

Clause 8 in Report No. 8 of Committee of the Whole was adopted, without amendment, by the Council of The Regional Municipality of York at its meeting held on May 19, 2016.

8

Energy Conservation and Demand Management Plan Update

Committee of the Whole recommends:

1. Receipt of the presentation by David Szeptycki, Head of Strategy, Liaison and Policy Implementation and Theresa MacIntyre-Morris, Manager, Climate Change and Energy Conservation, Environmental Services.
2. Adoption of the following recommendations contained in the report dated April 21, 2016 from the Commissioner of Environmental Services:
  1. Council endorse the Energy Conservation Demand Management Plan Update.
  2. Staff be directed to report back to Council in 2017 with a proposed update to the Regional Policy for LEED® certified buildings to include enhanced energy performance standards.

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Report dated April 21, 2016 from the Commissioner of Environmental Services now follows:

1. Recommendations

It is recommended that:

1. Council endorse the Energy Conservation Demand Management Plan Update.
2. Staff be directed to report back to Council in 2017 with a proposed update to the Regional Policy for LEED® certified buildings to include enhanced energy performance standards.

## 2. Purpose

The purpose of this report is to request Council endorsement of the Energy Conservation and Demand Management Plan Update. Public agencies, including municipalities, are required to complete and implement Energy Conservation and Demand Management Plans through the *Green Energy Act, 2009* and Ontario Regulation 397/11.

## 3. Background

Focus of the Energy Conservation and Demand Management Plan Update is to reduce greenhouse gas emissions from York Region's operations

According to Environment Canada, in 2012 Canada contributed 1.6 per cent of global greenhouse gas emissions. The International Council for Local Environmental Initiatives Canada estimates typical municipal operations amount to an estimated one to three per cent of total community greenhouse gas emissions.

Greenhouse gas emissions in York Region come from a variety of sources including delivery of the Region's services such as: treating and pumping drinking water and wastewater; vehicles for Transit, Police, Paramedic Services, and other vehicles; heating, cooling and lighting Regional buildings; and staff driving to meetings and various operations. Through the *Green Energy Act, 2009* and Ontario Regulation 397/11, York Region is required to develop and implement an Energy Conservation and Demand Management Plan with a focus on setting targets and identifying programs to reduce greenhouse gases from municipal operations.

The Region submitted a high-level Plan to the Ministry of Energy in 2014. This Energy Conservation and Demand Management Plan Update (Plan Update) provides more detail, outlining targets and specific program measures to meet *Green Energy Act, 2009* and Ontario Regulation 397/11 obligations. A copy of the Plan Update's Executive Summary is attached to this report (Attachment 1).

Cohesive strategy developed through collaborative efforts across the corporation, Housing York Inc., and York Regional Police

The Plan Update was developed through multi-stakeholder workshops and one-on-one meetings with every department, Housing York Inc., and York Regional Police. The final result is a cohesive strategy and commitment to work toward a common goal and actions identified in Vision 2051. The Plan Update builds on existing Regional commitments by charting a course forward with specific

initiatives and opportunities for the Region to move toward zero greenhouse gas emissions by 2051. The Plan Update and its initiatives are designed to maintain or increase the quality of life and working conditions for residents and Regional staff.

Emissions from activities that are directly or indirectly within Regional control are targeted for reduction

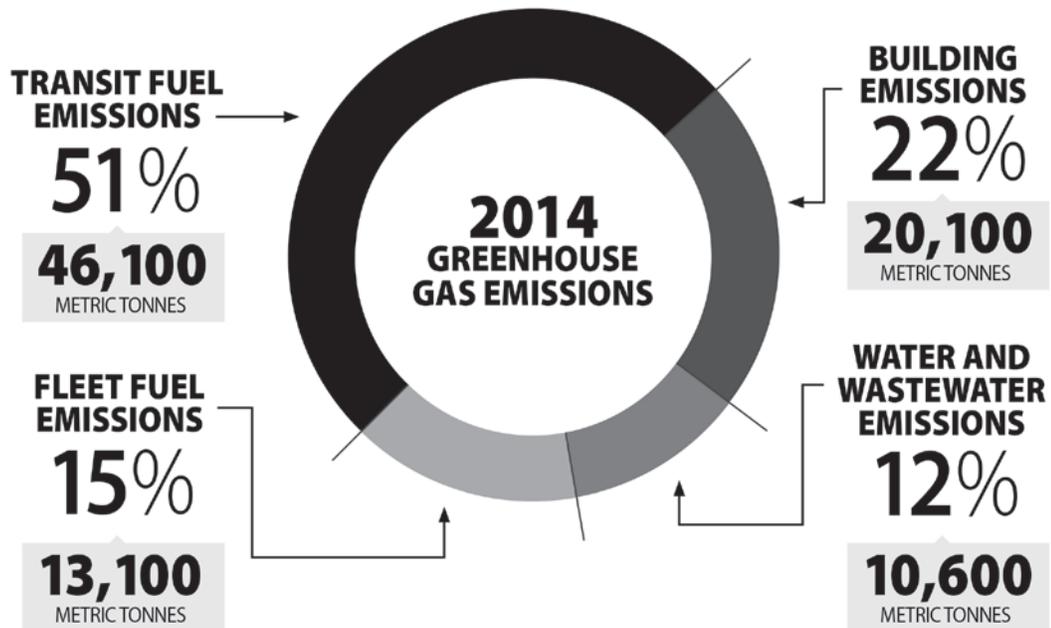
This Plan Update targets emissions within the Region's direct control, such as vehicles and buildings owned and operated by the Region, and indirect control, such as buildings owned by the Region but operated by a third party. Emissions from services purchased by the Region, such as construction contracts and purchased goods, are currently outside of the scope of the Plan Update. Future updates will consider work required to influence these emissions through provisions in contracts established through the Region's procurement process.

