

REPORT

Council

Meeting Date: April 25, 2022

FROM: Facilities and Construction Management Department

DATE: April 19, 2022

SUBJECT: **Progress Report on Reduction of Energy Use and Carbon Emissions for the Town of Oakville**

LOCATION: Town-wide

WARD: Town-wide

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RECOMMENDATION:

1. That the report entitled “Progress Report on Reduction of Energy Use and Carbon Emissions for the Town of Oakville” submitted by the Facilities and Construction Management department for the period 2014 – 2021 be received.
2. That the adoption of a Net Zero Carbon target for 2050 for all corporate activities in alignment with the federal Pan-Canadian Framework be approved.
3. That 2015 be adopted as the new baseline for energy and carbon reporting for corporate use.

KEY FACTS:

The following are key points for consideration with respect to this report:

- The *Canadian Net-Zero Emissions Accountability Act* came into effect on June 29, 2021, enshrining Canada’s commitment to achieve net-zero emissions by 2050.
- Building on Canada’s strengthened climate plan “*A Healthy Environment and a Healthy Economy*”, and *Pan-Canadian Framework, Canada’s 2030 Emissions Reduction Plan* outlines a roadmap for Canada to meet its enhanced Paris Agreement target to reduce emissions by 40-45% from 2005 levels by 2030.
- Adoption of a Net Zero target by 2050 for the Town of Oakville will mean more efforts will be required on the part of the town to bring corporate emissions down to zero within the next 30 years.

- As of 2021, the Town is close to meeting its 2030 interim targets (20% reduction in energy use and 30% reduction in carbon emissions). Although some of these results are derived from a reduction in facility use throughout the COVID-19 pandemic, the Town has also taken steps to reduce energy use and carbon emissions through energy conservation measures such as lighting retrofits and maximizing building automation system sequences and operations.
- The temporary impact of the COVID-19 pandemic has also allowed the Town to incorporate lessons learned to make adjustments within normal operations at our facilities.
- The Town is continuing to look at different approaches to achieve our 2050 targets. This includes feasibility studies, Net Zero deep energy retrofits, and the establishment of the Sustainable Design Standard, mandating any new construction or major renovation project to target a Net Zero carbon and low energy standard.

BACKGROUND:

In 2014, Town Council passed a motion to adopt formal corporate greenhouse gas (GHG) emission reduction targets for all operations, targeting an 80% reduction by 2050 based on 2014 levels. Since then, the Town also declared a climate emergency in 2019, strengthening its commitment to reduce the effect of corporate operations on climate.

From a regulatory perspective, the Town is required to report on its energy use on a yearly basis to the Ontario Ministry of Energy. In addition, the Town must prepare and update a Conservation and Demand Management (CDM) plan, a strategic document that outlines past performance and future projects that the Town will undertake to continue to reduce its corporate energy use and carbon emissions.

The federal government has also taken strides to combat climate change by adopting a Net Zero carbon target for the country as a whole by 2050. Other municipalities in Ontario, such as Whitby, Burlington and Halton Hills have adopted a Net Zero target already.

Corporate Energy and Carbon Reductions: Progress 2014-2021

Energy use and carbon emissions at the Town of Oakville, from a corporate perspective, include three main sources: facilities, internal fleet and our transit fleet. Main energy sources include electricity (facilities), natural gas (facilities), gasoline (internal fleet) and diesel (internal fleet, Transit fleet).

In Ontario, electricity production generates significantly less carbon emissions than other comparable fuels. This means that, from an environmental perspective, the town of Oakville needs to reduce its use of natural gas, diesel and gasoline and transition to an electrification strategy, which would help achieve the 2050 targets. From an economic perspective, electricity is the single largest utility cost for corporate operations at the Town. This creates conflicting requirements: as we look to reduce carbon emissions, the town would transition to an electrification strategy, which would in turn considerably increase operational costs. Therefore, in order to meet our targets while remaining fiscally responsible, the Town needs to rely more on electricity, while reducing the overall amount of energy used for corporate operations.

