

Clause 8 in Report No. 10 of Committee of the Whole was adopted, without amendment, by the Council of The Regional Municipality of York at its meeting held on June 29, 2017.

8

2016 Corporate Energy Report

Committee of the Whole recommends adoption of the following recommendation contained in the report dated May 25, 2017 from the Commissioner of Environmental Services:

1. That this report be received for information.
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Report dated May 25, 2017 from the Commissioner of Environmental Services now follows:

1. Recommendation

It is recommended that this report be received for information.

2. Purpose

This report provides Council with an update on greenhouse gas emissions from Regional operations, along with associated energy consumption and costs. This annual report also discusses initiatives undertaken by the Region to achieve goals set out in the Energy Conservation and Demand Management Plan.

3. Background and Previous Council Direction

Region is making good progress toward achieving Council-endorsed emissions reduction targets

The Energy Conservation and Demand Management Plan (the Plan), endorsed by Council [May 19, 2016](#), is a legislative requirement as part of the *Green Energy Act, 2009* and Ontario Regulation 397/11. The Plan sets targets for greenhouse gas emissions inspired by Vision 2051 and its aspirational goal of moving the Region toward zero emissions from Regional operations.

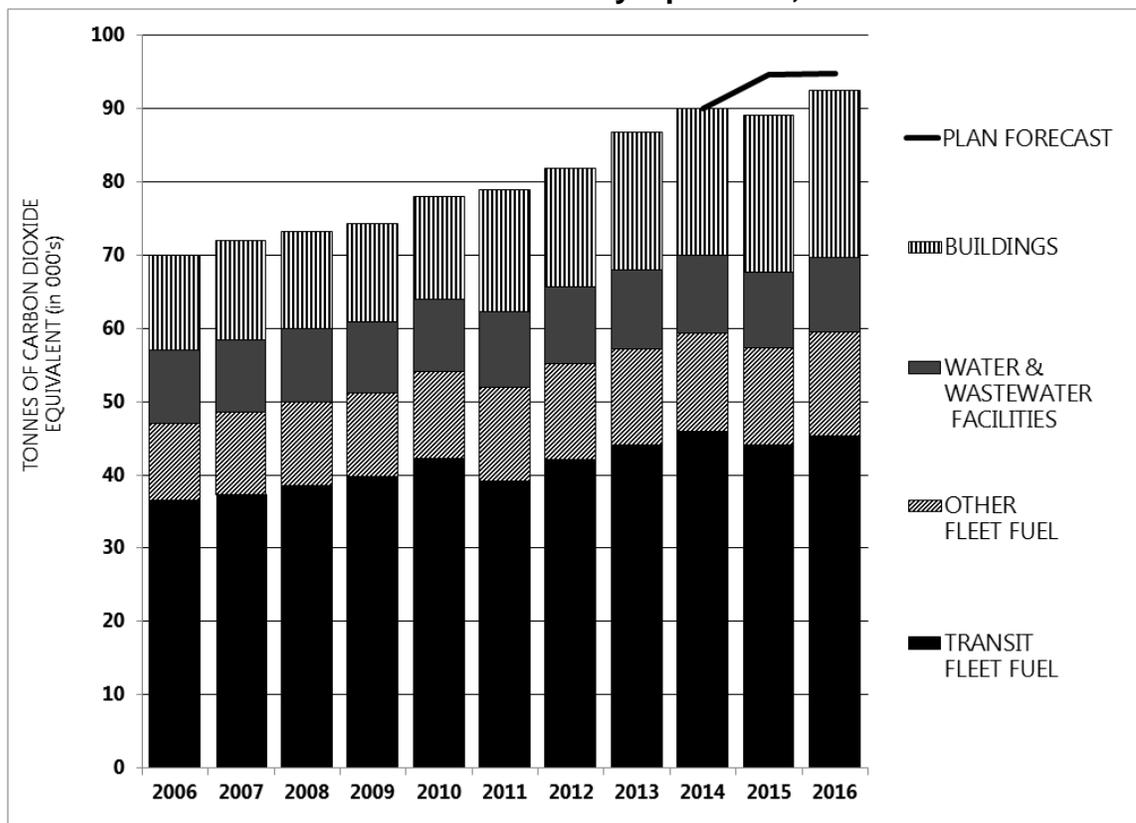
While the Corporate Energy Report is not legislatively required, it has been prepared annually for Council since 2006. With the advent of the Plan, the Corporate Energy Report has become the primary tool that tracks annual progress toward the Region’s greenhouse gas emissions targets.

