



OAKVILLE

2020 Energy Conservation and Demand Management Plan

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And, the Sustainability and Government Relations department

With assistance from Posterity Group

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Independent Electricity Systems Operator (IESO)

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1.0 Executive summary

As a growing lakeside community of 211,000 in Southern Ontario's Greater Golden Horseshoe, the Town of Oakville has a demonstrated longstanding commitment to sustainability. Wise use of energy resources is strongly supported and embedded in the town's strategic plan and is supported by town Council and senior management. This corporate commitment ensures continued progress towards sustainability and building a corporate culture of conservation.

Oakville's 2020 Energy Conservation and Demand Management plan (2020 CDM Plan) is prepared in compliance with Ontario Regulation 507/18 (O. Reg. 507/18) under the *Electricity Act 1998*. As per the Ministry of Energy, Northern Development and Mines, municipalities are required to submit annual reports of energy consumption and greenhouse gas (GHG) emissions as well as a five-year energy conservation and demand management plan. The town's 2020 CDM Plan provides a comprehensive framework for energy conservation and management at town facilities, parks and street and road infrastructure. It also summarizes the status of energy conservation at town facilities for the past five years, lists results of the town's 2014 CDM Plan and highlights renewable energy initiatives.

The 2014 CDM Plan was the town's first plan and focused on four key goals with 16 objectives and 58 actions centred on Corporate commitment, Energy data and management processes, Capital asset management systems and Leadership in energy and GHG emissions management. The overall mission was to achieve a 15 per cent reduction from the 2012 baseline energy consumption by 2019. By 2017, the town achieved an overall reduction of energy use of 9.33 per cent and the projected reduction by 2019 is estimated to be 7.25 per cent. Although the town did not fully achieve the energy reduction goal, many of the objectives and actions were completed. As the town moves forward to our 2020 CDM plan, we are ready to build on the success of the current plan and meet the challenges of the upcoming five years.

The 2020 CDM Plan reaffirms the town's vision to be the most livable town in Canada and our commitment to the Oakville community. Building on the foundational work from the 2014 CDM plan, the focus of the new plan has been intentionally narrowed to achieve two goals: a 20 per cent reduction in overall energy consumption and a 30 per cent reduction in GHG emissions. Achieving both goals by 2024 is critical to meeting council's long term goal of a corporate GHG emission reduction of 80 per cent below 2014 levels by 2050.

There are **six areas of focus** that support the two goals: Conservation; Standard operating procedures; Retro-commissioning; Capital planning and projects; Measurement and verification; and, Communications and training. Each of the areas of focus have accompanying **actions** that taken together will provide a governance structure to facilitate planning, collaboration, implementation, progress verification and continuous improvement for energy management at the town. Similar to the 2014 CDM Plan, the new plan will provide the tools we need to carry us forward to 2050.

2.0 Commitment to energy conservation and the environment

Oakville's strong commitment to energy conservation and the environment is longstanding and is supported by a number of documents that are available publicly. These include:

- Livable Oakville - Official Plan
- Vision 2057 - Sustainable Community Framework
- Council's Strategic Plan
- Environmental Sustainability Policy and Plans
- Partners for Climate Protection Program – Milestone targets and achievements
- Halton Partners for Clean Air, Resolution submitted May 14 2005
- Global Covenant of Mayors for Climate and Energy and commitment to completing the four badge Compact of Mayors Program
- Sustainable Design Guidelines
- Sustainable Building Design Procedure
- Sustainable Green Fleet Procedure
- Sustainable Purchasing Procedure
- 2014 Conservation and Demand Management Plan

Vision for 2050

In 2015, town Council adopted the following short and long-term GHG emissions targets for corporate operations:

- **Long-Term:** GHG emission reduction of 80 per cent below 2014 levels by 2050
- **Short-Term:** Greenhouse gas per capita emission reduction of 20 per cent below 2014 levels by 2030
- **Short-Term Sub-Targets:**
 - 30 per cent per capita reduction in building emissions from 2014 levels by 2030;
 - 10 per cent per capita in fleet emissions from 2014 levels by 2030; and
 - 40 per cent per capita reduction in streetlight emissions from 2014 levels by 2030.

The town is currently finalizing a new Corporate Energy Policy that is critical to achieving the 2050 targets. The policy formalizes the town's commitment to public accountability, to adopting clear objectives for energy conservation and developing supporting operational procedures and processes. The Corporate Energy Policy is intended to be a vehicle to fully shift the town's cultural emphasis towards sustained energy management. The 2020 CDM Plan will form the strategy for implementing the policy.

3.0 Provincial Legislation and Oakville's Compliance

The 2020 CDM Plan is being prepared in compliance with Ontario Regulation 507/18 (O.Reg. 507/18) under the *Electricity Act 1998*. According to the regulation, the Town of Oakville is required to develop and publish a plan to implement energy conservation and demand management initiatives over a five year period.

The CDM Plan includes:

- A summary of the town's annual energy consumption and greenhouse gas emissions for its operations.
- A description of previous, current and proposed measures for conserving and otherwise reducing the amount of energy consumed by the town's operations and for managing our demand for energy. Description to include a forecast of the expected results of current and proposed measures.

The 2020 CDM Plan is not new; it is intended to build on the successes realized in the 2014 CDM Plan. In accordance with the regulation, the CDM plan presents revised energy use forecasts based on ongoing and new energy conservation measures; reports on results achieved; and, describes the measures to be taken throughout the next five years.

The Town of Oakville has been reporting its annual energy consumption and GHG emissions to the Ministry of Energy, Northern Development and Mines, as per O.Reg. 507/18. All previous reports as well as this year's report and the 2020 CDM Plan are posted to the Town of Oakville's website and are made available to the public at the [town's dashboard](#).

4.0 2017 Annual Energy Use, Cost and GHG Emissions

O.Reg. 507/18 requires all Broader Public Sector institutions to report on their energy use. The graphs and tables presented in this section provide information on the town’s energy use, costs and GHG emissions for 2017, the latest year for which energy information was reported to the Ministry. This information will be used in projecting savings to the end of the current CDM planning interval (2019) as well as form the basis for projections for the 2020 CDM Plan.

As of 2017, the town operated 51 buildings totaling 1,744,084 square feet. The town also operated 16,500 streetlights, 16 splash pads, 38 parks with a range of amenities (including seasonal parks buildings), parking meters and other outdoor infrastructure. In 2017, the town spent \$7,953,806 in utilities and had scope one and two emissions of 6,497 tonnes of carbon dioxide equivalent (CO_{2e}). Table 1 presents a summary of the energy use, cost and emissions for each category of infrastructure supported by the town.

Table 1: 2017 Energy Use, Cost and GHG Emissions

Energy source	Energy use (ekWh)	Cost (\$)	GHG emissions (tonnes CO _{2e})
Corporate buildings (electricity)	28,107,561	\$5,032,270	562
Corporate buildings (natural gas)	31,960,946	\$860,926	5,677
Streetlights (electricity)	5,190,942	\$1,710,635	104
Traffic lights (electricity)	551,900	\$100,564	11
Outdoor use (electricity)	1,020,763	\$230,647	20
Outdoor use (natural gas)	692,241	18,764	123
Total	67,524,353	\$7,953,806	6,497

Figures 1, 2 and 3 illustrate the distribution of cost, consumption and emissions for each category and provide insight as to where the town is using energy, what type of energy is more expensive and which operation produces more GHG emissions. As shown on Figure 1, electricity use in corporate buildings is the most expensive utility, representing more than 63 per cent of the total expenditure in utilities. However, from an energy use perspective, electricity use in buildings represented only 42 per cent of the total energy used and generated only 9 per cent of total GHG emissions. On the other hand, natural gas used in buildings is by far the least expensive utility representing 11 per cent of total expenditures yet it provides 47 per cent of total energy use at town’s facilities and generates 87 per cent of total GHG emissions.

The analysis above indicates some critical tensions and constraints between the town’s energy conservation goals and GHG emissions reduction goals:

- Achieving the 2050 GHG emissions reduction targets requires significantly reducing use of natural gas in town buildings. Considering only reduction in GHG emissions, further electrification of the town’s energy infrastructure would be the most effective strategy to follow. This strategy does not consider fiscal responsibility as the cost of electricity currently far exceeds natural gas.
- In addition, reaching the town’s energy conservation goals requires reducing both natural gas and electricity use in buildings, as they both represent approximately half of the energy use.

Although it seems like the requirements above are in opposition to one another, the overall picture outlines the importance of an aggressive, holistic energy conservation and demand management approach that tackles reductions in both electricity and natural gas, while looking for alternatives to provide energy to the town’s facilities and infrastructure in a reliable and cost-effective manner.

