

The Regional Municipality of York

Committee of the Whole
Environmental Services
May 2, 2019

Report of the Commissioner of Environmental Services

2019 Energy Conservation and Demand Management Plan Update

1. Recommendation

It is recommended that Council approve the 2019 update to the Energy Conservation and Demand Management Plan (Attachment 1) and its associated corporate greenhouse gas emissions targets.

2. Summary

Ontario Regulation 507/18 of the *Electricity Act, 1998* requires public agencies, including municipalities, to update their Energy Conservation and Demand Management Plan (Energy Plan) every five years. The Region's latest Energy Plan update must be made publicly available on or before July 1, 2019. Attachment 2 summarizes the key initiatives detailed in the Plan.

Key Points:

- The Energy Plan informs Council and staff about corporate greenhouse gas emissions from Regional energy consumption.
- The Energy Plan sets short, medium, and long term greenhouse gas emission reduction targets to 2051.
- The Energy Plan identifies conservation opportunities with potential to reduce annual corporate greenhouse gas emissions up to 60 per cent by 2051 compared to 2014 emissions; resulting in cumulative savings of approximately 930,000 tonnes of greenhouse gas emissions.
- Proposed energy conservation initiatives were developed in collaboration with all Regional departments, as well as York Regional Police and with Housing York Inc.

3. Background

The current version of the Energy Plan was approved by Council in [2016](#). Ontario Regulation 507/18 of the *Electricity Act, 1998* requires the Region to provide the public with an update to the Energy Plan by July 1, 2019 and make subsequent updates on a five year cycle.

The scope of the Energy Plan is limited to corporate service delivery that is under Regional control and does not include community emissions

The 2019 Energy Plan is limited to greenhouse gas emissions that are within the direct control and influence of York Region and includes transit buses, Region owned and operated buildings, police and ambulance vehicles, treatment and pumping of water and wastewater, traffic and street lighting as well as renewable energy generation. The Energy Plan does not include broader community emissions such as private dwellings, transportation, commercial and industrial emissions, which will be captured in the Region's Climate Change Action Plan that is currently being developed. Services purchased from other municipalities, such as water and wastewater treatment, are also excluded from the Energy Plan as these operations are confirmed to be captured in the host municipality's Energy Plan.

2019 Energy Plan is practical and considers effects of climate change, budget constraints, service level obligations, and future technology

Staff from 13 branches and all Regional departments, York Regional Police and Housing York Inc., participated in developing of the Energy Plan and its initiatives. The final result is a cohesive plan and a commitment to work toward the Vision 2051 aspirational goal of net-zero carbon emissions by 2051.

The Energy Plan forecasts the Region's path to reducing corporate greenhouse gas emissions based on our current viewpoint and understanding of future opportunities and technologies. Initiatives proposed in the Energy Plan are evaluated based on successful business cases and require attractive financial, environmental, and social benefits to the Region for its investment. It is anticipated that advances in technology and reductions in costs will serve to close the gap between what the Region can reasonably achieve today, and what can be achieved by 2051. The Energy Plan is practical and accounts for effects of extreme weather, budgets, service level obligations, and future evolution in technologies.

Energy Plan update includes a more accurate assessment of electricity generation sources

This version of the Energy Plan has adopted the annual National Inventory Report published by the Federal Ministry of Environment and Climate Change as the main source for calculating emissions from electricity consumption. Accordingly, the 2019 Energy Plan more accurately accounts for Ontario's clean electricity generation to reflect the closing of coal-fired generators and generation using nuclear and renewable sources.

The updated methodology provides more accurate reporting and results in a smaller environmental impact from the Region's operations that rely on electricity. By reflecting Ontario's low-carbon electricity grid in its emissions calculation, the Region's 2017 greenhouse gas emissions are 14 per cent lower than originally reported in the 2017 Corporate Energy Report presented to Council in [June 2018](#); down from 90,999 tonnes to 78,592 tonnes of carbon dioxide and equivalents. The reduction targets set by the Region have also been lowered by the same proportion, resulting in a neutral impact to the Region's ability to achieve its targets.

4. Analysis

The Energy Plan targets a 60 per cent reduction in annual corporate greenhouse gas emissions by 2051 compared to the Region's 2014 baseline

Vision 2051 challenges the Region to achieve net-zero carbon emissions by 2051. Table 1 lists proposed corporate emissions targets to 2051 based on current technology, behavioural changes, and prudent fiscal management.