#### 4. Analysis and Options

Greenhouse gas emissions totalled approximately 89,900 tonnes in 2014 and continues an upward trend

Greenhouse gas emissions from Regional sources continued to increase in 2014. Early actions and investments in energy conservation implemented by the Region including LEED<sup>®</sup> Silver certification for new buildings, building audits, retrofits, energy efficient fleet vehicles including Transit, and hybrid vehicles have managed to slow the annual increase. This highlights that there is more the Region needs to do to slow and reverse the trend and move toward zero greenhouse gas emissions. Figure 1 below provides a breakdown of the 2014 greenhouse gas emissions from York Region operations. As in past years, vehicle emissions from Transit, Paramedic Services, York Regional Police, and other vehicles are the largest contributors to corporate greenhouse gas emissions.

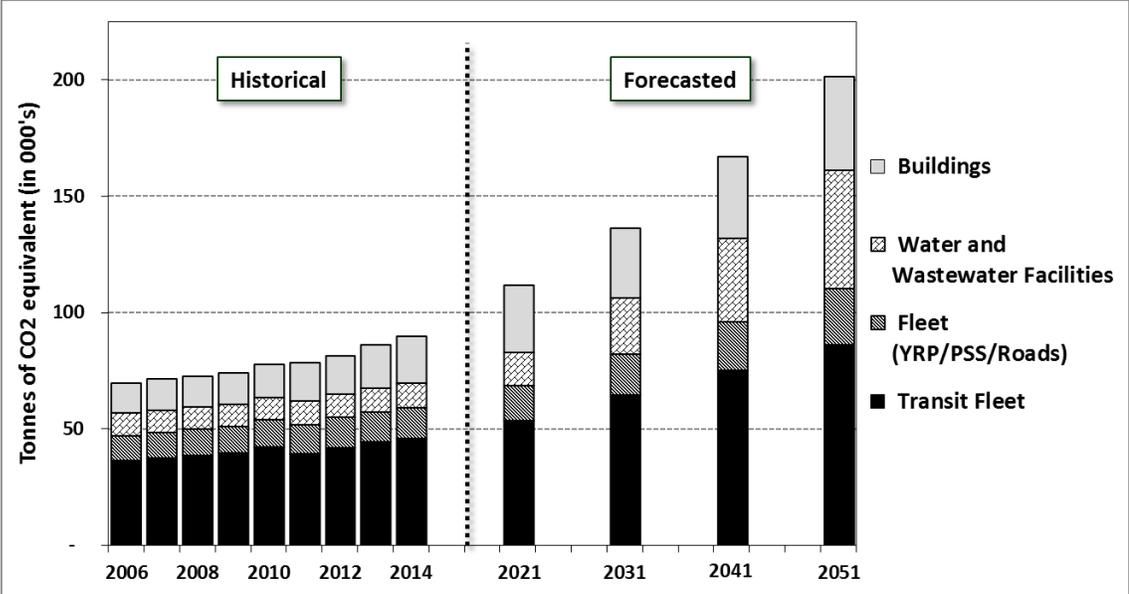
**Figure 1**  
**2014 Corporate Greenhouse Gas Emissions**



Without a cohesive corporate strategy, Regional greenhouse gas emissions are projected to more than double 2014 levels by 2051

The Plan Update is conservative with its estimates and projections. If the Region continues to operate as it does today, greenhouse gas emissions are forecasted to grow from 89,957 tonnes in 2014 to 201,500 tonnes in 2051, to meet the service needs of a growing population. Figure 2 below shows the forecasted emissions based on the Region's capital plans and population projections.

**Figure 2**  
**Projected Greenhouse Gas Emissions**  
**from York Region Operations and Services**



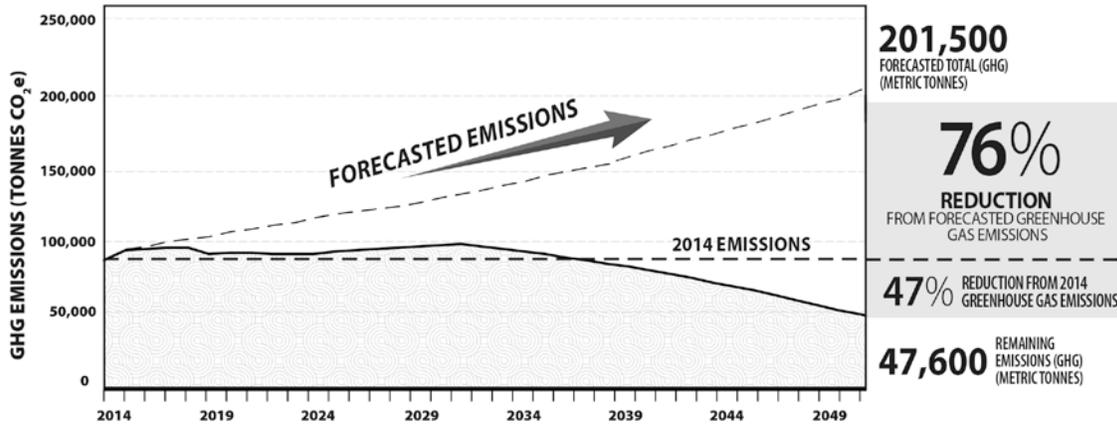
The Plan Update relies upon energy efficiency and switching to energy sources with low greenhouse gas emissions