Figure 1: 2017 Annual utility costs (\$)

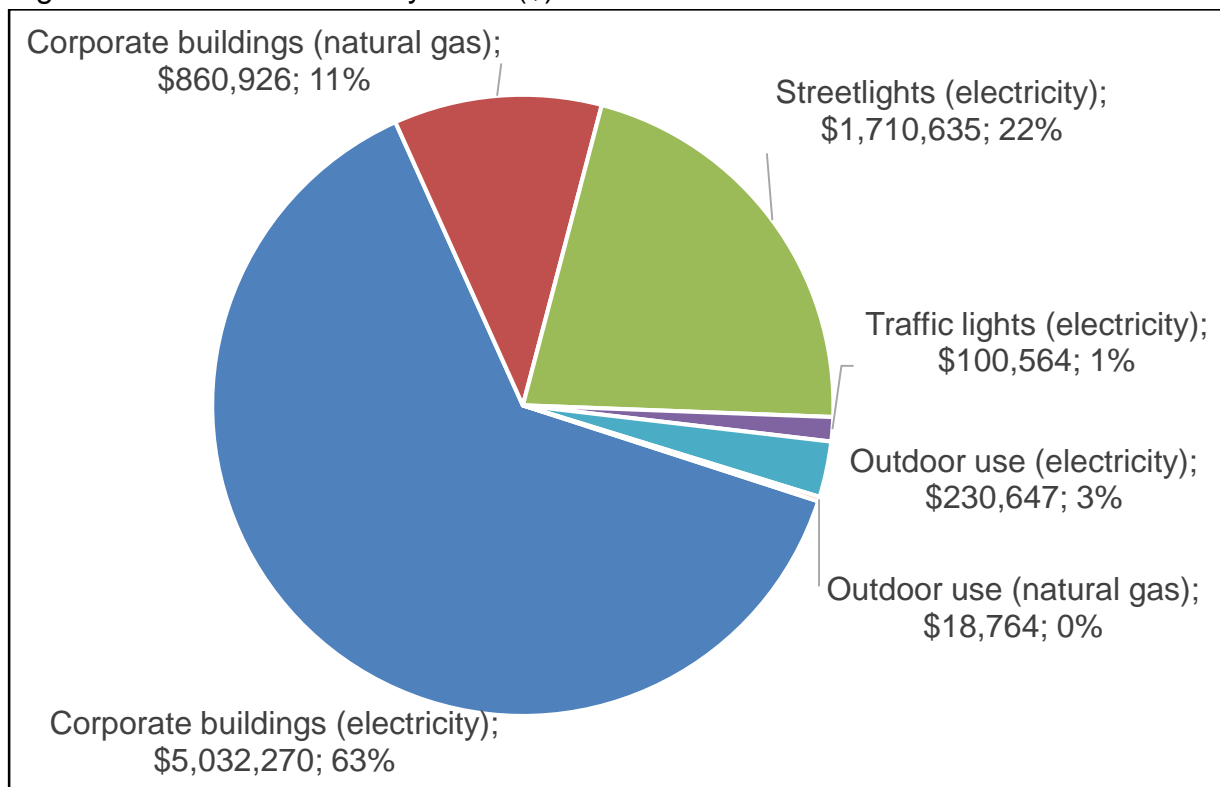


Figure 2: 2017 Annual energy consumption (ekWh)

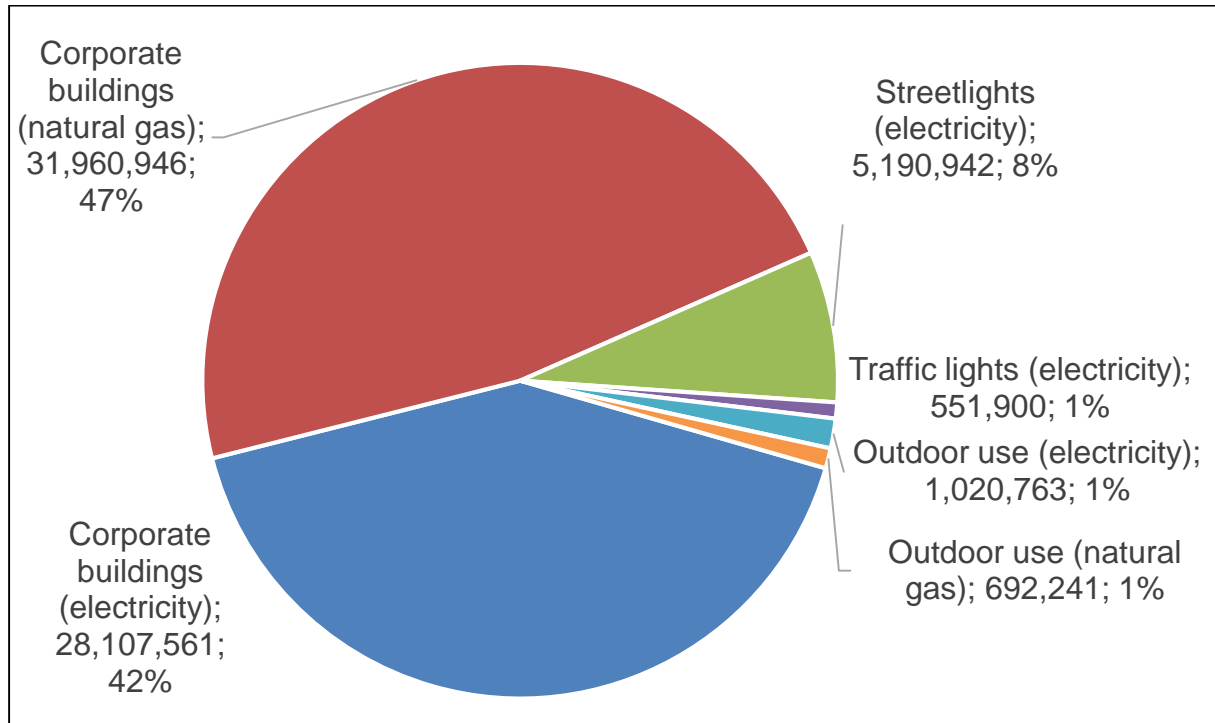
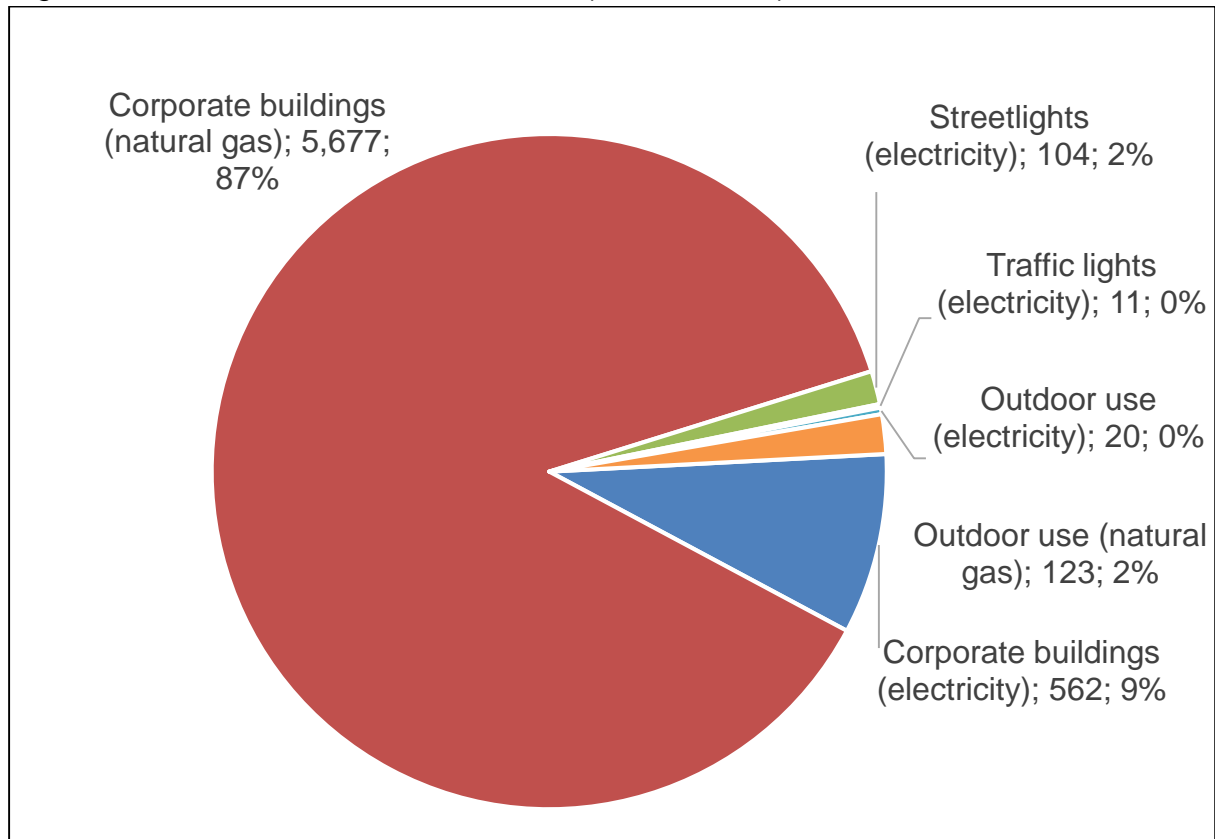


Figure 3: 2017 Annual GHG emissions (tonnes CO₂e)



5.0 Review of the 2014 CDM Plan

5.1 2014 CDM Plan: Vision and Mission

Vision: To become a leader in corporate energy management

Mission: To achieve a 15 per cent reduction from the 2012 baseline energy consumption by 2019.

Energy Use

Although not fully realized, significant progress has been made towards achieving the mission statement of the current CDM plan. Using 2012 as baseline data, Table 2 and Figure 4 illustrate a reduction in overall energy use of 9.3 per cent for year-end 2017 and forecasts a total 7.5 per cent reduction in energy use by end of 2019.