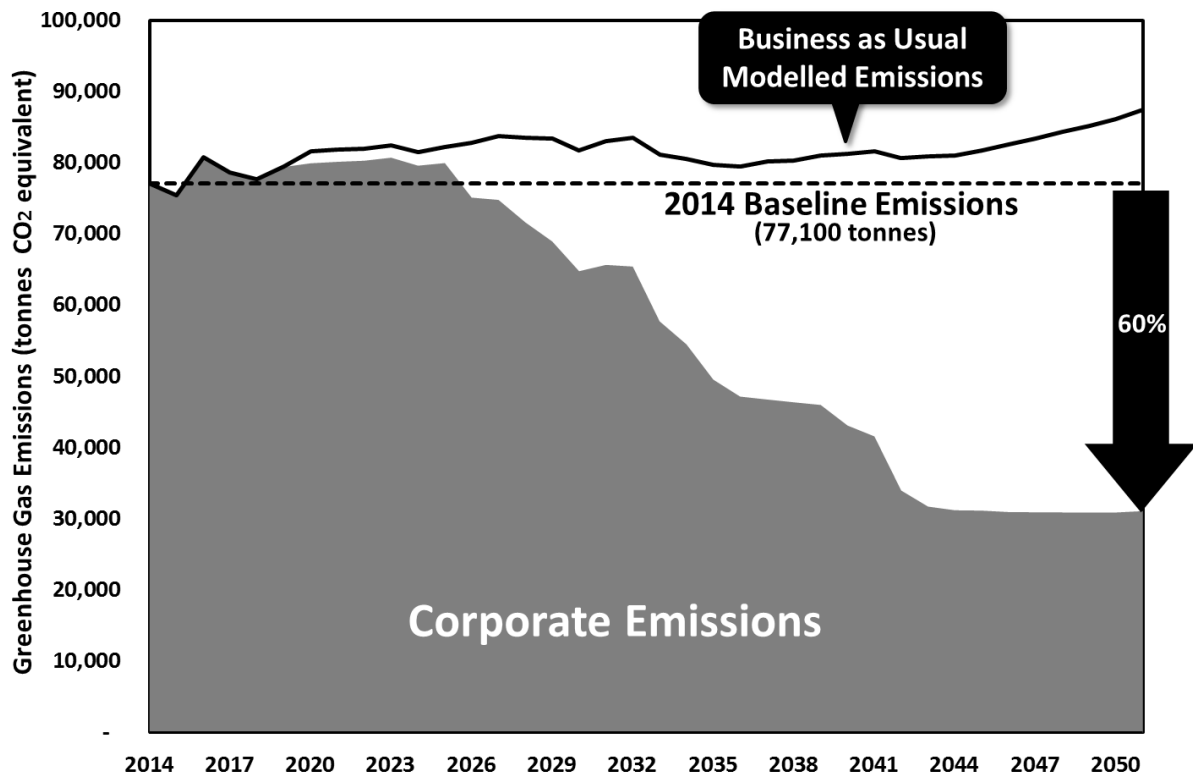
Table 1
Annual Corporate Emissions

	2020	2025	2030	2051
Forecasted Emissions (tonnes of carbon dioxide equivalent):	79,900	79,800	64,600	30,600
Change from 2014 Baseline:	+4%	+4%	-16%	-60%
Emissions Target (kg Per Capita)	64	58	43	14

Per capita emissions are forecasted to fall as population growth outpaces emissions growth

Corporate emissions will follow an upward emissions trend until 2023 with anticipated increases to the number of Regional buildings, fleet vehicles, transit service, water and wastewater infrastructure required to support expected Regional population growth. The trend is illustrated in Figure 1. In comparison, per capita emissions are anticipated to fall over the same period because population growth will outpace emissions growth. Decreasing per capita emissions are consistent with the Region’s 2019 to 2023 Strategic Plan that was approved by Council in [February 2019](#). Absolute emissions remain the primary focus of this Energy Plan because eliminating them is the key to reversing the cumulative impact of greenhouse gases on the global environment.