4. Analysis and Implications

Greenhouse gas emissions from Regional operations totalled 92,384 tonnes in 2016; 2.5 per cent below the Plan forecast emissions for 2016

The Plan set incremental annual targets for total and per capita emissions to ensure that the Region’s near-term efforts will achieve its long-term Vision 2051 emissions goal. Plan forecast emissions in 2016 were 94,788 tonnes in anticipation of annual Regional growth. Actual emissions of 92,384 tonnes were 2.5 per cent lower than forecast, which reflects Regional conservation efforts undertaken in recent years. Figure 1 shows the trend and forecast and breaks down total emissions by operation from 2006 to 2016.

**Figure 1
Greenhouse Gas Emissions by Operation, 2006 – 2016**



Seventy per cent of the Region's 2016 increase in greenhouse gas emissions are from two new large facilities

The recent addition of two new large facilities to the Region's portfolio of assets are the main drivers behind increased greenhouse gas emissions in 2016. The Transit Operations, Maintenance, and Storage Facility at 55 Orlando Avenue in Richmond Hill is a 44,700 square meter transit facility used for maintenance and storage of buses. The greatest driver of energy consumption for the facility is for health and safety (e.g. ventilation) and building heating. In 2016, operation of this facility produced approximately 1,640 tonnes of greenhouse gas emissions.

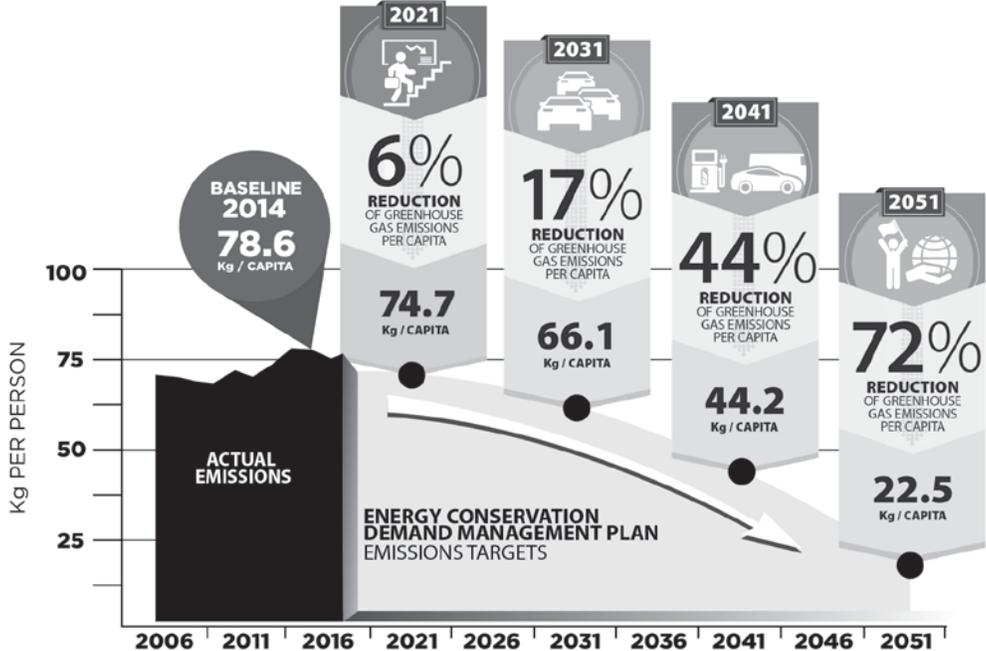
The Richmond Hill Housing and Community Hub at 10415 Yonge Street is a new 18,800 square meter Regional facility commissioned in mid-2016, which produced 610 tonnes of greenhouse gas emissions. The Community Hub is a multi-purpose facility that provides 202 units of social housing, a drop-in centre, recreational space, and emergency bedrooms for at-risk youth.