Table 2: Total energy use from 2012 to 2017

	2012 (Baseline)	2017	2019*	2017 vs 2012 (per cent)	2019 vs. 2012* (per cent)
Energy use (ekWh)	74,470,226	67,524,353	69,069,473	-9.33	-7.25
Energy cost (\$)	\$6,483,048	\$7,953,806	\$7,410,161	22.69	14.30
Energy cost per unit (\$/ekWh)	\$0.09	\$0.12	\$0.11	33.33	22.22

* Estimates

Figure 4: Annual energy use (ekWh), 2012 - 2019

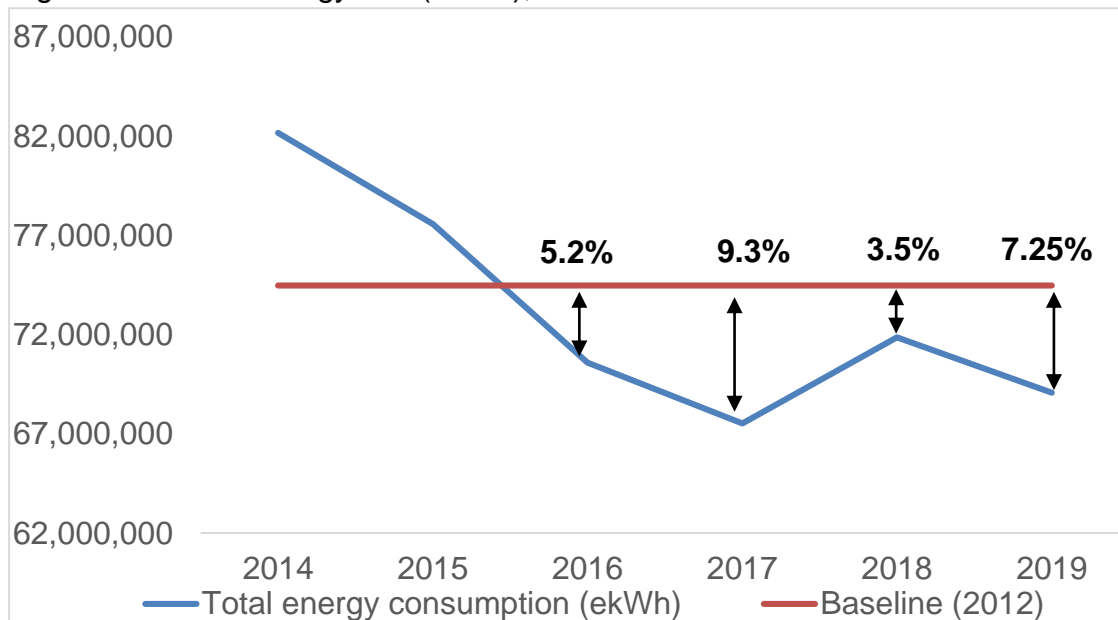


Figure 4 illustrates how energy consumption has varied during the past five years. Given that natural gas makes up for more than half of the energy consumption at our facilities, any significant changes in weather – particularly during the winter - greatly impact our performance.

Although several capital projects and initiatives were undertaken to reduce energy consumption at town facilities over the past few years, we still fell short of the 15 per cent reduction target for 2019. Being the first time the town underwent energy conservation planning of this magnitude, the past five years were focused on planning and developing the capacity to implement future initiatives while also moving forward with smaller, cost-effective measures.

From an organizational perspective, it is typical to start with projects that have a short return on investment and are easily realized. Over the past five years, the town has completed numerous lighting retrofits that provide for quick wins that showcase the potential of energy conservation. As a result of this focus, retrofits to other building systems with potentially higher savings were left for future planning cycles.

As seen in Figure 2, although natural gas is inexpensive compared to electricity, the impact it has on energy use is considerable and in fact comparable to electricity use. Given that most of the focus of the town's energy conservation measures was on electricity (and lighting retrofits) only a handful of projects addressed natural gas consumption. Natural gas has a very high energy content and an initiative that looks at reducing natural gas use in a facility can have a higher impact on overall energy consumption than a lighting retrofit.

Over the next five years, **the focus will shift towards undertaking a variety of projects with a balanced approach between electricity and natural gas-related retrofits**, in order to ensure that energy use, cost and GHG emissions are consistently reduced.

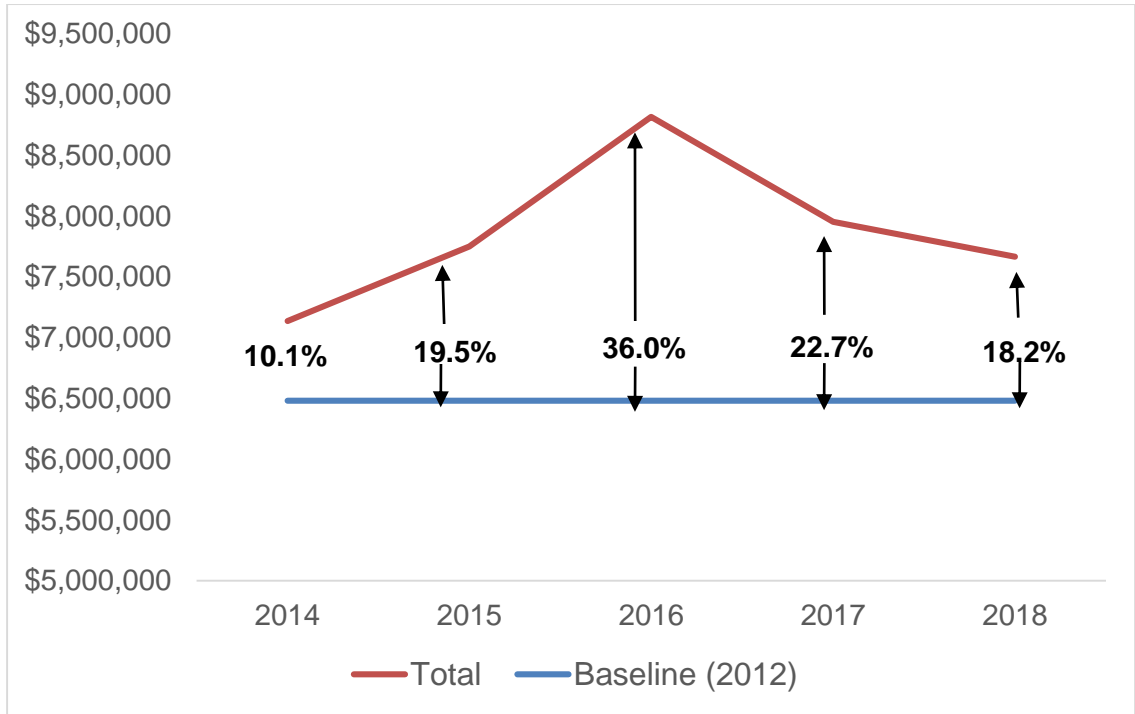
Energy Cost

Figure 5 provides a different insight into the performance of the town's facilities. Even with a 9.3 per cent decrease in energy consumption by 2017, total costs for energy use rose considerably resulting in a 36 per cent increase in total costs. One of the main reasons for the increase in electricity costs over the past few years is the growth of the Global Adjustment (GA) charges in Ontario which represents the cost of construction and supply of new electricity infrastructure in the province. The value of the GA in 2012 reached \$6.4 billion and increased to \$11.8 billion by 2018, almost doubling in value. Although the increase in the GA did not lead to a comparable increase in town costs in recent years, it certainly had an impact on the overall electricity rates paid by the town.

The other main driver in cost increase is the change in how the Ontario Energy Board sets the rules for Local Distribution Companies (LDC) to determine the connection charges for streetlights. The cost of a kWh of electricity has grown from 19 cents in 2012 to 35 cents in 2018, mainly driven by this connection charge. The peak in the cost of electricity shown in

Figure 5 in 2016 is directly related to the change. This has resulted in a doubling of the percentage increase over one year and a 36 per cent increase compared to the 2012 baseline. Had the town not implemented the LED streetlight retrofit project, the increase in energy costs would have continued the sharp upward slope rather than the decrease shown in 2017 and 2018. Refer to section 5.3 for a detailed analysis of the streetlight retrofit project.

Figure 5: Annual energy costs (\$), 2012 - 2018



5.2 2014 CDM Plan: Goals and Objectives

Along with a mission to reduce energy use by 15 per cent, the 2014 CDM Plan listed 4 key goals centred on: Corporate commitment; Energy data and management processes; Capital asset management systems; and, Leadership in energy and GHG emissions management. These goals were supported by 16 objectives and 58 actions, including a combination of technical organizational and engagement initiatives. To date, the town has completed seven of the 16 objectives, with six more underway and three are on hold. The goals and objectives are summarized below along with the actions. Where energy savings could be determined, they are indicated.

Goal 1: Foster a corporate commitment to energy efficiency

Objective 1.1: Implement a targeted energy training program for management and staff

Status: Complete

- In collaboration with Seneca College, managers from 10 town facilities participated in a pilot program (Energy Reporting and Coaching Pilot) from 2015 – 2017. As part of the program, facility managers received monthly energy performance data reports on their facilities' to help them identify operational anomalies.
- In 2017 and 2018, 28 operation's staff took part in the Energy Efficient Building Operations Training 101 Workshop. The training provided building operators with the tools to understand energy conservation, to help find energy savings opportunities and to actively engage with energy conservation at the town's facilities.

Objective 1.2: Develop a Corporate Energy Policy and procedures

Status: In Progress

- The town's Corporate Energy Policy is expected to be completed by the end of 2019 and approved by Council in early 2020.

Objective 1.3: Evaluate need for an Energy Manager position

Status: Complete

- In August 2017, the town created the position of Energy Solutions Manager to lead and implements energy conservation efforts, streamline energy data management, develop standards and guidelines for energy efficiency in corporate facilities and engage staff to maintain the impact of energy conservation measures.
- As of the last report sent to the IESO (Independent Electricity Systems Operator) in late 2018, energy management efforts driven through the Energy Solutions Manager has contributed to annual energy savings of 3,322 MWh thanks to the implementation of a series of energy conservation measures. This amount of savings has surpassed the commitment that the Town of Oakville undertook through the SaveOn Energy Embedded Energy Manager program.

Goal 2: Improve energy data and management processes

Objective 2.1: Procure energy management software for town facilities

Status: In progress

- In 2018, the town invested in a new Johnson Controls Enterprise Management System (JEMS), a web-based service that proactively analyzes building energy and equipment data to identify issues, faults and opportunities for improved performance and operational savings.