Figure 1
Forecasted Corporate Greenhouse Gas Emissions
and Impact of Proposed Initiatives



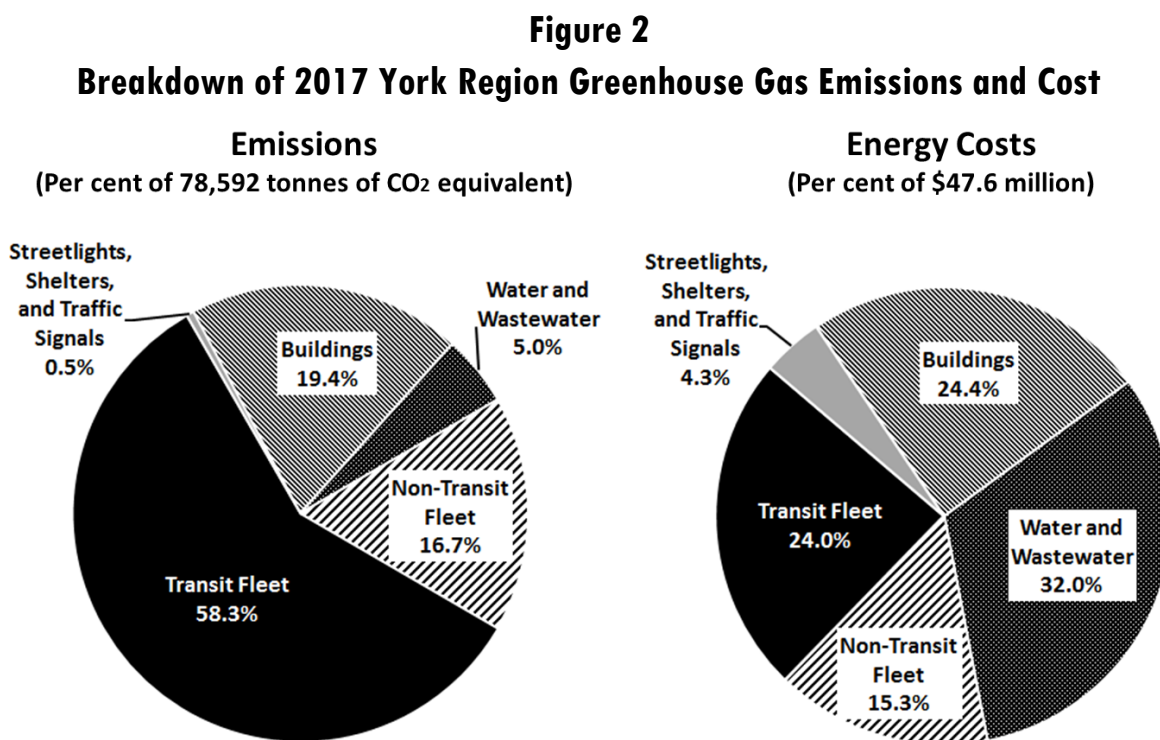
With the successful implementation of initiatives proposed in the Energy Plan, annual corporate emissions are projected to fall to 30,600 tonnes by 2051; 60 per cent below the 2014 baseline. The potential for changes to federal and provincial legislation, funding opportunities, technological advances, and service demands over future decades will unlock opportunities to strengthen York Region’s ability to reach its Vision 2051 goal of net-zero carbon emissions by 2051. These changes will be reflected in future five-year iterations of the Energy Plan.

The Energy Plan and its components are structured into areas of focus based on their emission source

The main sources of corporate greenhouse gases are emissions from fleet vehicles and transit buses, conditioning occupied building space, and water and wastewater treatment and pumping. Strategies to reduce these corporate emissions are structured to align with four primary focal areas namely, buildings, non-transit fleet, transit buses, and water and wastewater processes. Secondary areas of focus include street light conversions, renewable energy projects, and the Region's material recovery facility reflecting their relative small potential for emission reductions.

Energy projects will need to strike a balance between cost and emissions savings

Figure 2 below compares the relative contribution of corporate greenhouse gas emissions and cost by area of focus.



Currently, low cost fossil fuels (diesel, gasoline and natural gas) result in high levels of emissions compared to more expensive Ontario generated electricity, the majority of which is generated from very low emission sources such as nuclear and water. In 2017, transit buses and fleet vehicles accounted for 75 per cent of the Region's total corporate emissions, and 39 per cent of its total cost. Water and wastewater processing and streetlights, which predominantly use electricity, accounted for only five per cent of total corporate emissions, but 36 per cent of total energy costs.

While attractive cost-benefit indicators from electricity saving projects are more appealing to invest in, initiatives that conserve fossil fuels are equally important as the objective of the

Energy Plan is to achieve net-zero carbon emissions in a financially responsible manner. Staff will continue to balance cost and emissions savings in prioritizing future projects, by applying a fiscally responsible approach.