Combined, these new facilities account for seventy per cent (2,250 tonnes) of the increase in greenhouse gas emissions in 2016. Once both facilities have stabilized operations, it is anticipated that greenhouse gas emissions will decrease as operational efficiencies are realized.

Per capita greenhouse gas emission targets are commonly used by municipalities experiencing significant growth

As demonstrated with the addition of new facilities to the Region's asset base, municipalities that experience significant growth are challenged to reduce total greenhouse gas emissions when services are required to meet the needs of a growing community. As a result, it is common for growing municipalities to set per capita targets to measure greenhouse gas emissions. Markham, Vaughan, Richmond Hill and Whitchurch-Stouffville also employ per capita targets to monitor greenhouse gas emissions in comparison to population. Figure 2 shows the Region's actual per capita trend from 2006 to 2016 and highlights intensity targets set for 2021, 2031, 2041, and 2051.

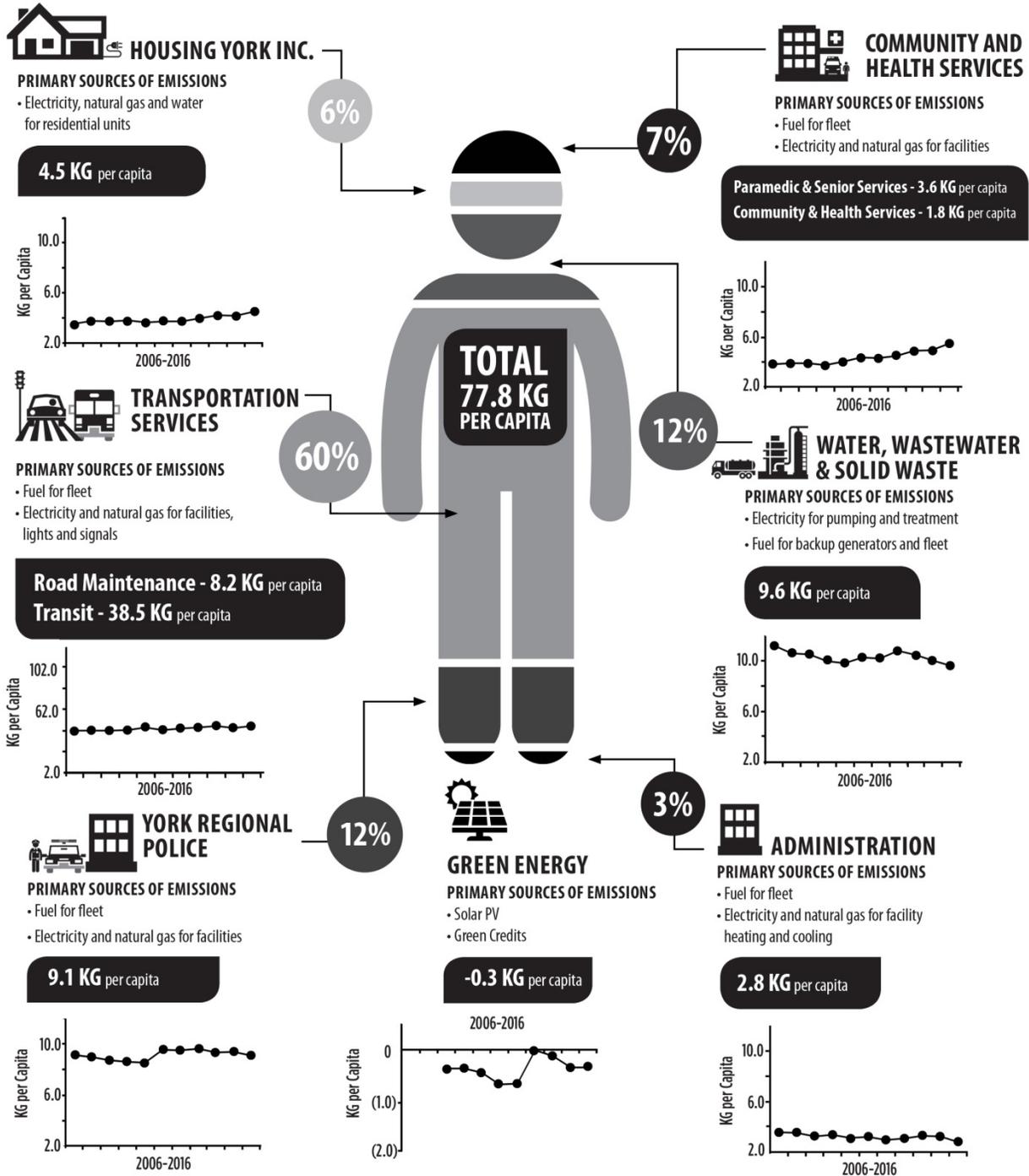
Figure 2
Per Capita Greenhouse Gas Emissions and Targets
from Regional Operations, 2006 - 2051