Objective 2.2: Track energy consumption to reduce energy demand and costs

Status: Complete

- Energy consumption information for all buildings and infrastructure is compiled on an annual basis and used in capital and operations planning.

Objective 2.3: Develop and implement Standard Operating Procedures

Status: On Hold

- The town is currently undergoing a review of its facilities operations. Once the review is complete, Standard Operating Procedures will be developed and implemented.

Objective 2.4: Improve Building Automation Systems

Status: In progress

- The town's Building Automation System (BAS) has been expanded and modernized in order to capture and analyze energy data for our largest facilities. Data provided will help mitigate operational inefficiencies and inform future capital projects.

Goal 3: Improve capital asset systems to reduce energy use and cost

Objective 3.1: Implement 10-Year LED Conversion Plan for Streetlights

Status: Complete

Achieved Savings: 4,600 eMWh, \$1.7 million

- As of year-end 2017, the town completed the conversion of more than half of its streetlights, with the remainder complete by end of 2018. Original estimates in cost and energy savings were surpassed and an in-depth analysis on this project is presented in the next section.

Objective 3.2: Improve and update corporate energy management inventories

Status: Complete

- By leveraging the asset management program, the town has implemented a robust preventive maintenance program along with a capital replacement program focused on energy efficient mechanical and building system upgrades.

Objective 3.3: Implement energy improvement and audit recommendations

Status: In Progress

Achieved Savings: 1,054 eMWh annually

Cost avoidance: \$225,000 annually

- By 2017, the town had implemented 17 energy conservation measures in various buildings. A full list of measures is presented section 5.3.

Objective 3.4: Develop and ongoing auditing schedule for facilities

Status: On Hold

- The town prepared energy audits for the top 10 facilities and implemented several initiatives (see Table 3). For the next five year cycle, the town will be conducting a targeted deep retro-commissioning program rather than performing energy audits.

Goal 4: Demonstrate leadership in energy and GHGe management

Objective 4.1: Annually Evaluate and Report on CDM Implementation

Status: Complete

- An annual report on performance on our energy consumption was prepared up until 2017. The reports will continue being prepared with the 2020 CDM Plan.

Objective 4.2: Create a public consultation and education strategy

Status: In Progress

- A pilot program for educating and engaging the public on town energy conservation and demand management strategies was deployed across some town facilities. Success of the engagement strategy is under review and will help develop the 2020 CDM Plan.

Objective 4.3: Develop a Community Energy Plan

Status: In Progress

- The town is currently working with several internal and external stakeholders to develop the Community Energy Plan.

Objective 4.4: Adopt best energy management practices and systems

Status: Complete

- All major capital projects at the town have a Leadership in Energy and Environmental Design (LEED®) Silver certification target. We currently have four certified buildings with one more under review and two more scheduled for completion in 2020.

Objective 4.5: Integrate CDM with the Partners for Climate Protection GHGe Reduction plan

Status: On Hold

- This objective will be tackled through the 2020 CDM Plan.

5.3 2014 CDM Plan: Success Stories

2016 Streetlight LED retrofit project

The town owns a network of 16,500 streetlights for illuminating its road and sidewalk system. In 2015, a two phase 10-year LED streetlight conversion program was developed and approved as part of the capital budget process for a total capital cost of \$12.6 million over 2016 and 2017. The project was completed in 2018 with 15,900 fixtures replaced to LED standards. Working in collaboration with Oakville Hydro, the town was able to secure incentives of \$865,000 for the project and the capital cost was reduced to \$11.7 million.

Figure 6 represents the energy savings resulting from the project. Comparing a business as usual (BAU) versus the retrofits that were implemented, the retrofit project has yielded savings between 1,500 to 6,000 MWh on an annual basis. As of 2018, the project yielded a reduction in energy consumption of 60 per cent compared to BAU and achieved 48 per cent of energy savings compared to the 2012 baseline. The projected results for 2019 yield annual savings of 6,000 MWh which represents a 60 per cent reduction compared to baseline 2012 consumption.

Figure 6: Energy consumption of streetlights, business as usual vs. retrofit scenarios

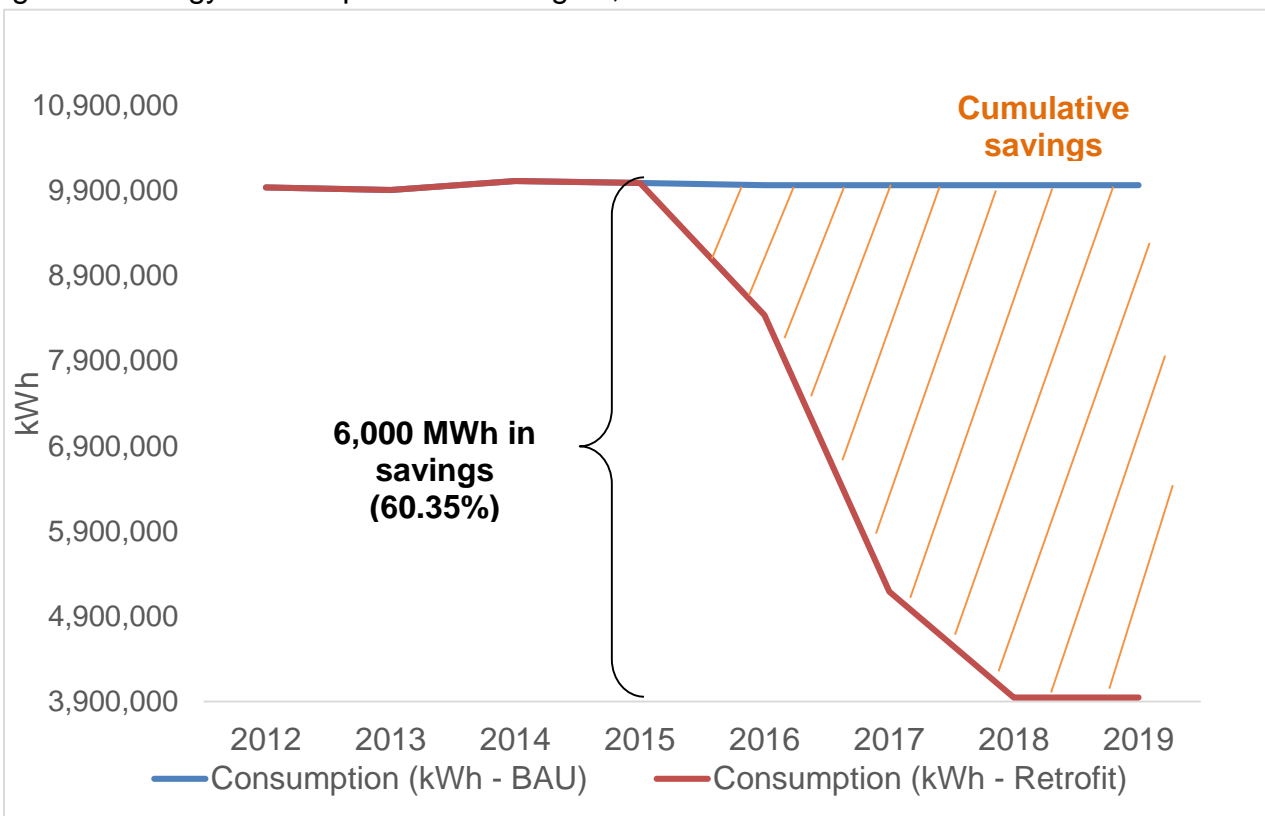
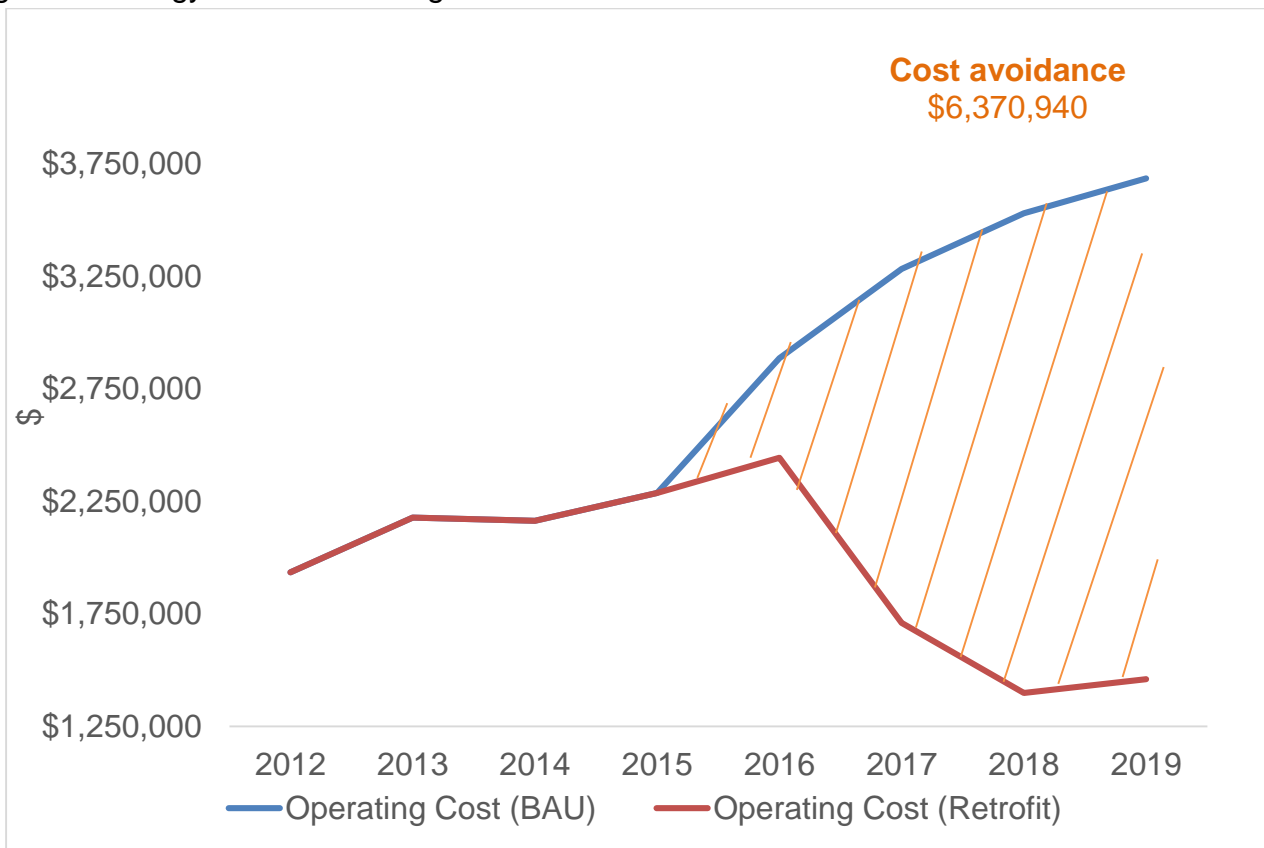