The Plan Update outlines initiatives that, if successfully implemented, the Region will achieve a 76 per cent reduction of forecasted 2051 emissions depicted above and a 47 per cent reduction below 2014 total emissions by 2051. Remaining greenhouse gas emissions, approximately 47,600 tonnes, will be produced mainly from electricity and natural gas required for water and wastewater processes; lighting, heating, and cooling buildings; and powering vehicles.

Moving toward zero emissions will rely on emergent technologies becoming mainstream

Moving closer to zero emissions by 2051 is dependent upon future implementation of new technologies. The Energy Conservation and Demand Management Plan will be updated in 2019 and every five years subsequently. Each update will evolve with emerging technologies and will explore viable and cost-effective technology options for integration into Regional service delivery. Figure 3 below shows forecasted emissions with estimated reductions based on future actions outlined in the Plan Update.

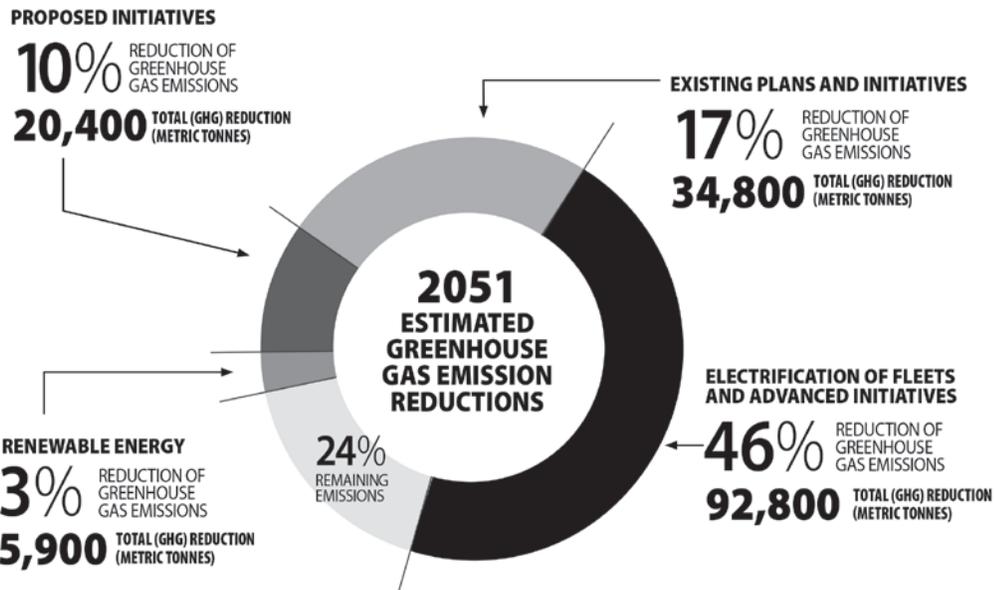
**Figure 3**  
**Forecasted Corporate Emissions and Reductions**



Plan Update proposes building upon existing plans and initiatives

The Plan Update identifies energy conservation measures that build upon existing plans and initiatives focused on buildings, non-transit fleets, transit fleets, and water and wastewater processes, each is discussed below. Electrification of fleet and advanced initiatives will be required to move the emissions trend downward. Figure 4 below shows a breakdown of 2051 estimated emissions reductions.

**Figure 4**  
**2051 Estimated Corporate Emissions Reductions by Category**



## EXISTING PLANS AND INITIATIVES

Targets up to 2031 are largely based upon existing plans and initiatives and contribute to 17 per cent of the overall 2051 reduction target

Existing plans and initiatives are those that have already been identified by departments, Housing York Inc. or York Regional Police. These initiatives are largely included in existing capital and operating forecasts. All of these initiatives are near-term actions within each program area and support the 2021 and 2031 targets proposed later in this report. By 2051 these initiatives are projected to account for 17 per cent of the Region’s corporate greenhouse gas emissions reductions. Table 1 below provides highlights of these initiatives by theme.