Regional greenhouse gas emissions in 2016 were 77.8 kilograms per resident

To simplify annual reporting, Council approved per capita targets and absolute targets. Based on forecasted growth in York Region, per capita measurement is an effective way to evaluate the Region's actions to reduce corporate greenhouse gas emissions. The Plan per capita target for 2016 was 77.5 kilograms per resident. Actual emissions of 77.8 kilograms per resident were slightly above forecast, however the Region is still trending toward achieving the Plan's official target of 74.7 kilograms by 2021. Figure 3 illustrates per capita greenhouse gas emissions from Regional services and programs.

Figure 3
2016 Per Capita Greenhouse Gas Emissions from Regional Services



HOW MUCH GREENHOUSE GAS IS PRODUCED TO PROVIDE REGIONAL SERVICES FOR ONE YEAR PER RESIDENT?
 TOTAL EMISSIONS: 92,384 TONNES | 2016 POPULATION: 1,186,907

All Regional departments are contributing to reduce greenhouse gas emissions

Contributions toward the reduction of greenhouse gas emissions have been made by all Regional departments. Notable successes in 2016 to reduce greenhouse gas emissions growth are summarized in Table 1.

**Table 1
2016 Greenhouse Gas Reductions Accomplishments**

Accomplishments	Service Area
<p>Lighting and Mechanical Upgrades Replaced police headquarters parking structure lighting with LEDs, adjusted HVAC and lighting schedules to reflect occupancy. Combined, these initiatives cost \$33,500, have a 2.2 year payback, and helped reduce building electricity consumption by 22 per cent.</p>	York Regional Police
<p>Sustainable Building Certifications Bill Fisch Forest Stewardship and Education Centre earned the LEED® Platinum certification. Richmond Hill Operations, Maintenance and Storage Facility earned the LEED® Silver certification. Ten facilities working toward minimum LEED® Silver certification through design and construction.</p>	Corporate Services and Environmental Services
<p>Ambulance Anti-Idling Technologies New ambulances equipped with anti-idle technology conserved 4,817 litres of fuel (equal to 12.2 tonnes of greenhouse gas emissions) in only two months of use.</p>	Paramedic and Senior Services
<p>Building Energy Audits Transit awarded a contract for facility management services at four YRT/VIVA Operations, Maintenance and Storage Facilities that include a minimum of 2 per cent annual energy reductions.</p>	Transportation Services
<p>Data Visualization Published energy use and greenhouse gas emissions data to facilitate public access to the Region's data.</p>	Corporate Services

Accomplishments	Service Area
<p>Tenant Engagement Workshops and Facility Retrofits</p> <p>Community Champion Program was expanded to four buildings after success of the 2015 pilot. Tenants at HYI buildings are educated and challenged to find energy savings through behavioural choices.</p> <p>HYI, in partnership with non-profit housing providers, received \$758,123 in Provincial Funding in support of energy retrofit activities in community housing, which included installing cold climate heat pumps and new programmable thermostats.</p>	<p>Housing York Inc.</p>
<p>Inflow and Infiltration Reduction</p> <p>Strategies to reduce inflow and infiltration into the Regional wastewater system achieved an additional reduction of 1.99 MLD in 2016. Total reductions to date are 11.6 MLD, which represents 29 per cent of the 2031 reduction target.</p> <p>Solar Photovoltaic Generation</p> <p>A total of 243,000 kWh and \$136,000 was generated by Regional solar photovoltaic installations in 2016 under the Independent Electricity Systems Operator Feed-in Tariff Program.</p> <p>Water Conservation</p> <p>Water consumption in 2016 fell to 199 litres per capita per day. The Region remains on track to achieve its 2051 aspirational goal of 150 litres per capita per day.</p>	<p>Environmental Services</p>