Figure 7 presents the cost avoidance achieved through the implementation of the retrofit project. By 2017, the cost avoidance represented \$1.5 million or 19 per cent less than 2012 BAU cost. Based on projections, the project will have avoided costs of \$6.3 million from 2016 to 2019.

Figure 7: Energy costs of streetlights for business as usual vs. retrofit scenarios



Even with a 60 per cent decrease in energy use, the cost avoidance did not reach a comparable level over the same period. As mentioned in section 5.1, the growth of the GA charges and the increase in connection charges both had a significant impact on the energy cost for streetlights in particular. Connection charges represent a large portion of the total energy cost of a streetlight; meaning that any significant increase in these charges will have a notable impact on total costs associated with this category.

Other energy conservation projects at town facilities

In addition to the streetlight retrofit project, the town completed 18 energy conservation projects over the past five years. The projects were identified by energy audits conducted at the town’s top 10 consuming facilities. Projects were evaluated against various technical criteria, financial viability, end of equipment life, ease of replacement and potential for impact on facility operations during the project. The majority of the projects are lighting retrofits as they are very cost effective and have a short ROI. In addition, despite providing relatively modest energy savings, they have immediate identifiable results with enhanced interior lighting quality and increased occupant comfort. In addition, LED lighting retrofits reduce heat gain generated from the lamps which in turn reduces the need to cool spaces. Refer to Table 3 for annual saving in kWh, cumulative savings (\$) and incentives (\$) realized through the IESO’s SaveOn Energy program.

Table 3: Energy conservation projects from 2016 to 2018

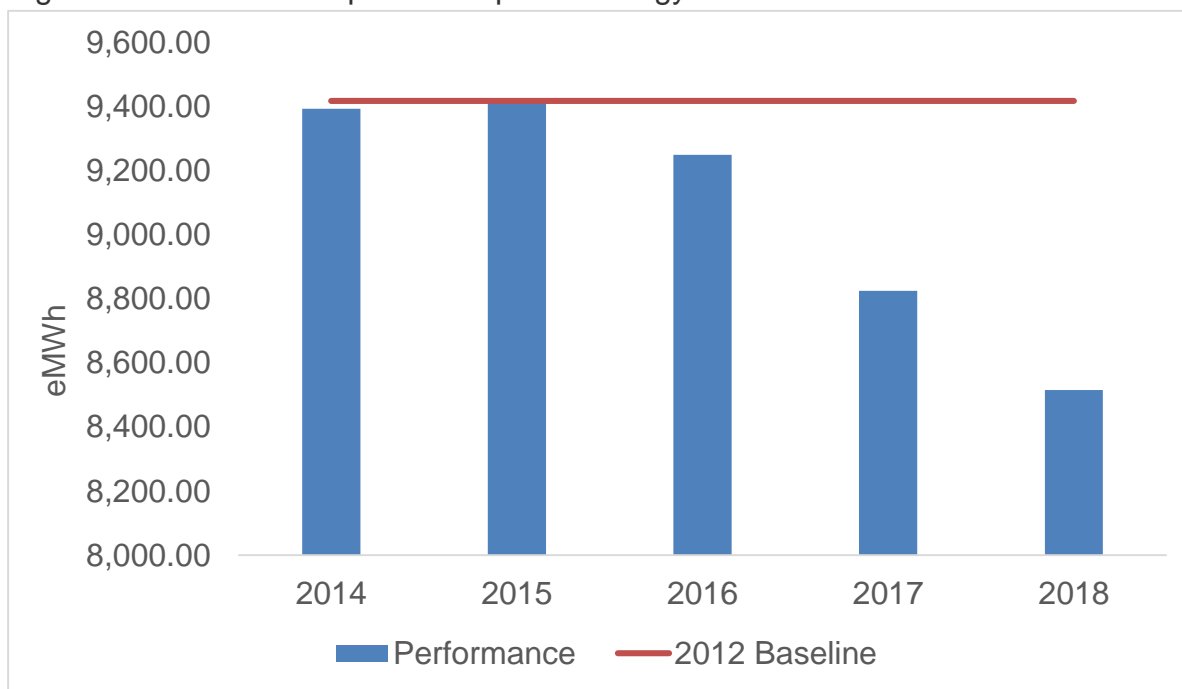
Project	Year	Annual savings kWh)	Cumulative cost avoidance(\$)	Incentives (\$)
Chiller Replacement - 130 Navy	2016	7,500	\$2,616	\$8,160
Joshua's Creek - controls	2016	64,323	\$22,437	\$6,433
River Oaks - RTU replacement	2016	3,333	\$1,163	\$5,690
Woodside Library - RTU replacement	2016	1,818	\$634	\$2,640
Operations building - exterior lighting	2017	65,835	\$22,964	\$5,631
Transit facility - RTU replacement	2016	10,936	\$3,815	\$4,400
Park - exterior lighting	2017	8,757	\$3,055	\$750
16 Mile Creek Sports Complex - VFD	2017	29,542	\$10,305	\$5,785
Fire Services - lighting	2017	28,975	\$9,674	\$2,176
300 Church St - lighting	2017	174,194	\$45,159	\$13,266
Kinoak Arena - lighting	2017	6,406	\$1,756	\$1,200
Joshua's Creek Arena - lighting	2017	28,885	\$7,488	\$1,716
QEPCCC pool - lighting	2017	30,956	\$7,563	\$1,779
Glen Abbey CC - lighting	2017	28,904	\$6,199	\$2,050
QEPCCC - exterior lighting	2017	5,200	\$1,270	\$260
16 Mile Sports Complex - lighting	2017	310,000	\$57,227	\$16,956
Theatre lights OPAC	2017	26,877	\$5,363	\$3,400
Operations building - lighting	2018	221,968	\$15,693	\$23,322
TOTAL		1,054,409	\$224,379	\$105,614

Sixteen Mile Sports Complex – a case for holistic energy management

Between 2016 and 2017, the town implemented a series of energy conservation initiatives at the Sixteen Mile Sports Complex. The results of which are illustrated in Figure 8, with energy use consistently decreasing since 2016 and achieving an overall 9.6 per cent savings in 2018 when compared to the 2012 baseline.

Sixteen Mile is one of the town’s success stories with respect to energy conservation and provides a good case study for a holistic and comprehensive energy management strategy. The lighting retrofit and equipment replacement projects were complemented by conservation efforts, communication and training, benchmarking and commissioning which resulted in sustained energy reductions year over year.

Figure 8. Sixteen Mile Sports Complex – energy use



LEED® Certification

The town currently has four LEED® certified buildings, one project tracking to LEED® Silver certification and two more in construction as of 2019. All buildings target optimized energy and water performance as well as the use of regionally sourced materials with recycled content and low-emitting construction materials.

