy savings documented in energy audits, while others were simply implemented. All energy and cost estimates available were obtained from the completed energy audits.

The Town of Aurora has made use of numerous government incentives available to implement these projects. In 2017 alone, the Town of Aurora received a total of $473,294 in government grants and qualified for $39,577 in hydro incentives.

Table 4: Completed ECMs summary table

Building	ECM	Year Completed	Electricity Savings [kWh]	Natural Gas Savings [m^3]	Capital Cost [$]
Aurora Family Leisure Complex (AFLC)	LED parking lot lights	2014			
Aurora Town Hall	LED parking lot lights	2014			
Stronach Aurora Recreation Complex (SARC)	LED parking lot lights	2014			
Aurora Community Centre (ACC)	Interior LED Retrofit	2017	172,576	-15,949	78,152
Aurora Community Centre (ACC)	Arena LED Retrofit	2017	6,599	0	50,823
Aurora Community Centre (ACC)	Upgrade ice plant motor controls, replace shell and tube chillers	2017			
Aurora Community Centre (ACC)	Installation of new condensers and hot water boilers	2017			
Stronach Aurora Recreation Complex (SARC)	Interior LED Retrofit	2017	139,995	0	22,000
Stronach Aurora Recreation Complex (SARC)	Arena LED Retrofit	2017	293,599	0	143,000
Stronach Aurora Recreation Complex (SARC)	Pool MH to LED	2017	240,416	0	90,000
Stronach Aurora Recreation Complex (SARC)	LED retrofit: exterior	2017			
Stronach Aurora Recreation Complex (SARC)	Replace screw compressor	2017			
Stronach Aurora Recreation Complex (SARC)	Replacement of pool liner	2017			
Aurora Public Library	Interior Lighting Retrofit	2018	182,784	-2,352	103,000
Stronach Aurora Recreation Complex (SARC)	Low-flow Lavatories and Showerheads	2018	0	91,459	2,600

Note: Costs and energy savings provided by Stantec energy audits.

2.2.2 In-Progress ECMs

In addition to the ECMs already implemented, there are a number of ECMs which are already in-progress to be implemented. A list of the in-progress ECMs is summarized in Table 5. All energy and cost estimates available were obtained from the completed energy audits.

Table 5: In-Progress ECMs summary table

Building	ECM	Year Completed	Electricity Savings [kWh]	Natural Gas Savings [m^3]	Capital Cost [$]
Aurora Cultural Centre	Interior LED Retrofit	2019	10,035	229	20,000
Aurora Family Leisure Complex (AFLC)	Interior LED Retrofit	2019	57,624	-3,606	67,000
Aurora Family Leisure Complex (AFLC)	Pool LED Retrofit	2019	28,048	-2,211	27,000
Aurora Family Leisure Complex (AFLC)	Arena LED retrofit	2019	45,000	0	40,000
Aurora Seniors Centre	Interior CFL and T8 to LED Retrofit	2019	43,041	-2,628	9,000
Aurora Seniors Centre	Exterior LED Retrofit	2019	5,790	0	4,000
Aurora Town Hall	T8 Light to LED	2019	88,917	-2,719	85,000
Aurora Town Hall	CFL pot light to LED	2019	11,729	-2,719	2,200
Stronach Aurora Recreation Complex (SARC)	Replace screw compressor	2019			
Aurora Community Centre (ACC)	Replace fan coil units	2020			
Aurora Family Leisure Complex (AFLC)	Replace humidicon equipment	2020			
Aurora Family Leisure Complex (AFLC)	Arena low-e ceiling	2020	125,000	0	59,000
Aurora Family Leisure Complex (AFLC)	Exterior LED retrofit	2020	21,440	0	27,000
Stronach Aurora Recreation Complex (SARC)	Replace plumbing fixtures in arena change rooms	2020	0	45,730	23,800
Stronach Aurora Recreation Complex (SARC)	Low-E ceilings	2020	123,000	0	117,000
Aurora Community Centre (ACC)	Replace compressors	2021			
Aurora Community Centre (ACC)	Replace two heating boilers	2021			
Aurora Family Leisure Complex (AFLC)	Upgrade of climate control	2021			
Aurora Public Library	Replace rooftop HVAC	2021			
Aurora Public Library	LED exterior lighting retrofit	2021	194,520	0	23,000
Aurora Town Hall	Replace forced air and gas furnaces	2021			
Aurora Town Hall	LED exterior lighting retrofit	2021	17,957	0	39,000

Note: Costs and energy savings provided by Stantec energy audits.

2.2.3 Planned ECMs

There are a number of energy conservation opportunities across the facilities in the Town of Aurora. This section describes the ECMs which are planned to be implemented from 2019 - 2023.

A number of energy audits were completed for many of the Town of Aurora's facilities in 2017. These energy audits evaluated various ECMs and estimated their energy savings and implementation costs. A list of all ECMs evaluated in these energy audits is summarized in Table 6. ECMs with no simple payback period cost more in energy than what they are able to save and are therefore not good conservation projects.

Table 6: Facilities planned ECMs summary table

Building	**ECM**	**Electricity Savings** [kWh]	**Natural Gas Savings** [m^3]	**Capital Cost** [$]	**Simple Payback** [Years]
Aurora Community Centre (ACC)	Low-flow lavatory and shower	0	19,487	800	0.0
Aurora Community Centre (ACC)	Optimum start/stop	-10,166	10,585	5,835	2.7
Aurora Community Centre (ACC)	Occupancy sensors	10,945	-309	6,700	4.4
Aurora Community Centre (ACC)	Exterior LED retrofit	6,599	0	50,823	51.3
Aurora Community Centre (ACC)	Demand control ventilation	-934	2,778	6,800	
Aurora Cultural Centre	Occupancy sensors	14,536	20,685	4,800	0.4
Aurora Cultural Centre	Programmable thermostat	26,771	2,969	3,500	0.6
Aurora Cultural Centre	Exterior LED retrofit	2,369	0	5,000	11.3
Aurora Cultural Centre	Demand control ventilation	1,478	2,244	2,600	15.6
Aurora Family Leisure Complex (AFLC)	Low-flow lavatory and shower	0	9,867	2,200	0.1
Aurora Family Leisure Complex (AFLC)	Optimum start/stop	9,655	1,645	6,400	3.1
Aurora Family Leisure Complex (AFLC)	Demand control ventilation	6,862	8,383	9,800	3.2
Aurora Public Library	Occupancy sensors	12,447	-281	5,100	2.8
Aurora Public Library	Optimum start/stop	3,588	3,894	6,107	3.1
Aurora Public Library	Boiler replacement	10	6,757	127,464	53.3
Aurora Public Library	Demand control ventilation	-7,038	2,541	7,400	
Aurora Seniors Centre	Low-flow lavatories	0	1,710	200	0.1
Aurora Seniors Centre	Demand control ventilation	2,924	2,188	5,500	13.5
Aurora Seniors Centre	Occupancy sensors	12,570	-1,081	6,600	16.2
Aurora Seniors Centre	VVT systems	-514	800	10,900	42.7
Aurora Town Hall	Low-flow lavatory and shower	16,850	0	500	0.1
Aurora Town Hall	Demand control ventilation	29,108	5,820	5,100	0.9
Aurora Town Hall	Optimum start/stop	9,376	2,207	12,000	5.4
Aurora Town Hall	Low-flow toilet fixtures	0	0	19,000	8.9
Aurora Town Hall	Occupancy sensors	1,068	519	15,000	44.4
Stronach Aurora Recreation Complex (SARC)	Daylighting	78,472	-381	11,000	1.0
Stronach Aurora Recreation Complex (SARC)	Optimum start/stop	7,889	911	4,100	2.9
Victoria Hall	Low-flow lavatory fixtures	916	0	100	0.5
Victoria Hall	Programmable thermostat	76	420	300	1.2
Victoria Hall	Occupancy sensors	224	0	200	4.4
Victoria Hall	Interior LED retrofit	1,313	-104	1,100	4.6

Note: Costs and energy savings provided by Stantec energy audits.

However, not all ECMs evaluated are financially feasible (simple payback < 10 years). Table 7 summarizes ECMs evaluated in the energy audits which had a simple payback of less than 10 years. This ensures that the planned ECMs are financially feasible and provide good value to the Town of Aurora. These ECMs are planned to be implemented from 2019 - 2023.