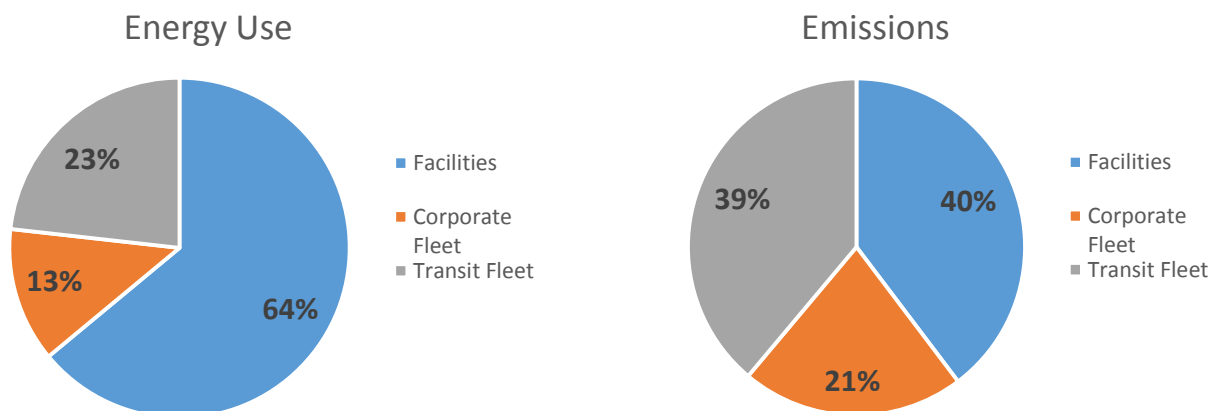
Table 1 shows a summary of energy use and associated carbon emissions for all corporate activities in 2014 (baseline year) and 2021 (last year for which full information is available). All energy use was converted to its equivalent kilowatt hours for comparison purposes. Carbon emissions were calculated for each source of energy using their respective emission factors and quantification methodologies as per the Partners for Climate Protection framework.

Table 1. Corporate energy use and carbon emissions, 2014 vs 2021

Category	Energy Source	Energy Use (ekWh)			Carbon Emissions (tonnes CO ₂ e)		
		2014	2021	% reduction	2014	2021	% reduction
Facilities	Natural Gas and electricity	86,075,920	60,834,392	29.3%	8,714	5,773	33.7%
Corporate fleet	Diesel, Marked Diesel and Gasoline	9,134,811	12,163,535	-33.2%	2,339	3,115	-33.2%
Transit fleet	Diesel	31,079,699	22,082,200	28.9%	7,953	5,655	28.9%
TOTAL		126,290,430	95,080,127	24.7%	19,006	14,543	23.5%

Figure 1 shows the breakdown of energy use and carbon emissions per corporate activity for the 2021 year. This graph in particular showcases the importance of reducing energy use in all corporate activities to have an equivalent impact on carbon emissions.

Figure 1. Breakdown of energy use and carbon emissions per corporate activity, 2021



Together, the information provided in Table 1 and Figure 1 provide two main findings:

- The achieved reduction of 23.5% in carbon emissions in 2021 takes us more than halfway through our 2030 interim target of 30% reductions; and
- The single largest contributor for energy use and carbon emissions at a corporate level are our facilities

Although work will be performed on all fronts, the Town needs to prioritize our built infrastructure to ensure that we meet our 2050 targets. Once fully implemented, the bus electrification program currently under development will help achieve an additional 35% reduction (or more) in carbon emissions from a portfolio-wide perspective. This means that, all things equal, the bus electrification program will take the Town to a 58.5% (or more) reduction in carbon emissions by 2050.