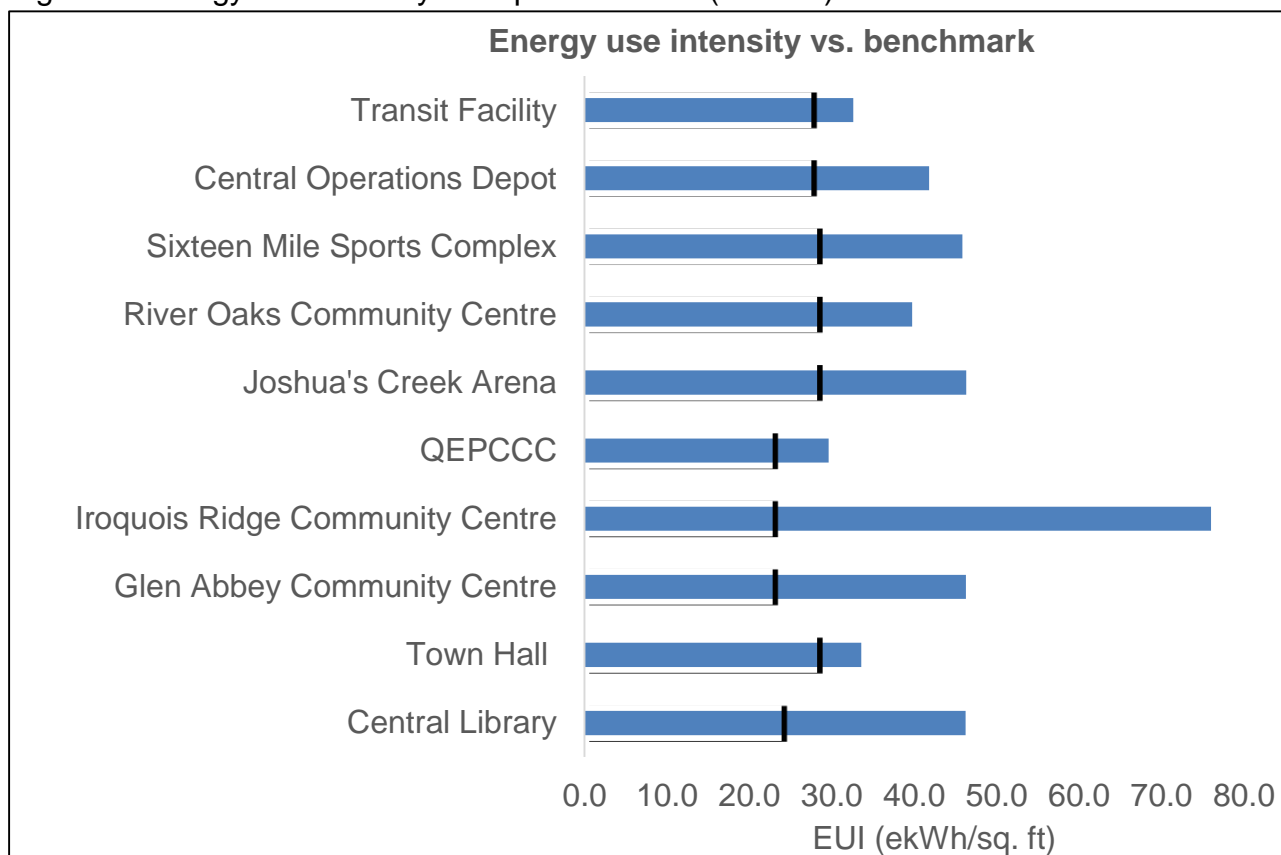
- *Oakville Transit (LEED® Silver)*. The 266,000 square foot facility is home to the Oakville Transit operations and houses the town’s first geothermal heat pump (GHP) system. The GHP system uses the ground as a source of energy for heating indoor air during the winter and cooling during the summer and has a capacity of 120 tons of clean energy (equivalent to 420 kW).

- *North Operations Depot (LEED® Silver)*. The 10,714 square feet facility is home to three town departments: the Roads and Works Operations, Parks and Open Space and Fire Station 9.5.
- *Sixteen Mile Sports Complex (LEED® Gold)*. The 185,690 square feet facility includes one Olympic-size ice pad, three NHL-size ice pads, change rooms, community rooms, shooter pads and a full-service restaurant. The facility is equipped with a rooftop solar PV system producing 458 kW (2,104 panels) which captures energy from the sun and transforms it into electricity.
- *Queen Elizabeth Park Community and Cultural Centre (LEED® Silver)*. The 145,760 square feet facility was an adaptive re-use of an old high school purchased by the town. It provides various cultural and community spaces including an aquatics centre, a fitness centre, two gymnasiums, a rock climbing wall, a youth centre, an older adults centre, dance studios, a recording studio, a fine arts studio, a rehearsal hall, a black box theatre, galleries, museum space and other public facilities.
- *Trafalgar Park Community Centre and Fire Station 3 (Targeting LEED® Silver)*. The project revitalized the old Oakville Arena site and includes a restoration of the heritage arena structure into an NHL size rink, a new community centre and Fire Station 3. Based on the energy model, the project is expected to achieve energy savings of 450,000 kWh on an annual basis, which represents a 35 per cent decrease compared to a traditional building.
- *Southeast Community Centre (Targeting LEED® Silver)*. The 54,000 square feet facility will house a 25 meter 6-lane pool, a therapeutic pool, public meeting spaces, community meeting rooms and a NBA full size gymnasium. Construction is scheduled to be completed in 2020 and will include a 225 kW solar PV system and a GHP plant. The building is expected to achieve energy savings of 24 per cent over a traditional building.
- *Fire Station 8 (Targeting LEED® Silver)*. The 11,000 square feet facility will serve north-west Oakville and includes a 60kW solar PV system. The building is expected to achieve energy savings of 20 per cent over a traditional building.

5.4 Energy Benchmarking

An important aspect of energy conservation and demand management is the use of energy benchmark data as it allows us to assess how the town’s buildings are performing in comparison with similar buildings in other municipalities. Figure 9 illustrates energy use intensity at our top 10 facilities compared against the 2016 benchmark established by the Association of Municipalities of Ontario study (*Energy Performance Benchmarking of Ontario’s Municipal Sector*). The study provides an in-depth picture of the current status of energy management in Ontario communities.

Figure 9. Energy use intensity for top 10 facilities (in 2016)



As can be seen, all of the town’s 10 facilities are performing at a higher energy use intensity (EUI) than the comparable 2016 benchmark. Taken at face value, the figure seems to indicate a potential reduction in total energy use of almost 18,000,000 kWh or 21.8 per cent of total corporate energy use, if the town’s facilities were to meet the benchmark. This is a misinterpretation of the information, as a benchmark considers the average energy use intensity on a large number of buildings and focuses on the type of operation rather on the size of the building. You cannot derive direct savings from such a comparison; yet it is useful in illustrating opportunities for energy conservation. For the 2020 CDM Plan, town staff will be reviewing the data and developing strategies and targeted efforts to bring down consumption in these facilities.

6.0 Energy and demand management at the town – 2020 to 2024

Oakville's 2020 CDM Plan is prepared in compliance with Ontario Regulation 507/18 (O. Reg. 507/18) under the *Electricity Act 1998*. As per the Ministry of Energy, Northern Development and Mines, municipalities are required to submit annual reports of energy consumption and greenhouse gas (GHG) emissions as well as a five-year Energy Conservation and Demand Management Plan.

The 2020 CDM Plan is a collaborative effort between the Facilities and Construction Management (FCM) department and the Sustainability and Government Relations division. In order to develop the 2020 CDM Plan town staff have:

- Reviewed and compiled industry best practices around energy conservation and demand management;
- Conducted external consultations with other municipalities and broader public sector institutions;
- Conducted internal interviews with staff from several departments including FCM Capital Projects, FCM Facilities Operations, Sustainability and Government Relations, Parks and Open Spaces and Finance. Interview topics ranged from success stories, effectiveness of behavioural and operational programs, financial strategy and grant opportunities, effectiveness of state of good repair program in achieving energy conservation and strategies to achieve long term goals;
- Performed detailed analyses on energy consumption data with a specific focus on the town's top 10 facilities in energy consumption;
- Identified benchmarks for comparison purposes;
- Conducted a workshop with all stakeholder departments to gather feedback and inform the new CDM Plan. Workshop topics included all six areas of focus with discussions pertinent to each area of operations.

The plan was also presented to senior management for alignment with the town's vision for 2050 and strategic planning to realize the vision.

6.1 Energy conservation at the town

The 2020 CDM Plan reaffirms the town's commitment towards energy conservation as well as providing a roadmap for continued community leadership in energy and GHG emissions management. It builds on the successes of the previous plan with a particular focus on:

- Best practices for capital planning, operations and asset management.
- The importance of robust energy data and management processes
- Continuous improvement and ongoing education.

Developed around six areas of focus, the 2020 CDM Plan looks at tackling energy conservation through a variety of **organizational, technical and behavioural measures** to reduce energy use at town facilities, parks, outdoor pools and splash pads, streetlights and traffic lights. Each area of focus clearly identifies the department within the town that will be responsible for its implementation and support, as well as including key performance indicators to measure success.

The plan uses guiding principles and recommendations from three exciting and forward thinking initiatives currently underway at the town: the development of the town's Corporate Energy Policy, the development of the Community Energy Plan and recommendations from the Facilities Management Service Delivery Review.

Corporate Energy Policy

One of the key deliverables for the 2014 CDM Plan was to develop a Corporate Energy Policy to support and guide the town's sustainability efforts towards achieving council's long term goal of reducing GHG emissions by 80 per cent by 2050. Still in draft form, the policy will be complete by end of 2019 and presented to Council for approval in early 2020. The policy formalizes the town's commitment to energy conservation and reduction in greenhouse gas emissions resulting from municipal facilities, fleet vehicles (including transit), traffic signals and streetlights and other emissions generated by the town's operations. Although water and wastewater treatment are not included as they are the responsibility of Region of Halton, the policy will provide direction in terms of the efficient utilization of water within corporate operations. Staff will be developing various procedures in support of the policy.

In 2015, town Council adopted the following short and long-term GHG emissions targets for corporate operations.

- **Long-Term:** Reduce GHG emissions by 80 per cent below 2014 levels by 2050
- **Short-Term:** Reduce greenhouse gas per capita (intensity) emissions by 20 per cent below 2014 levels by 2030
- **And, 2030 sub-targets:**
 - 30 per cent per capita reduction in building emissions from 2014 levels by 2030
 - 10 per cent per capita in fleet emissions from 2014 levels by 2030
 - 40 per cent per capita reduction in streetlight emissions from 2014 levels by 2030

The CDM Plan incorporates **goals and areas of focus** which are aligned with the 2030 short term target and sub-targets. The 2020 Plan adopts 2014 as the new baseline, given the importance for the town to align its strategic policies with operational reviews.

Community Energy Plan

Together with the Oakville Energy Task Force and Sheridan College, the Town of Oakville is helping the community develop a Community Energy Plan (CEP) for Oakville. Oakville's CEP will help the town, residents and businesses work together to reduce energy costs and

greenhouse gas emissions while strengthening the local economy and building an affordable and reliable energy future.