**Table 1**  
**Existing Plans and Initiatives by Theme**

Theme	Program Components
Buildings	<ul style="list-style-type: none"> <li>• LEED® Silver Policy</li> <li>• Continuous energy audits and retrofits</li> <li>• Housing York Inc. tenant education programs</li> </ul>
Non-Transit Fleets	<ul style="list-style-type: none"> <li>• Vehicle replacement with efficient models</li> </ul>
Transit Fleets	<ul style="list-style-type: none"> <li>• Driver education and efficiency training</li> <li>• InIT driver monitoring software</li> <li>• Buses replaced with more fuel efficient models</li> <li>• Anti-idling policy</li> </ul>
Water and Wastewater Processes	<ul style="list-style-type: none"> <li>• Water conservation</li> <li>• Process optimization</li> <li>• Facility audits and retrofits</li> </ul>

## PROPOSED INITIATIVES

Proposed initiatives support 2021 and 2031 targets and contribute 10 per cent toward long-term reduction goal

Proposed initiatives build upon Existing Plans and Initiatives and require operational or policy changes before they can be implemented. Capital budget impacts are anticipated to be minimal for these initiatives because they rely largely on staff time rather than capital investments.

These initiatives account for 10 per cent of the projected 2051 corporate greenhouse gas emissions reductions. Table 2 below provides highlights of these initiatives by theme.

**Table 2  
Proposed Initiatives by Theme**

Theme	Program Components
Buildings	<ul style="list-style-type: none"> <li>• Continued refinement of Regional technical standards</li> <li>• Energy retrofits to all Housing York Inc. buildings</li> <li>• Implementation of Total Operations Performance programs through enhanced staff education</li> </ul>
Non-Transit Fleets	<ul style="list-style-type: none"> <li>• Enhancement of policies (i.e. vehicle right sizing, corporate anti-idling, personal vehicle use, etc.)</li> <li>• Efficient driver training programs</li> <li>• Enhanced virtual meeting technology</li> </ul>
Transit Fleets	<ul style="list-style-type: none"> <li>• Transmission software upgrades</li> <li>• Cooling fan replacement project</li> </ul>
Water and Wastewater Processes	<ul style="list-style-type: none"> <li>• Continuous facility energy audits and benchmarking</li> <li>• Further process optimization and micro-generation</li> <li>• Heat recovery</li> </ul>
Street Lights	<ul style="list-style-type: none"> <li>• Convert all Region operated streetlights to light-emitting diode (LED)</li> </ul>

## RENEWABLE ENERGY

Solar photovoltaic energy generation will help meet Regional strategies and plans and contribute 3 per cent reduction toward 2051 target

The Region currently has five Feed-In Tariff contracts with the Independent Electricity System Operator capable of producing 218 kW of solar derived electricity at Regional facilities, which is enough to power 24 homes. This Plan Update recognizes that renewable energy projects position the Region as an environmental leader. It also recognizes that revenues produced by these investments provide a stream of income that can be utilized to fund future emission reduction initiatives.

Feed-In Tariff programs may not continue to be available; however, electricity costs will likely continue to rise in the long term. Providing onsite energy

generation through solar arrays will help offset rising electricity costs. It is estimated that 20-year lifecycle costs of a solar array will cost less than the same electricity provided through a local utility while contributing to the Region's objective of moving toward zero greenhouse gas emissions. In addition, the Regional Official Plan encourages all new buildings to include on-site renewable or alternative energy systems, which produce 25 per cent of building energy use, with zero emissions.

## ELECTRIFICATION OF FLEETS AND ADVANCED INITIATIVES

While not fully mature yet, electric vehicle technology and other advanced initiatives are anticipated to contribute up to 46 per cent reduction toward 2051 target

In 2014, two-thirds of the Region's corporate emissions were from vehicle emissions (Transit, Police, Paramedic Services, and other vehicles). By 2051, this proportion will fall to approximately half of the Region's forecasted annual greenhouse gas emissions. For this reason, electrification of fleet initiatives represents the greatest opportunity for the Region to impact future corporate greenhouse gas emissions. In the near-term, fleet electrification will be limited to non-emergency vehicles until technology is proven to meet service expectations and legislation allows for it to be expanded to emergency vehicle use.

Battery and electric vehicle technologies are advancing

Advancements in battery and electric vehicle technologies have occurred over the past decade. Market trends appear to indicate better technologies will start to have an impact on the Region's greenhouse gas emissions in the next decade. This Plan Update assumes that in-field demonstrated performance and legislation will allow for this technology to be used in emergency vehicles where traditional fuels such as gasoline and diesel are currently prescribed.

To minimize the budget impact for conversion, it is recommended that the Region monitor performance and lifecycle costs of emerging vehicle technology and introduce next generation technologies through planned replacement cycles. To date, less than one per cent of the Region's non-emergency fleet vehicles are hybrid or electricity powered. Table 3 provides highlights of advanced initiatives for electrification of fleets and increasing building energy efficiency.

**Table 3  
Electrification of Fleet and Advanced Initiatives**

Theme	Program Components
Non-Transit Fleets	<ul style="list-style-type: none"> <li>• Electric/hybrid corporate motor pool</li> <li>• Convert emergency vehicles to electric or hybrid once technology is proven and legislation permits the use of these technologies</li> <li>• Green fleet coordinator</li> </ul>
Transit Fleets	<ul style="list-style-type: none"> <li>• Transition to alternative fuels (compressed natural gas, diesel/hybrid, fuel cell, etc.) as part of normal replacement cycle</li> <li>• Plan Update recommends full electric once technology has been proven</li> </ul>
Buildings	<ul style="list-style-type: none"> <li>• Update LEED® Policy to adopt even higher levels of technical standards that impact energy efficiency</li> </ul>

Transit reduces community greenhouse gas emissions by reducing number of vehicles on the road

Regional transit fleets (including buses and mobility vehicles) generated 51 per cent of the Region’s total 2014 greenhouse gas emissions. These emissions, however, are absolute and do not factor in the societal benefits of reducing the number of single occupant vehicles that are displaced by transit riders. In 2014, the offset from transit emissions was estimated to be approximately 40,000 tonnes of greenhouse gases.