York Region forests are not measured by the Corporate Energy Report but represent a significant community emissions offset

On [November 17, 2016](#) Council approved the York Region Forest Management Plan that set a path towards net gains in canopy cover from the current 31 per cent to 40 per cent by 2051. Last year it was reported in the Corporate Energy Report that York Region trees and forest had the capacity to store 35,000 tonnes of carbon dioxide each year. With the additional inventory reported by five local municipalities, this total is now assessed to be

approximately 80,000 tonnes of carbon dioxide that is being stored each year by Regional trees and forests.

Bill Fisch Forestry Stewardship and Education Centre earned LEED® Platinum certification and two additional awards in 2016

The Bill Fisch Forestry Stewardship and Education Centre earned its Leadership in Energy and Environmental Design (LEED®) Platinum certification, the highest designation by the Canada Green Building Council. In the past year, the building has also been awarded first place for project of the year from both the Project Engineers of Ontario – York Chapter and the Ontario Public Works Association.

Regional initiatives planned for 2017/18 will have an impact on future greenhouse gas emissions

Looking forward, the Region plans to implement a number of initiatives in 2017/18 that will have an impact on future greenhouse gas emissions.

Transit will pilot six zero-emission electric buses by early 2018

York Region is one of two municipalities participating in the Pan-Ontario Electric Bus Demonstration and Integration Trial beginning early 2018. With financial support from the Provincial Government and in partnership with private sector companies and local utilities, the Region will pilot zero-emissions transit on three of its current Newmarket routes using six electric buses. This initiative has significant implications for the Region as 49 per cent of corporate emissions are from transit bus fuel consumption.

Technical standards for future construction and renovation of buildings will emphasize energy efficiency

The current Regional policy for new buildings is construction to LEED® certification at the Silver level. Staff are revising these current technical standards for new construction and renovations of Regional buildings to emphasize energy efficiency and life-cycle performance. Buildings have a lifespan in excess of forty years, so it is important to have standards that reduce energy consumption and greenhouse gas emissions as part of design or redesign. Staff continue to review and evaluate the Region's current standards for new construction and had planned to develop an updated corporate policy for Council approval in Q4 2017. Staff require additional time for further internal stakeholder engagement on this matter and plan to submit the updated policy for Council approval in Q1 2018.

Advisory position with the Independent Electricity System Operator will assist York Region with conservation program advocacy

The Region's Manager of Climate Change and Energy Conservation has joined the Independent Electricity System Operator's (IESO) Stakeholder Advisory Committee to provide a municipal perspective on Ontario electricity program matters. The Committee provides feedback directly to the IESO Board and Executive with respect to the future evolution of the market, planning of the power system, and the design and implementation of electricity conservation programs.

Corporate Energy Report details annual progress on reducing greenhouse gas emissions against targets set in the Energy Conservation and Demand Management Plan

Reducing greenhouse gas emissions and increasing energy conservation are specifically highlighted in a number of Council objectives, policies and actions. Initiatives proposed in the Energy Conservation and Demand Management Plan align with the 2015 to 2019 Strategic Plan that prioritize areas of Sustainable Environment, Healthy Communities, and Good Government; the Regional Official Plan's promotion of Healthy Communities; and Vision 2051, which strives to achieve a Resilient Natural Environment and Agricultural System, along with Living Sustainably.