Considerations under a COVID-19 lens

Table 1 presents the performance on energy use for corporate activities at the Town of Oakville. Several projects have been implemented over the past few years, including the lighting retrofit of our streetlights and in several of our community centres, arenas and operations centres; update to Town Hall's building automation system (BAS); capital replacement program with more efficient units. Some items that need to be considered in order to understand the performance of the Town:

1. COVID-19 impacted energy use throughout our corporation in 2020, where facility closures and reduced transit schedules meant less energy was used overall, with a similar reduction in GHG emissions.
2. COVID-19 will also increase our energy use in facilities to be able to maintain recommended levels of air ventilation for our occupants

3. The Town has opened at least three new facilities since 2014 (Trafalgar Park Community Centre/Fire Hall 3, Oakville Trafalgar Community Centre and Fire Hall 8).

Even with an absolute increase in square footage at town facilities, overall energy use and carbon emissions continued to go down. This speaks to the Town's ability to implement projects, including new construction, which can help reduce energy use and carbon emissions as a whole for the corporate portfolio.

For each main source of energy use and emissions, the Town is also committing to continue the development and implementation of projects and initiatives that enhance the energy efficiency of our facilities.

- A) For our built infrastructure, the Town will continue to implement energy efficiency projects such as our lighting retrofits and capital equipment replacement. Through the renewable energy generation strategy and a low carbon roadmap, the Town will not only make our facilities more efficient, but additional low-carbon energy generation sources will be added to our facilities to help offset carbon emissions from the grid. With the development of a Sustainable Design Standard and a Deep Energy Retrofit Program, the Town will tackle both current and upcoming facilities, where Net Zero carbon and low energy will be key design principles to be included in all projects.
- B) In 2020, the Town of Oakville announced a seven-year plan to purchase 60 electric buses, with the view of converting the entire Transit Fleet to electric buses by 2035. The change from diesel to electricity would have a great impact on carbon emissions, while a robust renewable energy generation strategy would help reduce the impact on costs from an increase in electricity use.
- C) Several areas within the Town of Oakville are looking at developing a formal Green Fleet Strategy which would help reduce energy use and carbon emissions from our Corporate Fleet. Like the Transit fleet, using electric vehicles would greatly reduce carbon emissions; renewable energy generation would be required to offset the increase in electricity use to make the new cost of operation more sustainable in the future.

PREPARING THE CORPORATION FOR THE FUTURE:

As part of our efforts to meet our 2050 targets, the Town has developed two documents that will help guide our efforts towards more sustainable operations:

- Low Carbon Roadmap: this document identifies all corporate activities and their related energy use and carbon emissions, with proposed scenarios for carbon emissions reductions through electrification

- Renewable Energy Generation Strategy: this document outlines the framework for embedding select renewable energy generation technologies that can help offset the increase in electricity use at town facilities and other operations

As we continue our efforts moving forward, we have some decisions to make to ensure ongoing progress towards our 2050 targets. In order to prepare the Town of Oakville to be able to reach its commitment regarding carbon emission reductions, as well as ensure that we are in alignment with federal and provincial programs and regulations, it is recommended that:

- **The Town formally adopt a Net Zero carbon target.** The Federal government's climate plan adopted a Net Zero approach towards 2050. Several municipalities across Canada are moving towards a Net Zero emissions target for 2050, with an interim target of 40-45% reductions by 2030. By internally adopting a Net Zero target for 2050, the Town of Oakville would confirm its ongoing commitment towards cleaner corporate operations, and would align with the efforts being undertaken in other municipalities and organizations around the world.
- **The Town change the energy use and carbon emissions baseline from 2014 to 2015.** The province of Ontario started removing the use of coal for electricity generation in 2003, with 2014 being the last year when a coal-fired plant provided electricity to the province. Carbon emissions reductions reported for 2015 are largely due to the decarbonization of the electric grid in Ontario. Using 2015 as the baseline would represent a more appropriate challenge for the Town, as it would not account for those reductions achieved through the electrical grid.