Converting transit vehicles to electric will start in 2025 and occur over the following 26 years as technology matures and capital investment costs decrease

Transit vehicle emission reductions are key to reducing overall emissions and achieving aspirational targets presented in this report. Advancements in battery and alternative fuel technology for buses indicate that these technologies can be incorporated into future transit fleet plans. Until a viable alternative technology is able to replace diesel buses, it is important that any long-term transit plans be flexible enough to integrate alternative technologies into transit operations.

## REMAINING EMISSIONS

Natural gas and electricity consumption in 2051 will result in some remaining greenhouse gas emissions

Initiatives identified in the Plan Update rely on energy conservation, efficiency and alternative energy sources. Regional operations will continue to require energy be consumed in the form of electricity and natural gas to deliver services. Emissions from these sources in 2051 are projected to be approximately 47,600 tonnes.

Ontario's electricity grid, while not within the Region's direct control, will help move the Region toward zero greenhouse gas emissions

The Plan Update relies heavily upon a transition away from fossil fuels for vehicle operations and proposes to replace them with electricity. A portion of Ontario's electricity is produced from natural gas generators, which means that grid supplied electricity consumed by the Region will still emit greenhouse gases. As well, natural gas is expected to remain the most efficient means for heating in the foreseeable future. It is possible that emergent technologies will displace either or both of these sources, which further reduce future Regional emissions and put additional downward pressure on the 2051 target. The Plan Update relies on actionable change that is within the Region's control therefore, changes to sources supplying Ontario's electricity grid are not included in the emissions forecasts.

## IMPLEMENTATION, COMMUNICATION, AND EDUCATION

Steering Committee will oversee implementation of the Energy Conservation and Demand Management Plan Update

The Plan Update recommends a Steering Committee be developed composed of decision-makers from across the Region, Housing York Inc., and York Regional Police to guide and oversee execution of energy conservation initiatives. Three working groups are also recommended (Water and Wastewater, Green Buildings, and Green Fleet) to share knowledge and experiences, as well as support implementation of successful initiatives in other departments. It is expected that specific projects will be analyzed and developed by the working groups and the Steering Committee will oversee implementation of the Plan.

Communication and education are key supports to delivering successful conservation programs and evolving the Plan Update

Ongoing communication will be vital to success moving forward. Staff will participate in industry working groups and continue liaison with local municipal and Regional partners to communicate energy use trends, promote Regional successes, and gain insight on new energy conservation initiatives. As staff move forward to update the Energy Conservation and Demand Management Plan for the next submission in 2019, engagement in external partnerships will help evolve the scope of the plan on issues, including green procurement.

### CORPORATE EMISSIONS TARGETS

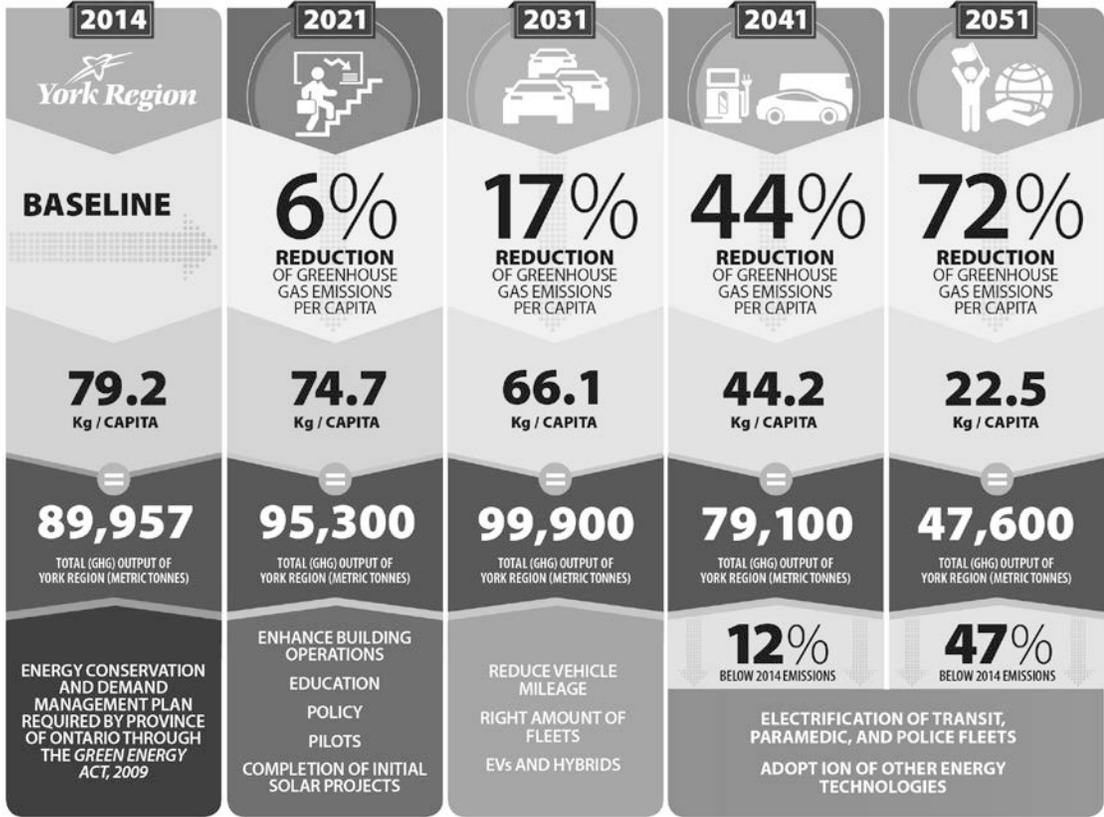
Four milestone conservation targets have been defined for corporate greenhouse gas emissions to 2051