Table 7: Facilities planned ECMs summary table

Building	ECM	Electricity Savings [kWh]	Natural Gas Savings [m^3]	Capital Cost [$]	Simple Payback [Years]
Aurora Community Centre (ACC)	Low-flow lavatory and shower	0	19,487	800	0.0
Aurora Community Centre (ACC)	Optimum start/stop	-10,166	10,585	5,835	2.7
Aurora Community Centre (ACC)	Occupancy sensors	10,945	-309	6,700	4.4
Aurora Cultural Centre	Occupancy sensors	14,536	20,685	4,800	0.4
Aurora Cultural Centre	Programmable thermostat	26,771	2,969	3,500	0.6
Aurora Family Leisure Complex (AFLC)	Low-flow lavatory and shower	0	9,867	2,200	0.1
Aurora Family Leisure Complex (AFLC)	Optimum start/stop	9,655	1,645	6,400	3.1
Aurora Family Leisure Complex (AFLC)	Demand control ventilation	6,862	8,383	9,800	3.2
Aurora Public Library	Occupancy sensors	12,447	-281	5,100	2.8
Aurora Public Library	Optimum start/stop	3,588	3,894	6,107	3.1
Aurora Seniors Centre	Low-flow lavatories	0	1,710	200	0.1
Aurora Town Hall	Low-flow lavatory and shower	16,850	0	500	0.1
Aurora Town Hall	Demand control ventilation	29,108	5,820	5,100	0.9
Aurora Town Hall	Optimum start/stop	9,376	2,207	12,000	5.4
Stronach Aurora Recreation Complex (SARC)	Daylighting	78,472	-381	11,000	1.0
Stronach Aurora Recreation Complex (SARC)	Optimum start/stop	7,889	911	4,100	2.9
Victoria Hall	Low-flow lavatory fixtures	916	0	100	0.5
Victoria Hall	Programmable thermostat	76	420	300	1.2
Victoria Hall	Occupancy sensors	224	0	200	4.4
Victoria Hall	Interior LED retrofit	1,313	-104	1,100	4.6

Note: Costs and energy savings provided by Stantec energy audits.

A benchmarking analysis has been completed to show the facilities' electricity use intensity (EUI) and greenhouse gas intensity (GHGI) for 2014 - 2018, and compares them to similar facilities in the largest municipalities in Southern Ontario. This benchmarking analysis can help determine which facilities are performing poorly compared to similar facilities in other Ontario municipalities. This can be found in the Appendices.

The Town of Aurora will keep this analysis in consideration when determining which facilities to prioritize for ECM implementation.

2.3 Goals

Table 8 summarizes the energy and GHG emissions reductions that can be expected to be achieved if all ECMs shown in Table 5 and 7 are implemented.

Table 8: Town of Aurora facilities goal summary

		Administrative Offices	Public Facilities	Indoor Recreation Facilities	Total
Electricity Consumption Reduction	[kWh]	173,937	313,257	503,769	990,963
Electricity Consumption Reduction	[%]	1.9	3.3	5.4	10.5
Natural Gas Consumption Reduction	[m^3]	2,589	26,894	90,101	119,584
Natural Gas Consumption Reduction	[%]	0.21	2.2	7.3	9.7
GHG Emissions Reduction	[mtCO2e]	12	64	192	268
GHG Emissions Reduction	[%]	0.38	2	5.9	8.3
Implementation Cost	[$]	143,800	77,407	407,635	628,842

*Reductions based on 2018 baseline energy consumption and GHG emissions.

The overall goal for the Town of Aurora's facilities is to reduce electricity consumption by **10.5%** (990,963 kWh), natural gas consumption by **9.7%** (119,584 m^3), and GHG emissions by **8.3%** (268 mtCO2e) of the 2018 baseline by the end of 2023. This is expected to require an investment of approximately **$628,842**.

3 WATER/WASTE WATER FACILITIES

3.1 Baseline

A list of the facilities included in this section are summarized in Table 9.

Table 9: Water/Waste water facilities list

Building	Address	Year	Area [sqft]
Vandorf Water Booster Station	85 Vandorf Sideroad	1998	1,000
Vandorf Lift Station	385 Vandorf Sideraod	1997	215
Ballymore Lift Station	560 St Johns Sideroad East	1996	102
Temperance Street Lift Station	15140 Yonge Street	2001	10
Brentwood Lift Station	3 Woodland Hills Boulevard	2003	215
State Farm Lift Station	24 State Farm Way	2006	460
Elderberry Trail Lift Station	12 Equestrian Drive	2006	460

3.1.1 Energy Consumption

Figure 3 summarizes the water/waste water facilities' annual electricity consumption from 2014 - 2018.

Electricity consumption for water/waste water facilities is dependent on the volume of water processed. Therefore the annual electricity consumption is typically expressed in kilowatts per volume processed. However, this information was not available for Town of Aurora's facilities so the total annual consumption is shown instead.

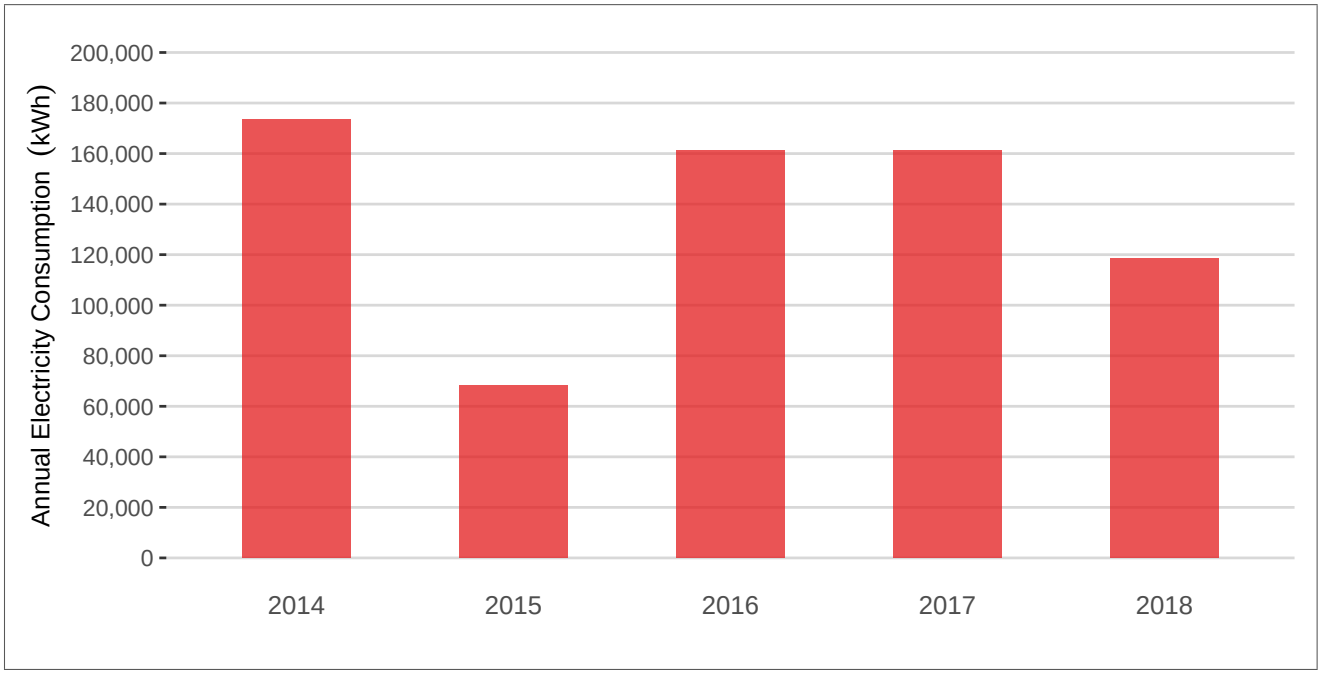


Figure 3: Annual electricity consumption for water/wastewater treatment facilities

3.1.2 GHG Emissions

Figure 4 summarizes the water/waste water facilities' GHG emissions from 2014 - 2018. It is separated by into Scope 1 and 2 emissions. Scope 1 and 2 emissions are directly tied to a facility's electricity and natural gas

consumption. However, these facilities do not consume natural gas and so annual GHG emissions consist only of Scope 2 emissions.

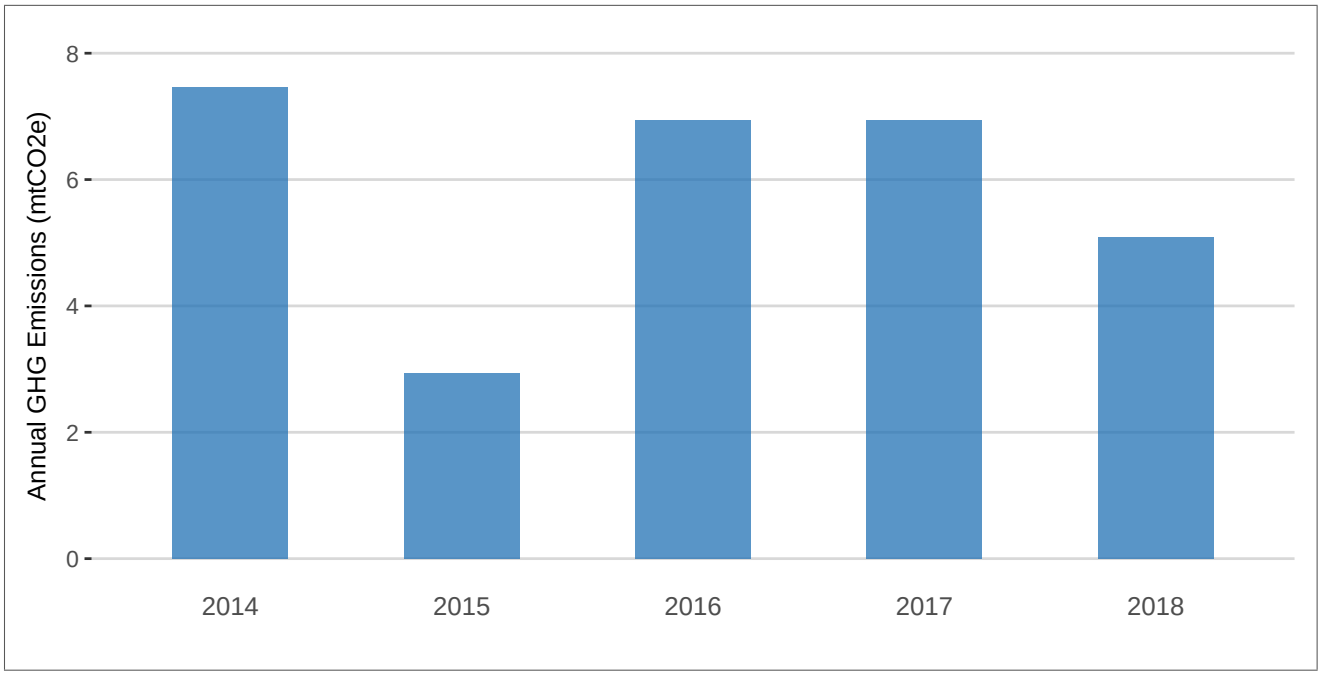


Figure 4: Annual GHG emissions for water/waste water facilities

3.2 Energy Conservation Measures

3.2.1 Completed ECMs

No ECMs have been completed for this category of facilities.