The Energy Plan provides flexibility to account for the fast pace of evolving technologies

Technology continues to evolve at a fast pace in all economic spheres to reduce greenhouse gas emissions. One of the most relevant examples is the advancement of battery electric transit bus technology. In the 2016 Energy Plan, battery electric transit buses were proposed for an indeterminate period beyond 2030 because the technology was still in its infancy. By 2019, the technology had advanced such that in [January 2019](#), Council approved the purchase of six battery electric buses for a pilot project along two Newmarket bus routes. Transit currently anticipates receiving these battery electric buses in December 2019 and a public rollout is scheduled to begin in Q1 2020. Zero emissions transit buses have the potential of cutting York Region corporate emissions in half.

Investment in renewable energy generation is not proposed in the 2019 Energy Plan

Renewable energy projects, specifically solar photovoltaic generation, were a significant part of the 2016 Energy Plan based on the Feed-In Tariff (FIT) program that provided guaranteed revenues from the Province. Prior to the FIT program's cancellation in 2018, the Region installed 375 kW of generation capacity across 21 sites. Annual revenues are projected to total approximately \$150,000 per year for a term of 20 years.

Renewable energy generation is not a proposed initiative in the 2019 Plan until there is more financial certainty. Staff are analyzing the potential for solar electricity generation at Regional facilities to offset the cost of electricity supplied by the local utility.

5. Financial

Capital investments by each department will be required to achieve targets

Initiatives proposed in the Energy Plan will require investments from each department that may be incremental to current ten-year capital budgets. Proposed investments will be evaluated based on associated business cases requiring positive cost benefit results with a targeted capital recovery of ten years. The Energy Plan is designed to minimize the financial impact on existing capital budgets by leveraging existing plans, planned asset replacement cycles, external funding, and internal reserves to support Regional sustainability initiatives. Furthermore, decreasing costs of advanced technologies and renewable alternatives are making investments in energy efficient asset replacement more affordable.

In the short-term, the Region is adapting to recent reductions in provincial incentives and funding to support energy conservation initiatives. Departments continue to develop business

cases based on positive lifecycle cost benefit analysis as justification for conservation investments and are moving forward with initiatives deemed reasonable and fiscally responsible. Staff remain optimistic that in the longer-term, additional provincial and federal funding may become available once climate change mitigation and adaptation become greater priorities.

A Triple Bottom Line approach will balance the financial, environmental, and social attributes of each project

Before a conservation project is budgeted, projects will be required to achieve a positive financial result using valuation methods such as Net Present Value (NPV) or Internal Rate of Return (IRR). Cost savings from energy conservation initiatives will target a project capital cost recovery of ten years. Once the positive financial result has been achieved, a triple bottom line analysis, which accounts for factors such as greenhouse gas emissions reduction (environmental), community impact (social), and cost/savings (financial) will be used to allocate finite capital to competing project proposals. Financial and environmental attributes account for over 80 per cent of the total score. Staff developed the methodology to ensure that a balance is achieved between project costs, emissions savings and societal merits.

Investments proposed in the short-term are based on existing and proven technologies

Tables 2 and 3 summarize the projected investments, savings, and emission reductions by area of focus and projected lifecycle of the initiatives. The accuracy of forecasts associated to planned initiatives for the six-year term summarized in Table 2 is high based on existing and proven technologies. In some cases, pilot programs associated with planned initiatives are already in progress. Emission reduction forecasts associated with long-term measures (Table 3) are less certain due to the corresponding time horizon.

Table 2
Projected Short-Term Asset Investments (2019 to 2025)

Category	Incremental Capital Cost (\$ million)	Estimated Operating Savings (\$ million)	Estimated Emissions Avoidance (tonnes)
Water and Wastewater Processes	\$3.6 M	\$5.0 M	900
Streetlights, Beacons, and Transit Shelters	\$1.5 M	\$2.4 M	400
Total	\$5.1 M	\$7.4 M	1,300

Table Note: All values are cumulative over the six year period and in nominal non-discounted dollars

Table 3
Projected Long-Term Asset Investments (2019 to 2030)

Category	Incremental Capital Cost (\$ million)	Estimated Operating Savings (\$ million)	Estimated Emissions Avoidance (tonnes)
Electric Transit Bus and Infrastructure Pilot	\$7.7 M*	\$2.2 M	7,200
Buildings	\$6.3 M†	\$16.2 M	20,400
Non-Transit Fleets	\$0.5 M	\$0.5 M	1,700
Total	\$14.5 M	\$18.9 M	29,300

*\$7.7 million approved by Council (Jan 2019) includes both infrastructure investments and electric buses. Incremental cost attributed to electric buses over conventional diesel buses is approximately \$3 million of the \$7.7 million total.