The ultimate goal of the plan is to help us as a community:

- Use energy more efficiently and reduce waste
- Reduce energy costs
- Reduce greenhouse gas emissions
- Create more opportunities to attract businesses and jobs
- Increase the security of our energy supply
- Enhance our resiliency to climate change

Facilities Management Service Delivery Review

In 2018, the town conducted a comprehensive review of its facility maintenance and management model for all corporate facilities. The purpose of the review was to investigate opportunities for improvements to the delivery of facility management services, development of service level standards, enhanced data management and usage and continuous improvement actions that need to be undertaken to realize efficiencies. The facility service review was used to inform the CDM areas of focus and align with the changes in facility service delivery.

The following section describes the 2020 CDM Plan's Vision, Mission, goals and areas of focus along with associated actions.

6.2 2020 CDM Plan

Vision: To be the most livable town in Canada

Mission: The 2020 CDM Plan re-affirms the town’s position as a leader in corporate energy management and is a framework for energy conservation and management at the town. The plan provides a governance structure to facilitate planning, collaboration, implementation, progress verification and continuous improvement related to sustainability at the town.

The plan targets two goals with areas of focus that relate to both goals.

Goal 1: 20 per cent reduction in overall energy consumption by 2024 based on 2014 baseline

Goal 2: 30 per cent reduction in GHG emissions by 2024 based on 2014 baseline

- Area of focus 1 – Conservation**
- Area of focus 2 – Standard operating procedures**
- Area of focus 3 – Retro-commissioning**
- Area of focus 4 – Capital planning and projects**
- Area of focus 5 – Measurement and verification**
- Area of focus 6 - Communications and training**

Goal 1: 20 per cent reduction in overall energy consumption by 2024 based on 2014 baseline

In support of the corporate commitment towards a reduction on GHG emissions, the plan identifies an interim goal of **20 per cent reduction** in energy consumption by 2024. Table 4 provides an overview of the energy use reductions that the town will be targeting.

Table 4: Energy conservation goals for the 2020 CDM Plan

Goals	Energy (ekWh)		Reduction (per cent)
	2014	2024	
Corporate buildings (electricity)	29,937,280	27,271,469	9
Corporate buildings (natural gas)	40,012,661	31,217,891	22
Streetlights (electricity)	10,013,040	3,945,830	61*
Traffic lights (electricity)	606,791	552,271	9
Outdoor use (electricity)	909,407	963,848	-6
Outdoor use (natural gas)	677,383	516,739	23
Total	82,156,562	64,468,048	21

*Already achieved

Goal 2: 30 per cent reduction in GHG emissions by 2024 based on 2014 baseline

With a focus on electricity and natural gas consumption reduction, achieving a 20 per cent reduction based on 2014 levels will also help us achieve a **30 per cent reduction** in our GHG emissions by 2024. Table 5 provides an overview of the GHG emissions reductions that the town will be targeting for each of our operations.

Table 5: GHG emissions reductions goals for the 2020 CDM Plan

Goals	Emissions (tonnes CO ₂ e)		Reduction (per cent)
	2014	2024	
Corporate buildings (electricity)	1,198	545	54
Corporate buildings (natural gas)	7,107	5,545	22
Streetlights (electricity)	401	79	80
Traffic lights (electricity)	24	11	55
Outdoor use (electricity)	36	19	47
Outdoor use (natural gas)	120	92	23
Total	8,886	6,199	30

In order to realize goal 1 and goal 2, the town will undertake the six areas of focus described below. It is important to note that anticipated results attached to the following areas are dependent on having access to appropriate levels of funding for the implementation of the identified initiatives.

Area of Focus 1: Organizational - Conservation

Develop strategy for increased energy conservation efforts in existing buildings

The best way to reduce electricity use and GHG emissions is through reduced use. A service delivery review of the town’s facilities is currently underway looking at hours of operations and optimizing program use towards developing an effective conservation plan for town facilities. Achieved savings are calculated based on current energy use levels at all facilities and anticipates a 5 per cent reduction in energy use through the implementation of appropriate hours of operation and programming. Benefits extend beyond town’s operating budget and aligns with the Ministry’s conservation and demand management strategy.

Estimated cost:

Not applicable. Part of Energy Solutions Manager work plan

Key Performance Indicators:

Estimated energy savings: 3,175,000 ekWh

Estimated cost avoidance: \$250,000 annually

Estimated GHG savings: 335 tonnes CO₂e

Actions:

- 1.1 Analyze the results from the Facilities Management Service Delivery Review.
- 1.2 Identify standards and best practices for hours of operation and programming in diverse types of facilities (arenas, community centres, libraries, etc.).
- 1.3 Determine the most appropriate schedules for each type of operation based on both program efficacy and mechanical equipment and systems efficiency.
- 1.4 Implement new schedules and measure success based on occupancy rates and energy consumption reductions achieved.

Lead department:

Collaboration between Facilities and Construction Management and Sustainability and Government Relations

Area of Focus 2: Organizational / Technical - Standard operating procedures

Develop and implement Standard Operating Procedures for town facilities

Another key component to effective conservation is the consistent use of standard operating procedures (SOP). The need for robust SOP was a recurring theme in the town's Facilities Management Service Delivery Review and during the interviews conducted in the development of the 2020 CDM Plan. SOP will ensure town facilities are maintained to suitable standards and that corporate energy efficiency measures are implemented. Estimated savings were calculated based on a 10 per cent reduction on energy use in our top 10 facilities where the SOP will be implemented over the next five years.

Estimated cost:

\$100,000 to engage an external consultant to develop SOP

Key Performance Indicators:

Estimated energy savings: 5,117,000 ekWh

Estimated cost avoidance: \$410,000, annual

Estimated GHG savings: 533 tonnes CO₂e

Actions:

- 2.1 Establish best practices based on other organizations.
- 2.2 Develop SOP for the use of mechanical and electrical systems in the town's facilities, including equipment and plug-load.
- 2.3 Develop and implement procedures for Building Automation System use.
- 2.4 Determine appropriate set-points for mechanical and building systems based on use and type.
- 2.5 Perform commissioning of facilities to be operated using the SOP.

Lead department:

Collaboration between Facilities and Construction Management and Sustainability and Government Relations.

Area of Focus 3: Technical – Retro-commissioning

Develop and implement a robust retro-commissioning program

Retro-commissioning is a holistic process that seeks to improve how building equipment and systems are functioning. It ensures building systems are operating at design peak, are integrated and are performing in an efficient and effective manner. A regular retro-commissioning program will identify and solve operational issues or concerns with targeted maintenance and capital improvements that will enhance overall building energy performance while also reducing operating costs and occupant complaints. The retro-commissioning program is expected to tackle five facilities over the next five years and savings were calculated forecasting a 10 per cent savings on total energy use.

Estimated cost:

\$100,000 annually (commissioning consultant and small capital projects)

Key Performance Indicators:

Estimated energy savings: 1,837,000 ekWh

Estimated cost avoidance: \$130,000, annual

Estimated GHG savings: 212 tonnes CO₂e

Actions:

- 3.1 Establish best practices based on other organizations.
- 3.2 Develop a business case for a retro-commissioning program for town owned facilities.
- 3.3 Implement a retro-commissioning program for the town's facilities with the highest energy use and the most energy intensive equipment.

Lead department:

Facilities and Construction Management

Area of Focus 4: Technical – Capital planning and projects in existing buildings

Review standards for sustainable design and implement through small capital projects

Implement small capital projects based on end of life, retro-commissioning and previous facility energy audits. Where possible, capital projects will be selected from the state of good repair program and be part of the five year capital forecast. Estimated savings were determined from current capital project forecasts and previous energy audit results.

Estimated cost:

\$810,000

Key Performance Indicators:

Estimated energy savings: 2,384,000 ekWh

Estimated cost avoidance: \$200,000, annual

Estimated GHG savings: 209 tonnes CO₂e

Actions:

- 4.1 Review best practices based on other organizations.
- 4.2 Update the town's Sustainable Design Guidelines with an appropriate standard for capital projects at existing buildings.
- 4.3 Identify current and future standards for energy efficiency and GHG Emissions reductions on capital projects.
- 4.4 Implement energy retrofits based on end of life and ROI.

Lead department:

Collaboration between Facilities and Construction Management and Sustainability and Government Relations

Area of Focus 5: Technical – Measurement and verification

Establish a Measurement and Verification program for town-owned buildings

A measurement and verification (M&V) program will ensure that equipment and building systems at town owned buildings and infrastructure are performing optimally. An effective M&V program will complement the retro-commissioning program and allow for timely intervention while minimizing impact on facility operations. Savings are associated with the conservation measures taken by operations and through capital projects. M&V will establish appropriate baselines and confirm realized savings.

Estimated cost:

\$25,000 annually

Key Performance Indicators:

Top 10 facilities covered under the M&V program

Full scope of metering and sub-metering implemented in five of the top 10 facilities

Actions:

- 5.1 Establish an M&V program for existing town-owned buildings.
- 5.2 Develop a strategy for measurement and verification including methodology for ongoing energy modeling, data management, optimizing BAS and technology.
- 5.3 Develop an energy model for all of the town-owned buildings to help in capital decision making.
- 5.4 Pilot at larger town facilities and as part of retro-commissioning.
- 5.5 Establish the town's metering and sub-metering strategy.

Lead department:

Facilities and Construction Management

Area of Focus 6: Organizational / Behavioural - Communications and training

Implement a town-wide communications and training strategy

The 2020 CDM Plan is a significant milestone towards the town’s corporate commitment to greatly reduce GHG emissions. Although focused at the corporate level, engaging the larger Oakville community will be an essential and integral component towards the success of the plan. The facilities that the town operates are geared primarily towards resident and community use. Therefore it is important to communicate the objectives, outcomes and success of this plan to the broader Oakville community. An effective communications and training strategy will identify the gaps in awareness and actively engage town staff, building operators and the community towards building a culture of energy conservation.