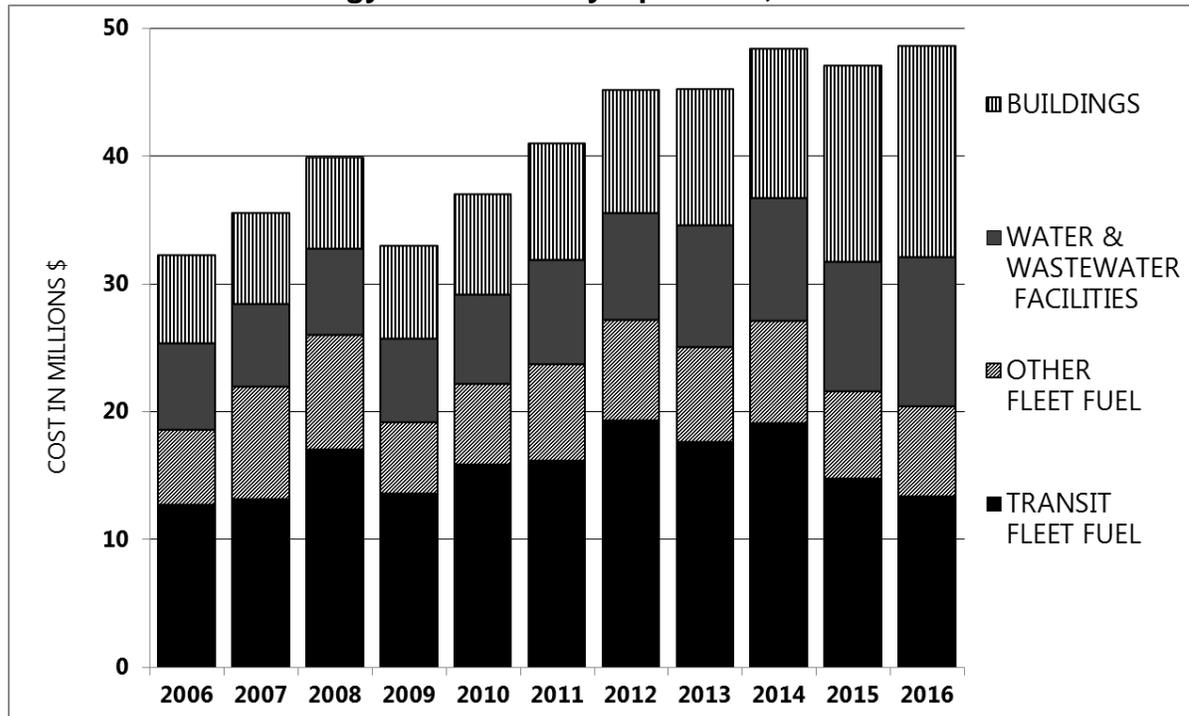
Achieving a long-term goal requires near-term targets and commensurate financial investments. Annual measurement and reporting of performance provides transparency to stakeholders that investments are achieving desired financial returns, achieving conservation, and reducing greenhouse gas emissions.

5. Financial Considerations

Energy costs of Regional operations totalled \$48.5 million in 2016

Total 2016 energy costs for Regional operations increased by \$1.4 million compared to 2015 and totaled \$48.5 million. The increase was primarily attributed to an increase in electricity consumption (4.3 per cent) and an increase in the price of electricity (8 per cent). Figure 4 shows the trend and cost break down by operation.

**Figure 4
Energy Cost Trend by Operation, 2006 – 2016**



Changes in electricity prices increased the cost of operating Regional buildings, water and wastewater processes, and street and traffic lights.

The price of gasoline, diesel fuel, and natural gas fell in 2016 due to the decline in oil prices. Comparatively, the volume of these fuels consumed by the Region increased in 2016 as compared to 2015.

Cap and Trade impacts the Region's cost of energy and underscores the importance of energy conservation

Details provided by the Province with regard to the Cap and Trade program indicate that facilities emitting greater than 10,000 tonnes of equivalent carbon dioxide per year will be impacted by this legislation. Reporting obligations for both the Duffin Creek Plant and the Durham York Energy Centre are the responsibility of the Region of Durham. The Duffin Creek Plant emissions are below the 10,000 tonne threshold and the Province has committed to providing free allowances to offset emissions from the Durham York Energy Centre during the first compliance period (2017 – 2020).