The 2022 capital program includes funding to continue the work to better manage corporate energy and carbon use. This includes:

- Updating our Building Automation System (BAS) standards in Town facilities to ensure we have effective controls for temperature and operations;
- Initiating two feasibility studies for deep energy retrofits at our facilities. This will help us understand the level of resources and effort required to bring our buildings down to a Net Zero carbon and low energy standard;
- Development of the Town's first Sustainable Design Standard, building on the success of its Sustainable Design Guidelines; and
- Continue implementation of capital replacement programs, looking for the most energy efficient and least carbon intensive alternatives.

These studies/projects will help us understand the level of financial commitment required moving forward.

The road to 2050 (and our interim 2030 targets) will require a higher level of commitment at all levels in the organization. It is important for the Town to focus on:

- Securing appropriate resources to implement projects and initiatives derived from our low carbon roadmap, deep energy retrofit program and more;
- Securing partnerships with local, provincial and federal bodies and organizations that can help complement funding and resources requirements in order to meet our targets;
- Working closely with Finance and Asset Management to develop and implement a Life Cycle Costing framework that supports low carbon, high energy efficient projects.

In closing, the Town of Oakville has been working hard to meet its commitments towards 2050. We have accomplished much over the past 8 years and we need to build upon these successes to keep our momentum going. As a key stakeholder in the greater Oakville community under the Community Energy Strategy, the town needs to maintain its commitment to reduce our impact on the environment, maximize our investments in low carbon operations, and collaborate within and outside of Oakville to ensure we showcase our leadership as environmental stewards for the community.

CONSIDERATIONS:

(A) PUBLIC

The Town of Oakville is one of the major partners for the Community Energy Plan, and is seen as one of the leaders in implementing projects and initiatives that can help the greater community reach its goals. By updating our target, the Town would be strengthening its commitment to meet (and potentially exceed) federal and provincial requirements.

(B) FINANCIAL

The 2022 capital program includes funding to continue the work around corporate energy and carbon management. This includes:

- Updating our Building Automation System (BAS) standards in Town facilities to ensure we have effective controls for temperature and operations
- Initiating two feasibility studies for deep energy retrofits at our facilities. This will help us understand the level of resources and effort required to bring our buildings down to a Net Zero carbon and low energy standard
- Development of the Town's first Sustainable Design Standard, building on the success of its Sustainable Design Guidelines

- Continue implementing capital replacement programs, looking for the most energy efficient and least carbon intensive alternatives

These studies/projects will help us understand the level of financial commitment required moving forward.

(C) IMPACT ON OTHER DEPARTMENTS & USERS

Energy use and carbon emissions are shared among departments and users throughout the Town. Conversations are already underway for a variety of initiatives, and will continue with a number of departments and external partners.

(D) CORPORATE STRATEGIC GOALS

This report addresses the corporate strategic goal(s) to:

- Livability: implementing energy use and carbon emissions as a main decision-making tool can help not only enhance the air quality in Oakville, but ensure that our facilities continue to be safe to visit and use, while offering appealing designs and appropriate indoor environments.
- Environment: energy use and carbon emissions have a direct impact on the environment, and are considered a strategic priority for the corporation. By adopting a new baseline and new carbon emission reduction targets, the Town would be doubling down on its commitment to reduce the impact on the environment from its corporate activities, while showcasing leadership within the greater community energy plan for Oakville.

(E) CLIMATE CHANGE/ACTION

Energy use and carbon emissions reductions have a direct effect on our climate, as they are the main drivers for climate change mitigation. By doubling down our efforts, the Town would be addressing climate change mitigation through its corporate activities.

APPENDICES:

APPENDIX A – Breakdown of Energy Use and Carbon Emissions performance per type of operation

APPENDIX B – Oakville Greenhouse Gas Reduction Roadmap and Action Plan

APPENDIX C – Phase A – Baseline Analysis – Renewable Energy Generation Strategy

APPENDIX D – Phase B – Sustainability Report – Renewable Energy Generation Strategy

APPENDIX E - Phase C – Strategic Visioning Workshop – March 2021

APPENDIX F – Phase D – Strategy Summary – Renewable Energy Generation Strategy

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