3.2.2 In-Progress ECMs

No ECMs are planned for this category of facilities.

3.2.3 Planned ECMs

As the water/waste water facilities contribute an insignificant amount to Town of Aurora's overall energy consumption and GHG emissions, it is not recommended to have energy audits completed or ECMs implemented at these facilities at this time.

3.3 Goals

It is difficult to define concrete electricity reduction goals for water/waste water facilities as there are no in-progress or planned ECMs for these facilities. As a result, the Town of Aurora will simply continue to monitor overall electricity consumption over the next five years as new facilities are brought online.

4 FLEET

4.1 Baseline

Figure 5 shows the distance traveled by each of Town of Aurora's fleet vehicles from December 2017 - December 2018.

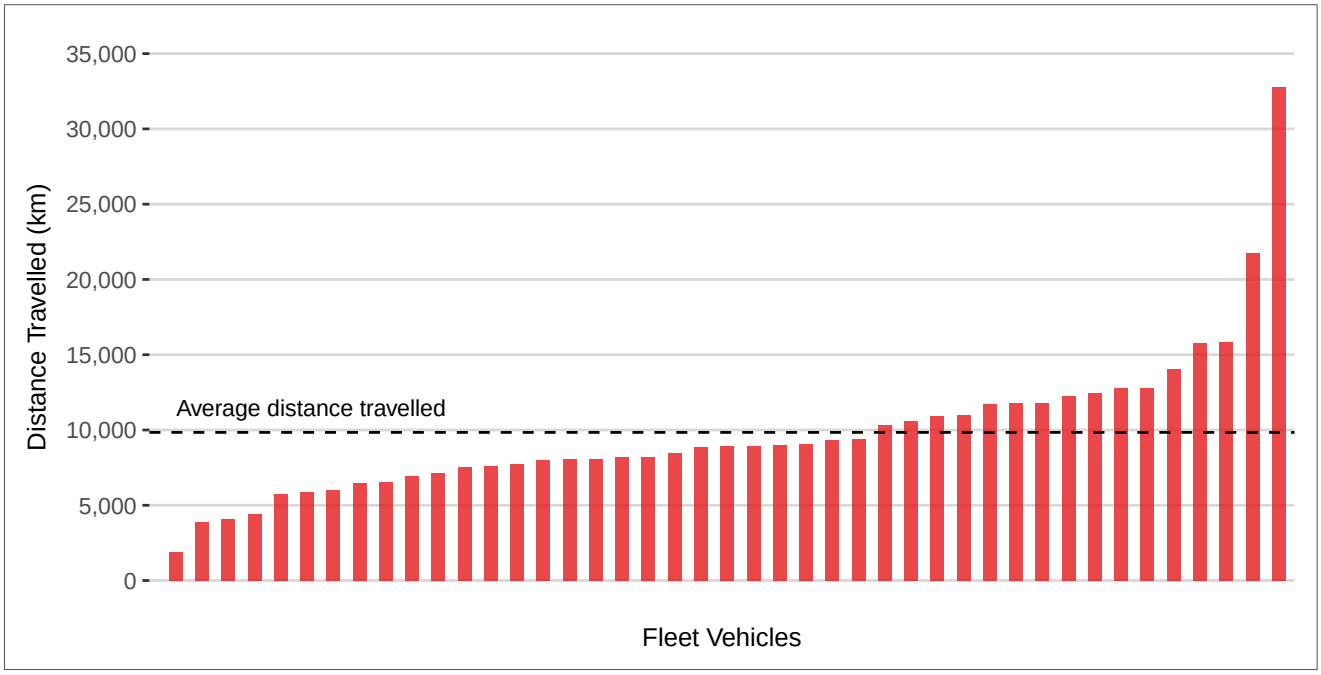


Figure 5: Distance travelled by fleet vehicles from December 2017 - December 2018

Table 10 summarizes the total distance traveled, fuel consumed, and GHG emissions. GHG emissions from fleet vehicles are categorized under Scope 1.

Table 10: Fleet vehicles annual summary

Annual Distance Traveled	[km]	423,135
Annual Gasoline Consumed	[L]	91,544
Annual Diesel Consumed	[L]	104,238
Average Fuel Efficiency	[L/100km]	46
Annual GHG Emissions*	[mtCO2e]	491

*Based on 2.3 kg/L of gasoline and 2.7 kg/L of diesel consumed.

4.2 Proposed GHG Reduction Measures

The following actions were identified as per the June 2018 Corporate Environmental Action Plan (CEAP).

- **Develop a green fleet plan**
  - Addresses new green fleet procurement and replacement of older fleet vehicles. The plan should consider alternative fuels, high efficiency vehicles, and hybrid/electric options.
  - The Town of Aurora is aware that there would be extra maintenance costs, specialty equipment, and training and certifications for mechanics associated with hybrid/electric options. The Town of Aurora will keep these items in consideration when evaluating the benefits of hybrid/electric options.

  - Develop an electric vehicle charging station usage fee policy and maintenance plan.
- **Implement an anti-idling initiative**
  - Will include working with schools to educate parents and public. This will also include the implementation of an anti-idling campaign for town staff and contractors.

The poor average fuel efficiency is likely a result of less efficient vehicles in the fleet and the idling of vehicles. It is recommended that these actions from the CEAP be implemented to reduce annual GHG emissions from fleet vehicles. An additional measure to consider is driver/operator training to provide education on the most efficient way to operate fleet vehicles.

4.3 Goals

GHG emissions are directly related to the amount of fuel consumed. As a result, reducing the fuel consumed by improving average fuel efficiency will reduce GHG emissions proportionally. Vehicles in Canada have an average highway-city combined fuel efficiency of approximately 10 L/100km. Fleet vehicles would likely be driving in the city the majority of the time, but should still be able to achieve an average fuel efficiency of 23 L/100km. Table 11 summarizes the goals for fleet vehicles if they were to improve their average fuel efficiency.

Table 11: Fleet vehicles goal summary

Average Fuel Efficiency	[L/100km]	23
Annual Fuel Savings	[L]	97,891
Annual GHG Emissions Reduction	[mtCO2e]	245
Annual GHG Emissions Reduction	[%]	50

*Reductions based on 2018 baseline fuel consumption and GHG emissions.

The goal for fleet vehicles is to improve average fuel efficiency to **23 L/100km** and reduce GHG emissions by **50%** (245 mtCO2e).

5 RENEWABLE GENERATION

Solar PV has been installed at a total of four facilities as a means of renewable generation. None of the electricity generated by these installations is used on site as they feed back into the grid through the IESO's Feed-in Tariff (FIT) program. Figure 6 summarizes the annual electricity generation from all sites from 2014 - 2018.

Table 12 summarizes the total electricity generated by the four facilities from 2014 - 2018.

Table 12: Solar PV generation summary

		Aurora Public Library	**Aurora Town Hall**	**Joint Operations Centre**	**Stronach Aurora Recreation Complex**	**Total**
Electricity Generated	[kWh]	28,474	47,950	76,093	1,352,648	1,505,165