† Approximately \$6 million available through the Green Energy and Innovation Reserve Funds.

Table Note: All values are cumulative over the eleven year period and in nominal non-discounted dollars

Main stream adoption and mass production of technologies such as electric buses will serve to minimize the incremental cost associated to energy efficient low emission alternatives in the coming decade.

Funding for conservation projects will come from asset management reserves, development charges and external funding sources

In the case of existing asset improvements, initiatives will be funded through asset management reserves. Where applicable for initiatives associated with new services, funding will be covered through development charges. An example would be the incremental cost of energy efficient equipment for a new pump station which will be funded through development charges. Staff aim to achieve economies of scale through alignment of conservation projects with asset preservation projects and maximize all available external funding and incentives to improve business cases. The potential for changes to federal and provincial legislation, funding opportunities, technological advances, and service demands over future decades will unlock opportunities to strengthen York Region’s ability to reach its Vision 2051 goal of net-zero carbon emissions by 2051. These changes will be reflected in future five-year iterations of the Energy Plan.

Business as usual is estimated to cost the Region \$73 million in carbon taxes from 2019 to 2051 if no emission reduction actions were implemented

On April 1, 2019, the Federal Carbon Pricing Program was implemented at \$20 per tonne of carbon dioxide equivalent (greenhouse gases) and will increase each year by \$10 until it reaches \$50 per tonne in 2022. The tax will be paid by the Region as part of its retail fuel purchases. Table 4 highlights the financial impact over time on Regional operating budgets.

Table 4
Projected Annual Cost of Regional Carbon Emissions

Fuel Type	2019	2020	2021	2022
Natural Gas	\$0.29 M	\$0.44 M	\$0.58 M	\$0.72 M
Gasoline	\$0.24 M	\$0.35 M	\$0.47 M	\$0.59 M
Diesel	\$0.90 M	\$1.40 M	\$1.80 M	\$2.30 M
Total	\$1.43 M	\$2.19 M	\$2.85 M	\$3.61 M

NOTE: Based on 2017 Regional consumption volume for each fuel type

Energy efficiency measures proposed by initiatives in the Energy Plan are estimated to save the Region a cumulative \$73 million in carbon taxes from 2019 through to 2051. These savings are based on the successful implementation of all initiatives in the Energy Plan that result in the avoidance of 927,000 tonnes of greenhouse gas emissions through energy efficiencies. Over the same period, the carbon tax is expected to increase to \$100 per tonne in 2051 based on the anticipated rate of inflation. Geopolitical events that impact the price of fossil fuel are not quantified in the savings calculation but reducing reliance on fossil fuels will further shield the Region from events beyond its control.

6. Local Impact

The Energy Plan proposes financial, environmental, and social benefits for all York Region municipalities, including their businesses and residents. Investments proposed in this Energy Plan are required to return their corresponding capital costs through energy cost savings over time. Fiscal prudence optimizes the overall cost of service delivery which, in turn, shields constituents from rising costs associated with older, less efficient technology and operations. Reduced fuel consumption will shield the Region against the rising cost of fuel, carbon taxes and translate into reduced greenhouse gas emissions that normally occur within the boundaries of each local municipality. In addition, continued greenhouse gas reduction Region-wide benefits the environment of all local municipalities.

7. Conclusion

The 2019 Energy Conservation and Demand Management Plan update identifies opportunities to make prudent investments in the future of Region and its residents. It charts a course toward net-zero carbon emissions by 2051, and positions York Region as an environmental leader. Through a commitment to conservation and increased efficiency, along with five year updates to the Plan, the Region is well positioned to identify and implement new/emergent technologies and approaches needed meet its aspirational Vision 2051 goal.

For more information on this report, please contact David Szeptycki, Director Strategy & Innovation at 1-877-464-9675 ext. 75723. Accessible formats or communication supports are available upon request.

Recommended by:

Erin Mahoney, M. Eng.
Commissioner of Environmental Services

Approved for Submission:

Bruce Macgregor
Chief Administrative Officer

April 17, 2019
Attachments (2)
8975986

DS/ek/tb