Modelling completed during the Environmental Assessment for the Durham York Energy Centre and approved by the Ministry of the Environment and Climate Change indicates that the facility emits approximately 44 per cent less greenhouse gas than traditional landfill disposal methods. Table 2 summarizes the Region's next three largest Regional emitting facilities, which are well below the minimum voluntary participation threshold.

Table 2
Top Three Regional Greenhouse Gas Emitters, 2016

Regional Facility	Emissions (eCO₂)*	KPI (eCO₂/m²)	LEED® Certification
Transit Operations, Maintenance, and Storage Facility – 55 Orlando Ave., Richmond Hill	2,940 tonnes	65 kg	Silver
Transit West Operations, Maintenance, and Storage Facility – 8300 Keele St., Vaughan	1,830 tonnes	88 kg	Silver
York Regional Police Regional Headquarters – 47 Don Hillock Dr., Aurora	1,680 tonnes	74 kg	Silver

*Emissions are derived from electricity and natural gas consumption.

Indirectly, the Region will be impacted by Cap and Trade through its purchase of goods and services; most prominently fossil fuels. Regional estimates predict annual transportation fuel and natural gas purchases to increase by \$1.4 million in 2017. Because the price for these commodities are also influenced by supply and demand market forces, the impact from Cap and Trade legislation may be offset or exacerbated by changes in market prices.

Energy conservation and demand management initiatives are an effective way for Region to reduce financial exposure to Cap and Trade program

The financial impact to the Region of the Cap and Trade program can be mitigated through energy saving opportunities identified in the Energy Conservation and Demand Management Plan. An increase in the cost of fossil fuel based energy will increase the financial return for initiatives that reduce diesel fuel, gasoline, and natural gas consumption. An increase in financial return may help make conservation initiatives financially viable earlier than previously anticipated in the Plan.

Region's Green Energy Reserve Fund will help offset the financial impact of future renewable energy and conservation projects

Renewable energy and conservation projects can require additional capital to complete, which puts them at a financial disadvantage over competing options. To offset the financial impact, and in recognition of the environmental benefits of renewable energy and conservation projects, Council approved the Green Energy Reserve Fund (Bylaw No. 2016-78) in [December 2016](#) with funds allocated to Reserve from revenues as determined appropriate by Council. All contributions to the Reserve will be brought forward as part of the annual budget process.

6. Local Municipal Impact

Region will collaborate with local municipalities to share experience and best practices

The Region will continue to collaborate with local municipalities to exchange information, share best practices, and compare initiatives for reducing energy consumption and greenhouse gas emissions.

Energy management activities and sustainable practices benefit residents and local municipalities

The International Council for Local Environmental Initiatives Canada estimates that emissions from both upper and lower tier municipal operations account for between one and three per cent of total community greenhouse gas emissions. To reduce corporate emissions, target reductions and conservation initiatives are set in the Energy Conservation and Demand Management Plan. The annual Corporate Energy Report informs Council as to the progress that the Region is making in meeting these targets. Regional energy management activities benefit residents and local municipalities by reducing operating costs and demands on infrastructure, mitigating environmental impacts, and promoting sustainable practices, which promotes health and a healthier York Region.

7. Conclusion

Emission trends on track with 2021 target in the Energy Conservation and Demand Management Plan

In 2016, Regional energy costs totalled \$48.5 million and produced 92,384 tonnes of greenhouse gas emissions; or 77.8 kg for each York Region resident. Total emissions are growing 2.5 per cent slower than forecasted in the Energy Conservation and Demand Management Plan due to the current conservation efforts undertaken by all Regional departments. Greenhouse gas emission trends in 2016 are on track with the 2021 target in the Energy Conservation and Demand Management Plan and align with Vision 2051 objectives.

For more information on this report, please contact David Szeptycki, Director of Strategy and Innovation at 1-877-464-9675 ext.75723 or John Sherin, Manager of Climate Change and Energy Conservation at ext. 75316.

The Senior Management Group has reviewed this report.

May 25, 2017

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Accessible formats or communication supports are available upon request