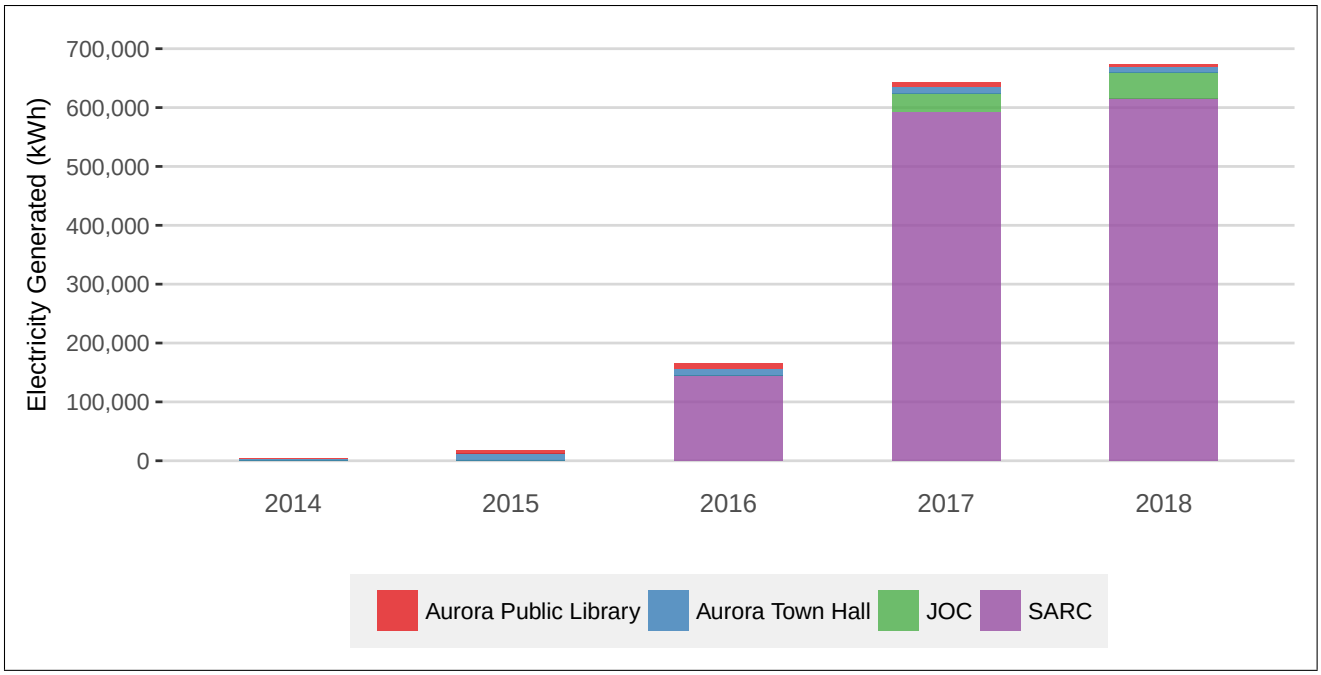


Figure 6: Annual solar PV electricity generation

6 GOALS SUMMARY

This section will summarize the Town of Aurora's previous goals from the 2014 ECDM plan, current goals for the 2019 ECDM plan, an action plan on how to achieve the current goals, and some additional energy management strategies to consider.

6.1 Previous

The 2014 Corporate Energy Management Plan (CEMP) identified a number of actions to be achieved and implemented by 2019. These are summarized in Table 13.

Although the Town of Aurora has taken initiative in implementing a number of the above actions from 2014 - 2018, there are still many opportunities remaining. These opportunities should be kept in mind even when moving forward with the current plan.

Table 13: Town of Aurora 2014 ECDM plan actions summary

Action	Status
1. Implement all feasible energy efficiency improvements for existing town-owned facilities as outlined in Building Portfolio Energy Analyses and Assessments.	On-going
2. Conduct an audit of the five highest energy consuming town-owned buildings.	Addressed
3. Examine opportunities to expand the corporate O&M preventative maintenance program at town facilities.	On-going
4. Conduct a life-cycle audit of town-owned infrastructure and equipment, and assess opportunities for energy efficiency upgrades.	Addressed
5. Implement a minimum green building standard of LEED Silver for all new town facilities.	On-going
6. Consider opportunities to upgrade town-owned fleet vehicles to reduce costs and energy consumption.	Not financially feasible
7. Regularly communicate energy initiatives as part of the CEAP brand.	On-going
8. Conduct energy efficiency training for staff as required.	Not addressed
9. Include general training on energy and energy efficiency as part of the town's onboarding process.	Not addressed
10. Explore strategic partnerships with Energy Services Company (ESCO) to identify and fund energy efficiency projects.	Not addressed
11. Adopt energy efficiency standards to guide the procurement of town-owned equipment.	Not addressed
12. Continue to implement town-wide energy management system (EMS).	Not addressed
13. Conduct an assessment of the metering needs of each town-owned facility.	Not financially feasible
14. Document the savings achieved from energy efficiency projects and rolling out successful projects.	On-going
15. Develop corporate GHG emissions targets and corporate energy efficiency targets.	On-going
16. Develop consistent guidelines and policies for energy management.	On-going

6.2 Current

Table 14 summarizes the energy consumption and GHG emissions for Town of Aurora facilities and fleet for 2018. This is the baseline which the current goal will be based on.

Table 14: Town of Aurora 2018 baseline energy consumption and GHG emissions summary

		Administrative Offices	Public Facilities	Indoor Recreation Facilities	Water/Waste Water Facilities	Fleet	Total
Electricity Consumption	[kWh]	1,299,380	1,220,316	6,761,361	118,358	-	9,399,415
Natural Gas Consumption	[m^3]	193,359	119,928	921,252	-	-	1,234,539
GHG Emissions	[mtCO2e]	421	279	2,030	5.1	491	3,226

The energy consumption and GHG emissions reduction goals Town of Aurora will achieve by 2023 are summarized in Table 15. Figure 7 summarizes the results of achieving the goals set in this plan. It compares the estimated 2023 energy consumption to the 2018 energy consumption.

The overall goal is to reduce electricity consumption by **10.5%** (990,963 kWh), natural gas consumption by **9.7%** (119,584 m^3), and GHG emissions by **15.9%** (514 mtCO2e) of the 2018 baseline by the end of 2023. This is expected to require an investment of approximately **$628,842**.

Table 15: Town of Aurora 2023 goals summary

		Administrative Offices	**Public Facilities**	**Indoor Recreation Facilities**	**Water/Waste Water Facilities**	**Fleet**	**Total**
Electricity Consumption Reduction	[kWh]	173,937	313,257	503,769	-	-	990,963
Electricity Consumption Reduction	[%]	1.9	3.3	5.4	-	-	10.5
Natural Gas Consumption Reduction	[m^3]	2,589	26,894	90,101	-	-	119,584
Natural Gas Consumption Reduction	[%]	0.21	2.2	7.3	-	-	9.7
GHG Emissions Reduction	[mtCO2e]	12	64	192	-	245	514
GHG Emissions Reduction	[%]	0.38	2	5.9	-	7.6	15.9
Implementation Cost	[$]	143,800	77,407	407,635	-	-	628,842

*Reductions based on 2018 baseline energy and GHG emissions.
* Water/Waste water facilities contributed the least to energy consumption and GHG emissions of all Town of Aurora facilities (Table 1). As such, goals for energy consumpion and GHG emissions reductions were focused on other facilities.

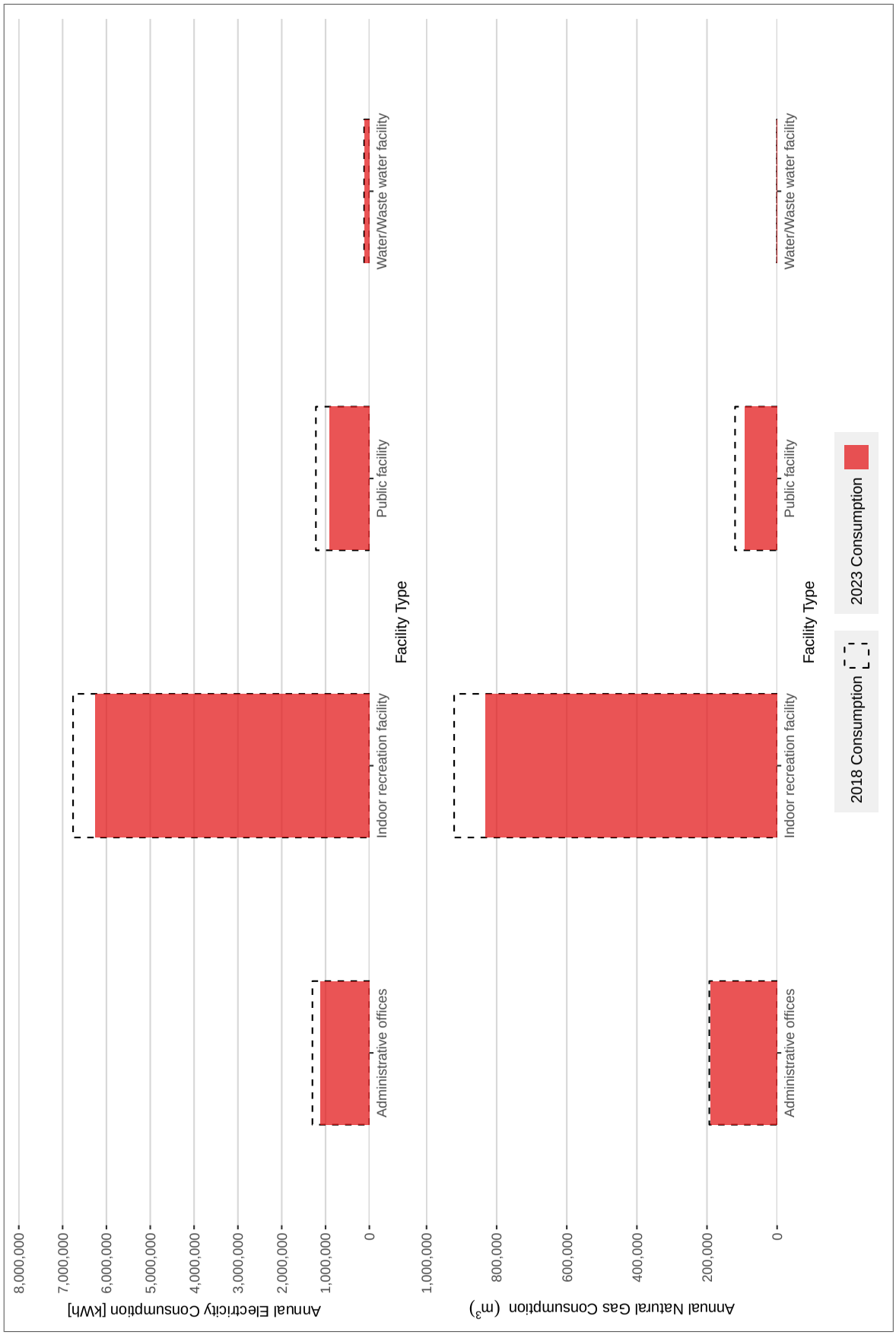


Figure 7: Comparison of baseline and projected consumption values of 2018 and 2023