The Plan Update has identified four milestone conservation targets for energy initiatives and greenhouse gas emissions reductions. Reporting to Council of annual emissions as compared to Plan targets is recommended through the Annual Corporate Energy Report.

York Region is a growing municipality, therefore service needs will continue to increase along with our population through to 2051. Total greenhouse gas emissions from York Region operations will also continue to increase over the next several years but at a slower rate than if the Region did not implement the Plan Update. Total emissions are expected to fall below 2014 emissions in 2037. To show the impact of the Plan Update, staff recommend two types of targets to measure emissions: a comparison to total residents served and absolute targets. Per capita targets are an effective way for growing municipalities to show impact of their efforts even though total emissions continue to increase.

Figure 5 below identifies these targets for corporate greenhouse gas emissions.

**Figure 5  
Milestones and Targets for Corporate Greenhouse Gas Emissions**



The Plan takes a conservative approach to emissions reductions, which ensures targets are achievable and that emergence of new technologies will increase potential for the Region to exceed these targets. Plan updates will be prepared every five years as required by the *Green Energy Act, 2009* and Ontario Regulation 397/11.

Link to key Council-approved plans

Reducing greenhouse gas emissions and increasing energy conservation are specifically highlighted in a number of Council objectives, policies and actions. Initiatives proposed in the Plan Update 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. The Plan Update effectively sets a 35-year vision for energy conservation that pulls together near-term program priorities and sets targets that align with many of the Region’s existing priorities.

## 5. Financial Implications

Financial impacts on existing capital budgets are minimized by using existing departmental plans and replacement cycles

The Plan Update is designed to minimize the financial impact on existing capital budgets by leveraging existing plans and planned asset replacement cycles. As part of the ten year capital and four year operating plans, Corporate Energy Services has budgeted for energy audits (with the exception of Housing York Inc. and water/wastewater processes), building system upgrades, solar array installation and maintenance, strategy updates, and retrofits that occur before the end of existing equipment useful life. Non-transit fleet, transit fleet, water and wastewater processes, new building design and construction, building operations, education, and Housing York Inc. programs are budgeted through each department as part of their capital and operating plans.

The Plan Update proposes a business case be developed to assess the viability of each initiative using a triple-bottom line approach. In addition to capital costs, operating costs for each initiative will be specifically quantified in each business case and are expected to be funded through revenues or savings from each project or through Provincial and Federal funding programs, where possible. Estimated capital costs listed in Table 4 below are incremental to those already budgeted through 2016 to 2025. Any future funding needs will be included in annual budget requests considered as part of the 2017 and beyond budget processes. The Transportation Master Plan Update currently underway includes incremental costs for electrification of Transit fleet in the long term. Based on a business case analysis, implementation will be considered as part of future budget approval processes.

**Table 4  
Preliminary 2016 to 2025 Financial Analysis\***

Category	Incremental Capital Budget Cost (\$)		Estimated Total Energy Cost Savings (\$)	Estimated Annual Energy Cost Savings (\$)
	2016 to 2020	2021 to 2025	2016 to 2025	Beyond 2025
Existing Plans and Initiatives	0.2M	0.4M	14.3M	3.5M
Proposed Initiatives	6.8M	19.6M	44.2M	6.7M
Renewable Energy	19.1M	15.9M	13.0M	2.4M
Advanced Initiatives	0.1M	33.3M	32.0M	8.9M

\*Excludes operating costs impacts associated with capital, which will be quantified and assessed as part of future business case analysis.

The Plan Update initiatives identified a total of \$95 million in capital investment from 2016 to 2025. Expected energy cost savings from these investments are projected to save the Region \$104 million over the same period, with an estimated annual savings of \$22 million per year beyond 2025 for the life of each measure. Between 2016 and 2025 the Region is estimated to spend \$775 million on energy (electricity, natural gas, diesel fuel, gasoline, and propane) to deliver services. While these estimates are preliminary they do serve as a good basis for more detailed business case analysis on each of the identified initiatives.

Costs and savings beyond 2025 are difficult to estimate because the Plan Update relies on the advancement of technologies (i.e. battery and fuel cell) to achieve proposed emissions targets and energy costs in these out years. It is expected that as today's "advanced technology" becomes mainstream, costs will also adjust to levels that compete with current technologies. Business cases are intended to be developed for each initiative and assessed before implementation. The proposed provincial Cap and Trade program is expected to increase energy costs.