Estimated cost:

\$100,000

Key Performance Indicators:

Estimated energy savings: 6,293,000 ekWh

Estimated cost avoidance: \$500,000 annual

Estimated GHG savings: 661 tonnes CO₂e

Energy Conservation Literacy Survey measuring public buy-in and understanding of energy conservation at the town

Actions:

- 6.1 Obtain senior management and council support to implement a town-wide communications and training strategy.
- 6.2 Establish a Town of Oakville Energy Team to act as champions for energy conservation and promote a green culture.
- 6.3 Based on previous training provided, identify additional training needs for facility managers and building operators.
- 6.4 Provide training to all of town staff in order to maximize the impact of energy conservation measures.
- 6.5 Develop awareness with town staff around energy conservation initiatives.
- 6.6 Introduce a public engagement campaign for energy conservation at the town’s facilities.

Lead department:

Collaboration between Sustainability and Government Relations and Facilities and Construction Management

7.0 Renewable Energy Generation

Solar photovoltaic (PV) installations

Oakville Hydro Energy Services Inc., a division of Oakville Hydro Corporation, in collaboration with the Town of Oakville has installed over 4,000 roof-top solar PV panels on four of the town’s corporate facilities.

Table 6: Solar Photovoltaic (PV) projects

Project name	Size (kW)	# of solar panels	Online date	Annual production capacity (kWh)	2017 production (kWh)	Production since online date
Sixteen Mile Sports Complex	458	2,104	Dec 2015	567,665	591,236	2,035,050
Glen Abbey Community Centre	190	858	Dec 2015	231,548	235,171	781,492
River Oaks Community Centre	185	853	Dec 2015	230,303	224,421	777,255
Town Hall	60	235	Jul 2012	63,403	83,969	545,087
TOTAL	893	4,050		1,092,919	1,170,383	3,896,087

In addition, the town is completing two additional solar PV installations on two new buildings:

- Fire Station 8: A 60kW system, with a total annual production capacity of 85,560 kWh is scheduled for completion in 2020.
- Southeast Community Centre: A 225 kW system, with a total annual production capacity of 267,288 kWh is scheduled for completion in 2020.

Geothermal heat pump (GHP) systems

The town operates one GHP system located at the Oakville Transit site. The system provides heating and cooling to 25,000 square feet of the facility’s administrative offices and is comprised of 46 outside wells on a vertical loop configuration that are connected to 12 roof-mounted heat pumps. The system has a heating and cooling capacity of 120 tons which is equivalent to 420 kW.

We are in the process of adding a second GHP system, located in the new Southeast Community Centre. This project is scheduled for completion in 2020 and includes 64 wells and water-to-water heat pumps in a vertical configuration. The system will have a heating and cooling capacity of 210 tons which is equivalent to 740 kW. This project has a high coefficient of performance (COP) at 4.0.

8.0 How to reach the 2050 goals and Vision 2057

Council's Strategic Plan vision, *to be the most livable town in Canada*, is being realized through thoughtful planning and development and by an array of community services offered to its residents. To achieve this vision, Council and staff created Vision 2057, integrating all master plans and key planning initiatives towards sustainable development. Within Vision 2057, one particular key strategic direction – *Preserve It! Vision 2057* – was created to provide guidance and confirm the town's commitment towards energy conservation and environmental stewardship.

Vision 2057 also establishes three principle documents that will guide all new programs, initiatives, plans and strategies:

- *Livable Oakville*. The town's official plan for land use and development in Oakville; it supports sustainable development and encourages energy conservation, district energy generation and green buildings by developers
- *Strategic Work Plan*. Sets out the strategic direction of the Town of Oakville, and serves as the framework to help guide Council's decision making. It identifies as a priority a transition towards a low carbon future.
- *Sustainability Plan*. Adaptive platform which helps define the way for the community of Oakville to achieve sustainability for present and future generations. It promotes energy use reduction as a strategy to significantly contribute to the conservation of the environment.

As stated previously, each successive CDM plan builds on the previous one and the achievements of the 2020 areas of focus will underpin the work needed to get to 2057. Over the next five years, town staff will be analyzing data, measuring and verifying results against KPI and reviewing best practices and internationally-recognized standards to determine the best path to 2057 as well as the technical, organizational and behavioural tools needed to get there.

Technical – Green construction

The goal of 80 per cent reduction in GHG emissions by 2050 will require changes to how we build new facilities, parks and roads / streets infrastructure as well as how we maintain and renew our existing portfolio. The town currently builds all new facilities over 500 m² to a LEED® Silver certification level. LEED® is a world recognized standard in green construction and requires performance under a variety of technical and soft parameters including indoor environmental quality, materials and resources, site selection and transportation, energy and water use and innovation. All of these components are important and will need to be maintained, however the town's future standard for design and construction will need to target resource efficiency with a focus on energy and water use.

In addition to changing how we design and construct new buildings, the town will need to retrofit existing buildings with consideration on how best to incorporate more efficient energy systems including combined heat and power, district energy, and renewables, while also continuing to introduce active and passive measures to reduce overall energy consumption.

To achieve the 2050 goal, third party standards will be reviewed and integrated into the town's Sustainable Design Standards:

- *Zero Carbon Building Standard (Canada Green Building Council)*. This standards moves the focus from energy to carbon emissions as the key performance metric. This shifts the focus to energy efficiency as well as the types of energy used in our buildings and infrastructure.
- *Green Globes (Green Building Initiative Canada)*. This building rating and certification tool, similar to LEED® looks at capital projects from a variety of categories, including site, energy, water, resource use, emissions and indoor environment.
- *Passive House Certification (Passive House Institute)*. This energy-based standard is used for new construction, and specifies optimum thermal comfort levels with minimum energy consumption.
- *District Energy Systems (DES)*. Also known as low-carbon thermal energy networks, these systems produce thermal energy in a central plant and distribute to multiple buildings and facilities in a specific area. The system usually provides heating and cooling generated at a centralized facility and transported through a series of pipes to where it is consumed. In order to take advantage of a DES, the buildings may have to be retrofitted in order to provide and receive the thermal load in the most appropriate way. The biggest challenge can be the installation of piping for the distribution system. DES solutions, especially those using hot water are more cost and energy-efficient, and thus can help greatly reduce GHG emissions as compared to stand-alone systems in buildings.

Technical - Renewable energy generation

The town has already invested in a variety of renewable energy generation, both in solar PV systems and geothermal energy. However, the ambitious goal of reducing 80 per cent of our GHG emissions by 2050 based on 2014 levels will require an integrated renewable energy strategy, which accounts not only for generation at specific buildings but also at how these renewable energy systems can be connected to other energy projects, such as District Energy Systems. Renewable energy systems will be extremely helpful in reducing the need to draw energy from current sources, while providing reliable and secure energy.

Technical – Asset life cycle model

Part of determining an effective green construction standard will be establishing a more robust methodology for asset cycle modelling. The Finance department has an asset management program that has been expanded under the 2014 CDM Plan that provides a starting point for future modelling that will consider the town's assets from a cradle to grave perspective including:

- Space management (programming)
- Project delivery management (project design and construction)
- Operations management (operations, preventive and corrective maintenance, repairs)
- Capital asset management (retrofits, upgrades, facility improvements, replacements)

Asset life cycle modelling gives building owners and operators the tools necessary to manage the total cost of ownership of their assets. It is tied closely to life cycle costing (LCC) which is discussed below.

Organizational – Green financial strategy

It is unlikely that the current funding sources and capital planning model will be enough to implement the types and sizes of projects the town will require to become more self-sufficient in the future. If we want to achieve our corporate commitment towards GHG reductions, we will require access to a variety of funding sources, grants, incentives and other mechanisms that will allow us moving forward with our initiatives, while helping reduce our energy costs.

Some alternatives that will be analyzed for their feasibility will include:

- Local, provincial and national grants and incentives
- Incentives from Local Distribution Companies (LDC)
- Public-private partnerships
- Energy service companies (ESCOs)

The resulting strategy should help provide a blueprint for financing energy conservation at the Town of Oakville beyond 2024.

Organizational - Life Cycle Costing (LCC)

Part of a green financial strategy will be how we allocate resources in capital planning. With significant financial pressures, we are primarily using up-front capital cost to make decisions. This will need to be expanded to include robust business cases for energy projects (similar to what was provided for the LED streetlight retrofit) and including LCC. Through a LCC perspective, decisions are made based on the total cost of ownership, from cradle (raw material extraction) to grave (end-of-life disposal). This means that costs that are usually not associated with capital projects, such as operations and maintenance, fuel use, repairs, recycling or reuse are assigned specific values and analyzed over the expected life of an asset. Other indirect costs are also included in decision-making, such as carbon costs linked to carbon taxes and/or

other carbon management frameworks, regulatory costs, quality of life and health, among others.

Behavioural – Vision 2057

The 2020 CDM Plan proposes the continuation of communication and engagement efforts to drive a sustained change in the Oakville community towards energy conservation. Looking at Vision 2057, a lasting change in people’s behaviours will be required to achieve the targeted levels of energy and GHG emissions reductions. This will drive new thinking and acting around energy use at facilities town-wide and community-wide.

9.0 Approval of 2020 CDM Plan by senior management

The 2020 CDM Plan was presented to the town's Executive Management Team and was approved at the June 2019 meeting. The plan did not raise any concerns with the town's ability of achieving the stated goals and objectives.

The 2020 CDM Plan will be presented to Council as one of the procedures under the new Corporate Energy Policy. This presentation will happen sometime in 2020; however, work on the implementation of the initiatives identified through the 2020 CDM Plan will happen before this presentation.

The Town of Oakville remains strongly committed towards energy conservation and will work towards the achievement of the goals specified in this plan.