6.3 Action Plan

Below are the actions that need to be taken in order to achieve the goals set in Section 6.2

- **Facilities**
  1. Ensure all in-progress ECMs will be implemented by 2023.
  2. Ensure all planned ECMs will be implemented by 2023. Prioritize poorest performing facilities (as identified by the benchmarking analysis), and ECMs with largest potential electricity and natural gas savings.
  3. Obtain government and utility (IESO, Enbridge) incentives when implementing ECMs, and document estimated electricity and natural gas savings.
  4. Have updated energy audits completed by 2023 to investigate potential measures for 2024 ECDM plan update.
- **Water/waste water facilities**
  1. Continue to monitor and track electricity consumption as new facilities are brought online.
- **Fleet**
  1. Develop green fleet plan, provide driver/operator training, and implement anti-idling initiative to improve fuel efficiency and reduce GHG emissions.
  2. Measure distance traveled, fuel consumed, and average fuel efficiency of fleet vehicles at regular intervals to track progress.

6.4 Additional Strategies

6.4.1 Previous

A motion was put forth in a Town of Aurora council meeting on June 12, 2018 which recommended Town of Aurora employees to investigate/implement energy conscious behavioral changes. These changes are summarized as follows:

- A plan to diminish the use of lights in buildings and facilities during the night hours;
- Raise the temperature setting in Town of Aurora buildings by one degree in the summer months, and lower the temperature by one degree in the winter months;
- Decrease kitchen and bathroom hot water temperature settings;
- Mitigate the summer sun effect from the Town Hall Atrium and main floor south-facing windows; and
- Install automatic room timers on a five-minute empty room shut-off.

6.4.2 Current

The following strategies should also be considered from a strategic energy management perspective:

- Implement life cycle cost purchasing practices
  - Money spent achieving energy efficiency is often overlooked in the decision making process.
  - Make use of life cycle cost analysis on all new construction, major renovations and equipment over $50,000 rather than simply evaluating first costs.
  - Consider energy efficiency upgrades during renovations or equipment replacements rather than purchasing "like for like".
- Establish purchasing specifications of energy efficiency equipment and services

  - Establish efficiency specifications for standard equipment routinely replaced (e.g. lights, motors, HVAC equipment).
  - Develop engineering tender documents that favour energy efficient equipment rather than lowest capital cost.
  - Establish efficiency standards for design and construction, building operations, and maintenance services.
- Monitor, track, and reward progress
  - Record metrics (electricity consumption savings, natural gas consumption savings, capital costs, etc.) for all major ECM projects implemented.
  - Establish a reward/recognition program for successes to encourage participation.
- Improve communication and engagement
  - Leverage communication channels (e.g. Town of Aurora website, internal bulletins) to advertise successes of retrofit projects for staff and the public.
  - Implement specific training to O&M staff as needed (e.g. new technology, best practices).
  - Implement general training to all staff on energy efficiency best practices.

Appendix A: Benchmarking Analysis

This benchmarking analysis compares the 2018 electricity and GHG intensity (EUI and GHGI) of the Town of Aurora's facilities against the 2016 median EUI and GHGI for the largest 42 municipalities in southern Ontario. This analysis was completed for the following facility categories: administrative offices, public facilities, and indoor recreational facilities. Facilities performing worse than the Ontario median should be prioritized for implementation of energy conservation measures (ECMs).

Administrative Offices

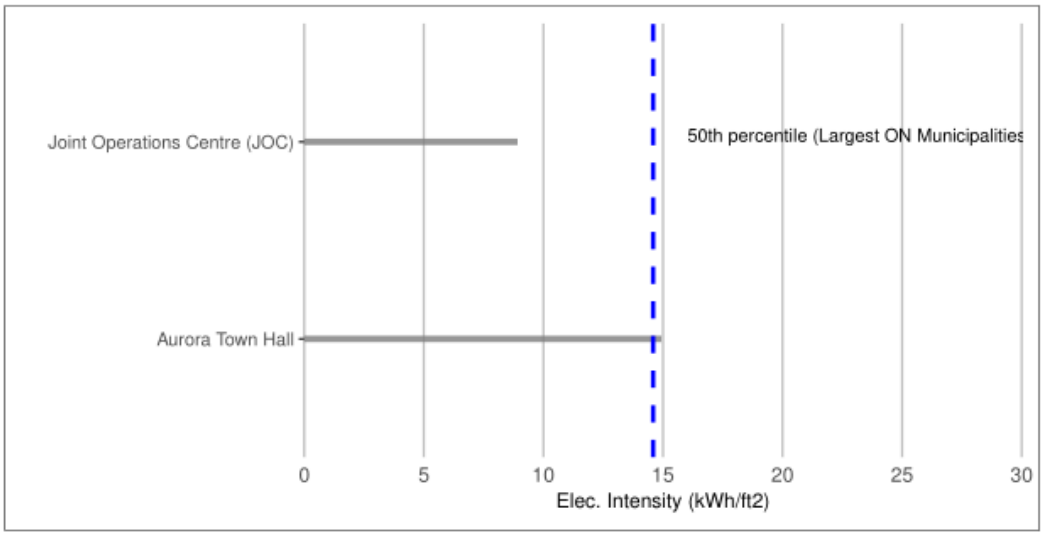


Figure 1: 2018 EUI for administrative offices

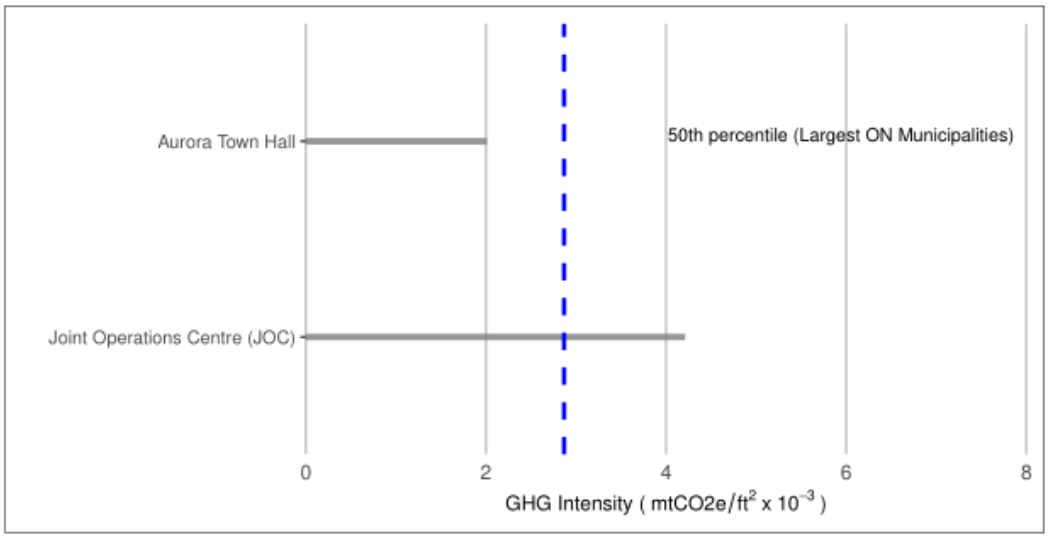


Figure 2: 2018 GHGI for administrative offices

As seen in Figure 1 and 2, the Town of Aurora's administrative office facilities are performing near the Ontario median. However, the JOC has a slightly higher GHGI (due to higher natural gas consumption per unit area) than the Ontario median.