Cap and Trade will impact Regional operating budgets that rely on fossil fuel consumption for delivery of services. Natural gas, gasoline, and diesel fuels are proposed to have additional per-unit charges included in their price. Early estimates indicate that the Region's cost of gasoline and diesel fuels could increase by \$1.3 million in 2017, when the proposed Provincial Cap and Trade program is expected to take effect. However, when fuel prices increase above the wholesale price of \$1.15 per litre, additional costs may be temporarily mitigated through the Fuel Cost Stabilization Reserve. Natural gas costs are expected to increase by \$107,000 in 2017. Because there is no reserve fund for this fuel expense, the additional cost will have to be met through adjustments to operating budgets. It is anticipated that energy conservation will have multiple benefits, reducing: Regional greenhouse gas emissions, the financial impact of Cap and Trade, and impacts from increasing service demands from a growing population.

Proposed Cap and Trade legislation will include provisions for funding greenhouse gas emission reduction initiatives. This funding may be available to the Region to offset some of the costs proposed for initiatives in this Plan Update.

A green energy fund will support pilot projects and future renewable energy projects

As much as possible, the Energy Conservation and Demand Management Plan Update tries to use existing departmental plans and initiatives because these are already considered in existing long-term capital budgets. To offset incremental financial impacts that some initiatives will have, the Plan Update establishes a green energy fund. Potential sources of money to contribute to the fund are

revenues from solar electricity generating installations and annual contributions approved by Council through the budget process.

Alternative funding mechanisms will be continuously pursued to help offset program costs. Anticipated funding opportunities include Provincial and Federal stimulus programs, the Federation of Canadian Municipalities, the Province's Electric Vehicle Incentive Programs, and the Electric Vehicle Chargers Program. Bill 172, the proposed Climate Change Mitigation and Low-Carbon Economy Act, 2016 identifies infrastructure to support adoption and use of zero emission and plug-in hybrid vehicles as potentially qualifying for funding through the Greenhouse Gas Reduction Account, which is funded using proceeds from the Provincial Cap and Trade Program.

## 6. Local Municipal Impact

Local Municipalities are required to develop their own Energy Conservation and Demand Management Plans through the *Green Energy Act, 2009* and Ontario Regulation 397/11. Local Municipalities are also encouraged to develop Municipal Energy Plans through Ministry of Energy and the York Region Official Plan. Municipal Energy Plans include an inventory of community wide emissions, targets, and plans to reduce community greenhouse gas emissions. Municipal Energy Plans also consider impact of future growth and options for local clean energy generation, and supports local economic development. To date, Vaughan, Newmarket and Markham have initiated Municipal Energy Plans. The Region's Plan Update will provide a reduction in community greenhouse gas emissions and positively contribute to Municipal Energy Plans over the long term. In addition, efficient Regional operations will mitigate operating cost pressures and positively impact the end user, local municipality, residents, and businesses.

## 7. Conclusion

The Energy Conservation and Demand Management Plan Update meets requirements of the *Green Energy Act, 2009* and Ontario Regulation 397/11 and identifies opportunities for the Region to move toward actions and objectives outlined in Vision 2051 and the Regional Official Plan. Key milestones and targets have been established in this Plan to ensure that the Region is positioned in the near-term to meet these long-term objectives.

All Regional departments, Housing York Inc., and York Regional Police contributed to the development of the Plan and its initiatives. Building on the progress individual departments have both achieved and planned, the Plan Update components conservatively expect to reduce 2051 corporate emissions by 76 per cent over the next 35 years as compared to projected emissions,

70 per cent per capita, and 47 per cent below actual 2014 total emissions. While not included in the 2051 emissions target, it is anticipated the remaining 47,600 tonnes of greenhouse gas emissions may be further reduced by either offsets or advances in technology supplying electricity to Ontario's power grid.

For more information on this report, please contact David Szeptycki, Head of Strategy, Liaison and Policy Implementation at ext. 75723.

The Senior Management Group has reviewed this report.

April 21, 2016

Attachment

York #6737846

Accessible formats or communication supports are available upon request

# Executive Summary

## The Regional Municipality of York

### Energy Conservation and Demand Management Plan Update

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The following provides a summary of the Regional Municipality of York's Energy Conservation and Demand Management Plan Update (Plan Update). The Plan Update will be available on the York.ca upon endorsement by Council.

#### York Region's Commitment to Reducing Greenhouse Gas Emissions

York Region has a history of actively pursuing greenhouse gas (GHG) emission reductions; most notably through Vision 2051, a bold and innovative strategy to guide York Region in creating strong, caring and safe communities designed with sustainability in mind. As a key guidance document for Council, staff and the community, Vision 2051 defines a path towards a sustainable future. Living Sustainably, one of eight Vision 2051 goals, includes a series of objectives to reduce energy consumption and GHG emissions, including: strategies that support a low-carbon transportation system; new construction and retrofits that move towards zero carbon buildings; exploration of renewable and alternate energy generation; reduction of energy and GHG emissions in water and wastewater infrastructure; and fostering behaviour changes that reduce GHG emissions. All of these objectives are underpinned by an aspirational directive to "encourage initiatives that move toward zero greenhouse gas emissions by 2051." As such Vision 2051 provides the overarching direction and impetus to develop this Energy Conservation and Demand Management Plan Update.