Public Facilities

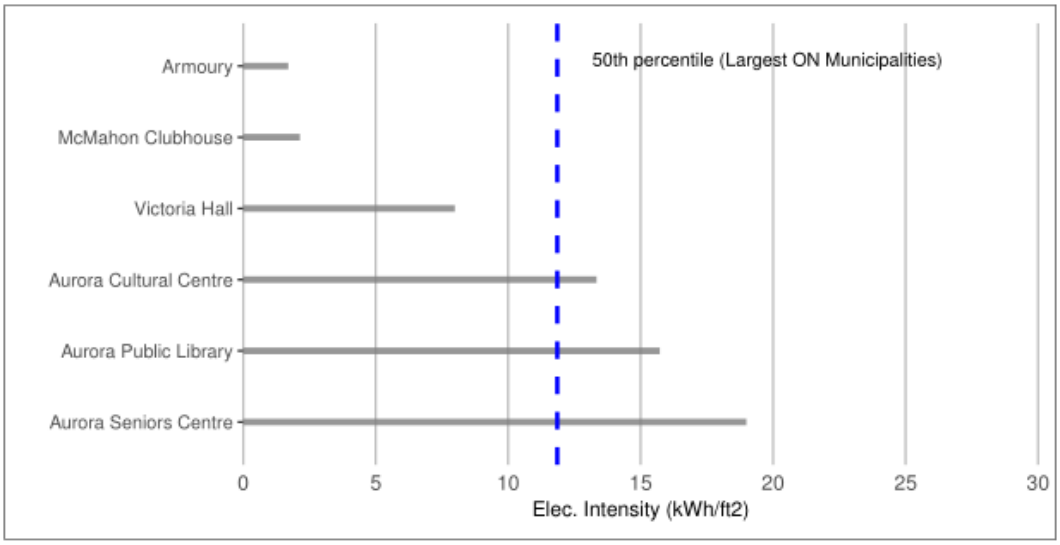


Figure 3: 2018 EUI for public facilities

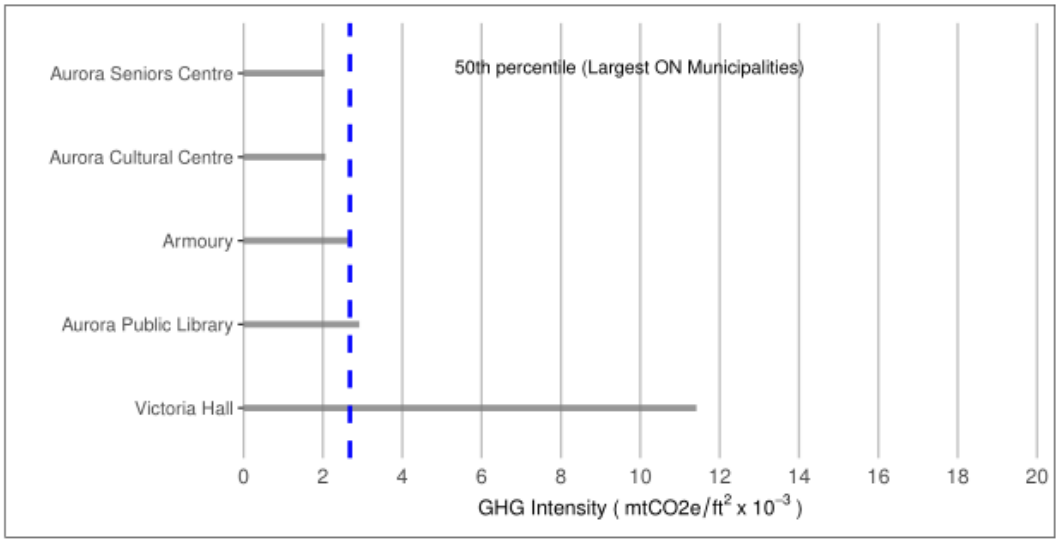


Figure 4: 2018 GHGI for public facilities

As seen in Figure 3 and 4, most of the Town of Aurora's public facilities compare favourably against the Ontario median. However, the Aurora public library and Aurora Seniors Centre have higher electricity consumption (per unit area) than the Ontario median, and Victoria Hall has a significantly higher GHGI (due to higher natural gas consumption per unit area) than the Ontario median.

Indoor Recreational Facilities

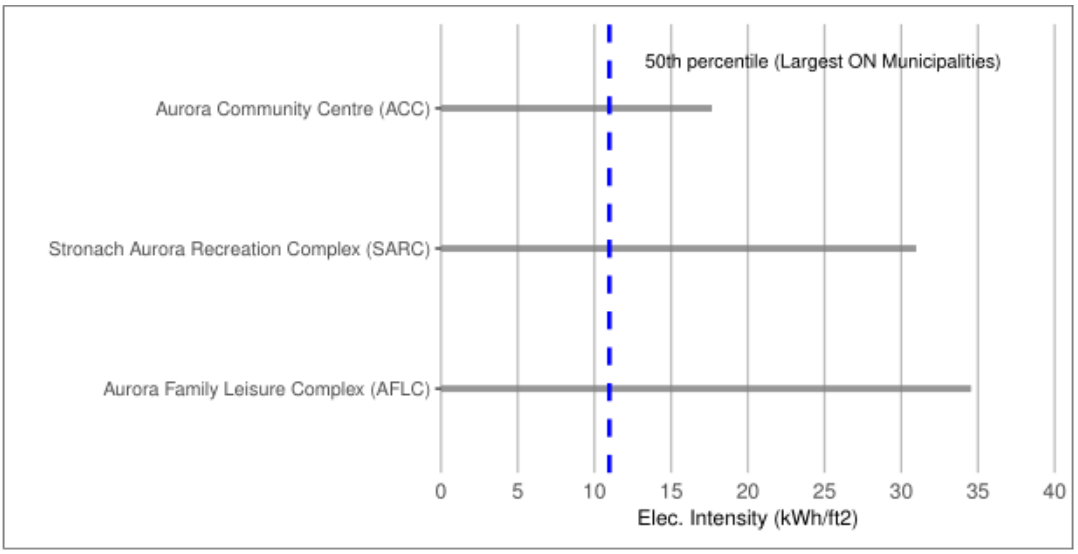


Figure 5: 2018 EUI For indoor recreational facilities

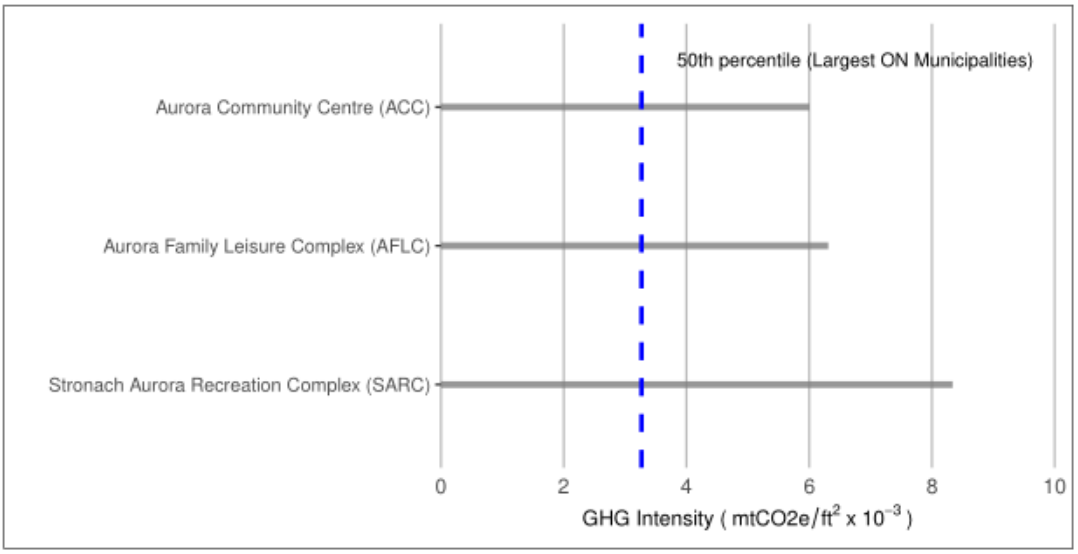


Figure 6: 2018 GHGI for indoor recreational facilities

As seen in Figure 5 and 6, most of the Town of Aurora's indoor recreational facilities compare poorly against the Ontario median. All of the Town of Aurora's indoor recreational facilities have higher electricity consumption (per unit area) and GHGI (due to higher natural gas consumption per unit area) than the Ontario median.

Appendix B: Best-in-class Review

1.0 Introduction

This best-in-class review examined the Energy Conservation and Demand Management (ECDM) plans of the most energy efficient municipalities in an effort to understand the strategies they are employing to achieve energy efficiency.

In order to complete this review, the most energy efficient municipalities had to be first identified. This was completed using the annual utility data published for each municipality under the Broader Public Sectors (BPS) reporting program.

The facilities in the largest 42 municipalities in Southern Ontario were first separated by building type (e.g. administrative offices, community centres, indoor recreation centres, etc.). The energy use intensity (EUI) (ekWh/sqft) was calculated for each facility and compared against the median EUI of all facilities in the dataset for that building type. This analysis was able to determine the "Top 5" most energy efficient municipalities for each building type.

The municipalities which had the most "Top 5" appearances were determined to be the most energy efficient. These municipalities are as follows, and their ECDM plans were reviewed to complete this document:

- City of Guelph
- Town of Halton Hills
- City of Kawartha Lakes
- City of Niagara Falls
- City of Vaughan

2.0 City of Guelph (2013 – 2018)

2.1 Goals

The City of Guelph ECDM plan did not outline a short term goal but they have a long term goal of reducing total energy use (electricity and natural gas) by 28% of 2011 values by 2031.

2.2 Completed

Completed energy initiatives were not discussed. However, the City of Guelph grades themselves on various areas of their Corporate Energy Management program each year and publishes their results. This evaluation provides an idea of how energy conscious the city is. Overall, their scores have historically been poor in most areas (< 2 on a scale of 1 – 4) but have shown improvement in recent years.

2.3 Planned

2.3.1 Organizational

There are a number of changes planned on the organizational level. The following is a summary of the planned actions at a high level:

- Create energy policies related to operations, capital replacement, and procurement.
    - Consider life cycle analyses when purchases and investments have energy efficiency impacts.
    - Require energy staff to comment on new build, refurbishment, and plant replacement projects.
- Obtain commitment of senior management to the environmental strategy.
- Improve corporate energy management system to track energy use.
- Increase use of communication channels to relay successes of energy efficiency projects.
- Ensure staff are well trained on energy efficiency. Ensure energy staff are up to date on best practices and industry trends.
- Continue to identify energy efficiency opportunities through energy audits and continuous commissioning.

2.3.2 Retrofit

Energy conservation measures (ECMs) were focused in the following areas:

- LED lighting retrofits.
- Arena refrigeration plant ugprades.
- Arena refrigeration plant controls.
- HVAC heating system upgrades.
- HVAC system controls.

2.4 Key Takeaways

The planned organizational changes are all strategies that should be considered. The planned retrofits are the typical “low hanging fruit” which are identified in energy audits. Conducting an annual review of a municipality’s Corporate Energy Management program is another item which should be considered.

3.0 Town of Halton Hills (2014 – 2018)

3.1 Goals

The Town of Halton Hills plans to reduce overall EUI (ekWh/sqft) by 16.7% and GHG emissions (kg) by 20.5% of 2011 values by 2019.

3.2 Completed

Completed initiatives were not discussed. However, energy audits on seven major of the town's facilities and a comprehensive review of past energy efficiency projects were completed prior to creating the plan.

3.3 Planned

3.3.1 Organizational

There are a number of changes planned on the organizational level. The following is a summary of the planned actions at a high level:

- Develop centralized energy facilities management role to be responsible for energy initiatives and Corporate Energy Plan.
- Develop energy efficiency policies for buildings and equipment. Consider life cycle cost analysis.
- Implement energy management system to track energy use.
- Measure and track results achieved from energy efficiency projects.
- Improve communication of energy management initiatives to staff and public.
- Develop employee engagement program.
- Improve energy efficiency training for staff (includes driver training to reduce GHG emissions).
- Examine feasibility of implementing renewable technologies.

3.3.2 Retrofit

Energy conservation measures (ECMs) were focused in the following areas:

- LED lighting retrofits.
- HVAC system optimization.
- DHW system optimization.
- VFD implementation.
- Recommissioning.

3.4 Key Takeaways

Large emphasis on ensuring the organization as a whole has energy efficiency as a part of their culture.

4.0 City of Kawartha Lakes (2016 – 2021)

4.1 Goals

The City of Kawartha Lakes plans to reduce EUI by 10% of 2015 values by 2021.

4.2 Completed

4.2.1 Organizational

There are a number of changes completed on the organizational level. The following is a summary of the completed actions at a high level:

- Developed Energy Stewards team whose key role is to champion the ECDM plan.
    - Composed of team members from Community Services and Development Services departments.
- Developed Hydro Conservation champions program whose role is to initiate behaviour changes to reduce electricity consumption in municipal facilities.
    - 62 members joined within the first year of inception.
    - Members are provided some training on energy efficiency and energy management.
    - Resulted in savings of $116,000 annually and over 10% electricity consumption reduction in top 20 energy consuming facilities.

4.2.2 Retrofit

This was not discussed in the ECDM plan.

4.3 Planned

4.3.1 Organizational

There are a number of changes planned on the organizational level. The following is a summary of the planned actions at a high level:

- Implement energy supply chain management system to consolidate supplier information, consumption data, and cost, all in one location.
- Improve corporate communications to raise awareness on energy conservation and corporate energy initiatives.
- Make energy conservation a key pillar in corporate culture.
- Implement anti-idling policy.
- Provide vehicle training to outline how to operate vehicles efficiently.

4.3.2 Retrofit

Energy conservation measures (ECMs) were focused in the following areas:

- HVAC system retrofits.
- Reduce redundant facilities, consolidate multiple offices into one building.
- LED lighting retrofits.
- Collect methane from landfills.
- Tenant education programs.

4.4 Key Takeaways

Large emphasis on ensuring the organization as a whole has energy efficiency as a part of their culture.

5.0 City of Niagara Falls (2014 – 2018)

5.1 Goals

The City of Niagara Falls plans to reduce energy savings by 7.5% of the 2011 baseline by 2019.

5.2 Completed

5.2.1 Organizational

There are a number of changes completed on the organizational level. The following is a summary of the completed actions at a high level:

- Level 1 energy audits completed one year before ECDM plan.
- Detailed energy audit completed on City Hall and DES on equipment replacements and HVAC system upgrades (cooling plant).
    - Led to completing HVAC system redesign.
- Municipal council plays a lead role in energy conservation by demonstrating interest in innovation and energy efficiency.

5.2.2 Retrofit

Energy conservation measures (ECMs) were focused in the following areas:

- Operational improvements at large arenas to reduce energy use by 12% (1,500,000 ekWh).
- Lighting retrofits at two fire halls and City Hall.
- Lighting retrofits at 19 smaller facilities.

5.3 Planned

5.3.1 Organizational

This was not discussed in the ECDM plan.

5.3.2 Retrofit

Energy conservation measures (ECMs) were focused in the following areas:

- LED lighting retrofits of street lights.
- LED lighting retrofits.
- HVAC system optimization.
- Boiler replacements.
- New transit/bus terminal designed to be energy efficient.
    - Worked with architects to ensure this happened.
    - Estimated to use 3,600,000 ekWh less annually than a base case building.

5.4 Key Takeaways

Commitment to energy efficiency at a council level can make a big different in pushing forward energy efficiency initiatives. Energy audits and detailed engineering studies are greatly beneficial in identifying ECMs, but it is also important to bring energy efficiency into the design of new buildings as well.

6.0 City of Vaughan (2014 – 2018)

6.1 Goals

The City of Vaughan has plans to reduce the following:

- 10% overall energy consumption reduction for facilities on per person served basis (ekWh/sqft)
- 10% water consumption reduction for facilities on per person served basis (m3/sqft)
- 10% energy cost reduction for facilities (adjusted for utility escalation rate) ($/sqft)
- 20% electricity consumption reduction for street lighting (kWh)

6.2 Completed

6.2.1 Organizational

This was not discussed in the ECDM plan.

6.2.2 Retrofit

This was not discussed in the ECDM plan.

6.3 Planned

6.3.1 Organizational

There are a number of changes completed on the organizational level. The following is a summary of the completed actions at a high level:

- Develop standard operating procedures for major electrical and mechanical systems in similar facilities (arenas, pools, libraries, etc.).
- Implement Energy Management System to monitor energy use.
    - Will help identify anomalies in building operation and energy use.
    - Will also help in benchmarking facilities.
- Consider continuous commissioning to bring old equipment back to factory performance.
- Provide energy efficiency training at all levels, from management to engineering supervisors to operators.
- Create internal team to be responsible for ECDM and guide activities in the plan.
- Raise awareness of the importance of energy efficiency to senior and middle management.

6.3.2 Retrofit

Energy conservation measures (ECMs) were focused in the following areas:

- Minimum energy efficiency standards for new buildings.

- Streetlight LED retrofits.
- LED lighting retrofits.
- HVAC system upgrades.
- HVAC system controls.
- Boiler upgrades.

6.4 Key Takeaways

Energy management system will be an important part of tracking energy performance and providing key performance indicators (KPI) of energy efficiency projects moving forward. Energy management must be a part of the organization culture – providing appropriate training to staff can help facilitate this.

7.0 Summary

The ECDM plans reviewed had varying goals and strategies on how to achieve those goals. However, there were a number of common themes between them, which can be taken as best practices based on what the most energy efficient municipalities are doing.

The common strategies employed on an organizational level include:

- Creating a culture of energy conservation within the organization through a combination of providing the appropriate training to staff, and increased communication on energy initiatives.
- Designate a team which is responsible for upholding the goals and strategies defined in the ECDM plan.
- Develop policies and procedures related to energy efficiency in areas such as capital projects and procurement. Consider life cycle cost analyses for new equipment. Consider minimum energy efficiency standards for new buildings.
- Measure and track the energy consumption of facilities and performance of implemented ECMs.
- Ensure utility incentives (Enbridge, IESO) are taken advantage of when completing ECMs. This decreases capital costs, but also ensures estimated energy savings are documented.
- Completing energy audits on major buildings shortly before the ECDM plan is required to be updated.

The common strategies employed on a retrofit level include:

- Target the largest energy consuming end uses such as lighting, HVAC, and refrigeration.
- LED lighting retrofits in buildings typically have low payback periods and can be partially funded by incentives.
- LED street lighting retrofits should be considered.
- HVAC system controls optimization can have significant energy savings impact for a relatively low cost.
- Refrigeration plants typically have a number of potential ECMS which can have significant energy savings impact (e.g. floating head pressure controls. They should be thoroughly investigated so the opportunities can be defined.

Guidance on how to employ these strategies is outlined in the “Energy Conservation and Demand Management Plan Update 2019 – 2023”, “Sustainability Framework, and “Communication Strategy”.

Appendix C: Sustainability Framework

The Sustainability Framework is designed to provide direction on actions which should be taken in order for the Town of Aurora to help accomplish any future sustainability objectives. This document will be used in conjunction with the "Energy Conservation and Demand Management Plan Update 2019 – 2023" (ECDM plan) and "Communication Strategy".

This framework has not yet been adopted by the Town of Aurora but will be put into place in 2019 along with the ECDM plan and "Communication Strategy". Milestones 1 – 2 have been completed, and Milestone 3 has been partially completed as part of the ECDM plan.

The Steering Committee, led by the Energy and Climate Change Analyst and developed as part of the "Communication Strategy", will be responsible for upholding the Sustainability Framework. Their key role in the next five years will be to complete the remainder of Milestone 3, and Milestones 4 – 5.

Milestone 1: Create an energy and GHG emissions inventory and forecast

This inventory will be a baseline for which any future reductions will be measured against. This inventory includes all Town of Aurora owned facilities and fleet vehicles, and has been completed as part of the ECDM plan.

The forecast looks at the Town of Aurora's baseline energy consumption and GHG emissions, and examines what they would look like in the next five years if no actions are taken. Due to population growth, these values will likely increase significantly. An analysis on utility costs will be done to quantify the impact on the Town of Aurora's operating budget if no action is taken to reduce energy consumption and GHG emissions.

Milestone 2: Set reduction targets

This exercise has been completed as part of the ECDM plan. Corporate energy and GHG reduction goals have been set taking the following factors into account:

- Number of feasible energy conservation measures (ECMs) identified in energy audits completed for Town of Aurora facilities.
- Estimated budget to implement energy efficiency projects.
- Review of goals set by the most energy efficient municipalities in Ontario.

Milestone 3: Develop action plan

The ECDM plan identified ECMs and organizational strategies which should be implemented in the next five years in order to achieve the goals described in the plan. The action plan takes this one step further

and determines the years which these actions will be taken as well as the parties responsible for taking these actions.

Milestone 4: Implement action plan

Although planning is an important step in this framework, following through with implementation of ECMs and organizational strategies is equally important. The Town of Aurora will actively seek out financial incentives from the government and local utility providers to help implement actions defined in the action plan. Sufficient support from Senior Management/Council will be imperative to complete this milestone.

Milestone 5: Monitor progress and reporting results

Perhaps the most important step is to track the implementation of ECMs, and document the resulting energy consumption and GHG emissions reductions. The Town of Aurora identified this to be an area that could use significant improvement.

The Town of Aurora will employ the following strategies moving forward to track energy consumption and GHG reductions as a result of the completed ECMs:

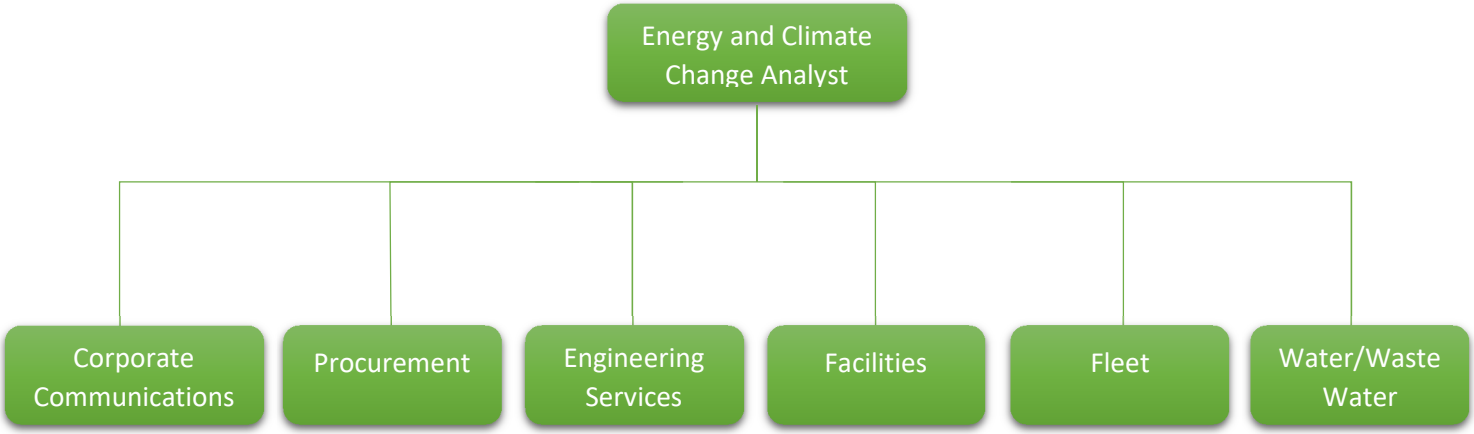
1. Complete ECMs based on recommendations from energy audits and engineering feasibility studies. These reports will have detailed estimates on energy consumption and GHG emissions savings as a result of implementing each ECM.
2. Leverage incentives from local utility distribution companies to implement ECMs. Estimates on energy savings are typically required to be eligible for these incentives. This will ensure energy savings are documented.
3. Energy and Climate Change Analyst will monitor hourly and monthly energy consumption of facilities before and after ECMs are implemented to estimate energy consumption and GHG emissions savings.

Appendix D: Communication Strategy

This Communication Strategy is designed to guide the Town of Aurora in the creation of a Steering Committee which will ensure the successful implementation of the "Energy Conservation and Demand Management Plan Update 2019 – 2023" (ECDM plan) and "Sustainability Framework".

This committee will meet on a quarterly basis to discuss work in progress and tracking towards the goals established in the ECDM plan.

The Steering Committee will be made up of individuals in the following roles:



The following table outlines some of the responsibilities of the Steering Committee in detail.

Member	Responsibilities
Energy and Climate Change Analyst	1. Oversee energy management within all facilities, and acts as a central resource and contact for energy efficiency matters. 2. Monitor and track energy use in Town of Aurora facilities. 3. Lead implementation of energy conservation measures (ECMs) identified in the ECDM plan and otherwise. 4. Facilitate implementation of staff training programs and employee engagement strategies.
Water/Waste Water Supervisor	1. Assist with monitoring and tracking of energy consumption. 2. Request input from Steering Committee Lead on decisions which may have energy impact.

	3. Advise Energy and Climate Change Analyston strategies to reduce energy consumption and GHG emissions. 4. Assist Energy and Climate Change Analyst with implementation of ECMs.
Fleet Supervisor	1. Assist with monitoring and tracking of energy consumption. 2. Request input from Steering Committee Lead on decisions which may have energy impact. 3. Advise Energy and Climate Change Analyst on strategies to reduce energy consumption and GHG emissions. 4. Assist Energy and Climate Change Analyst with implementation of ECMs. 5. Assist with implementation of anti-idling policy. 6. Assist with implementation of driver training program.
Facilities Manager	1. Assist with monitoring and tracking of energy consumption. 2. Request input from Steering Committee Lead on decisions which may have energy impact. 3. Advise Energy and Climate Change Analyst on strategies to reduce energy consumption and GHG emissions. 4. Assist Energy and Climate Change Analyst with implementation of ECMs.
Engineering and Capital Delivery Manager	1. Request input from Steering Committee Lead on decisions which may have energy impact. 2. Advise Energy and Climate Change Analyst on strategies to reduce energy consumption and GHG emissions. 3. Assist Energy and Climate Change Analyst with implementation of ECMs. 4. Assist with development of energy efficiency oriented procurement policies.
Procurement Manager	1. Assist with development of energy efficiency oriented procurement policies.
Corporate Communications Manager	1. Assist with improving communication of energy efficiency initiatives within the organization. 2. Assist with implementing staff engagement strategies.

Organizational strategies for the Steering Committee to consider for the next five years are:

1. ECM implementation
    a. Formalize criteria and metrics for prioritizing energy efficiency projects. This should take into account life-cycle costs, available incentives, impact on occupant comfort, regulatory requirements, ease of implementation, and energy savings impact.

2. Organization energy policies
    a. Develop guidelines and policies for energy management to be followed by all Town of Aurora facilities.

3. New buildings/equipment
    a. Develop minimum energy efficiency requirements for equipment replacement and new equipment.
    b. Develop formal guidelines for considering energy at all stages of new building design.
    c. Develop procurement policies which favours life cycle costs over lowest first costs.
    d. Ensure all new buildings and equipment are properly commissioned.

4. Energy management
    a. Investigate potential to adopt an energy management system to monitor and analyze energy consumption across Town of Aurora facilities.
    b. Formalize methodology to monitor and track progress of ECMs.
    c. Create annual report documentation progress of energy efficiency initiatives.

5. Training
    a. Provide general training on energy efficiency for operation and maintenance (O&M) staff.
    b. Provide targeted training for O&M staff as needed.
    c. Energy and Climate Change Analyst (and other staff as required) to keep up to date on industry trends and best practices.

6. Internal communication/staff engagement
    a. Improve communication of energy initiatives to staff and public.
    b. Develop staff engagement strategy to encourage a corporate culture of sustainability.
    c. Host online suggestion box/survey for staff to provide commentary on potential energy efficiency opportunities.

7. External communication/public engagement
    a. Hosting public engagement sessions to educate residents on energy efficiency initiatives being undertaken at the Town of Aurora (e.g. speaker series).
    b. Town of Aurora staff to attend public events (e.g. trade shows, expos) as networking and knowledge sharing opportunities with other organizations and municipalities.
    c. Leverage social media channels and Town of Aurora website to advertise successes of energy efficiency initiatives.
    d. Host online suggestion box/survey for residents to provide commentary on potential energy efficiency opportunities.