Energy Conservation and Demand Management plans are required under the Ontario Regulation 397/11 and *Green Energy Act, 2009* that directs all public agencies in Ontario to prepare, publicly report, and implement Energy and Conservation Demand Management plans. An Energy and Conservation Demand Management Plan is commonly comprised of the following:

- A summary of the annual energy consumption and greenhouse gas (GHG) emissions for corporate operations;
- A description of the goals and objectives for conserving and reducing energy consumption and managing energy demand; and
- A description of previous, current and proposed actions to conserve energy and manage demand, including a forecast of expected results for current and proposed solutions.

Energy and Conservation Demand Management plans are designed to address energy and GHG emissions within municipal corporate operations only, and do not cover emissions at the community level. Other plans such as community energy plans or community climate action plans are those that address community-wide GHG emissions. Typically municipal GHG emissions represent 1 to 3 per cent of total community GHG emissions<sup>1</sup>.

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<sup>1</sup> International Council for Local Environmental Initiatives (ICLEI) Canada.

To fulfill requirements of Ontario Regulation 397/11 and *Green Energy Act, 2009* York Region developed and submitted an initial Energy and Conservation Demand Management Plan to the Ministry of Energy on July 1, 2014. The initial plan provided high level direction for the Region, while this Plan Update provides York Region’s specific program components that position the corporation as a leader in implementing concrete actions that significantly reduce emissions. The Plan Update is consistent with the Provincial reporting requirements of the *Green Energy Act, 2009* and forms the basis for a five-year operational review in 2019.

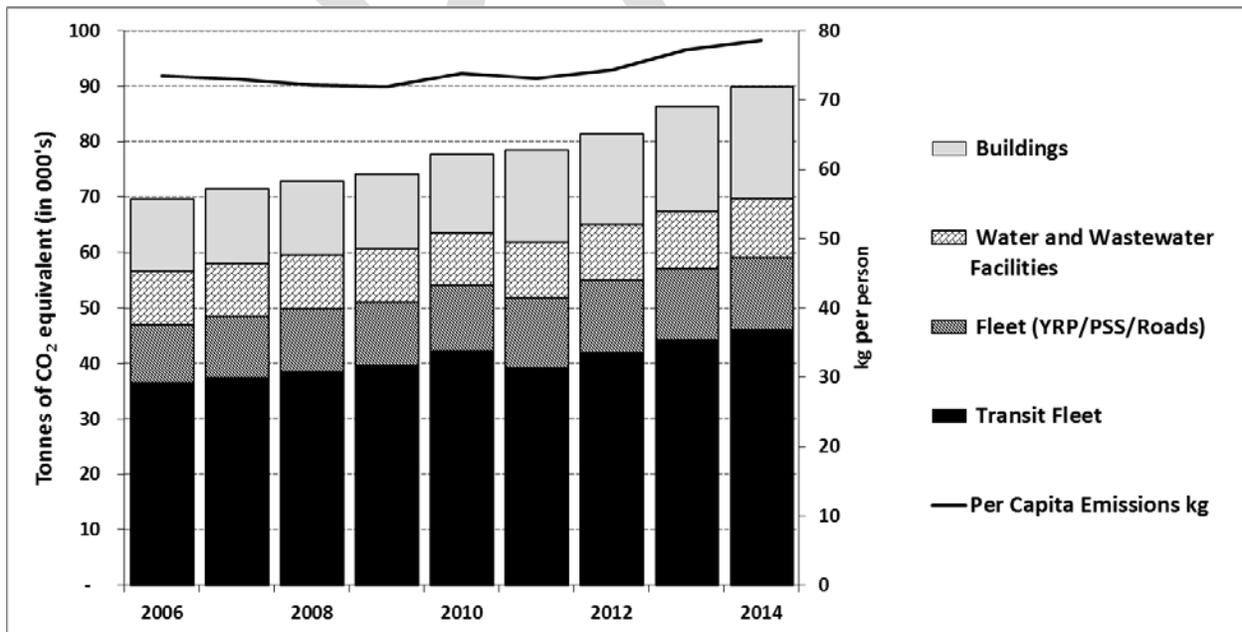
### York Region’s Current Activities and Greenhouse Gas Emission Levels

York Region has put in place a number of initiatives to reduce GHG emissions including integrating energy efficiency and GHG emission reductions in the Regional Official Plan (ROP 2010) policies as identified in Section 2.2. The Region also implements a minimum LEED® Silver standard for all new Regional buildings over 500 m<sup>2</sup> that has facilitated energy efficiencies across the building portfolio. Actions by corporate fleet, Police and Paramedic and Seniors Services have included replacing vehicles with more fuel efficient models and Transit has reduced personal vehicle use in the community through the provision of transit services.

Even with these progressive actions, corporate GHG emissions continue to increase as services are brought online to serve current and future population needs.

York Region first started to track corporate GHG emissions in 2006. The Region’s emissions have increased 29 per cent from 2006 to 2014 as illustrated in Figure 1 below. Over that same period the Region's population increased by 20 per cent meaning that per capita emissions grew by 7 per cent.

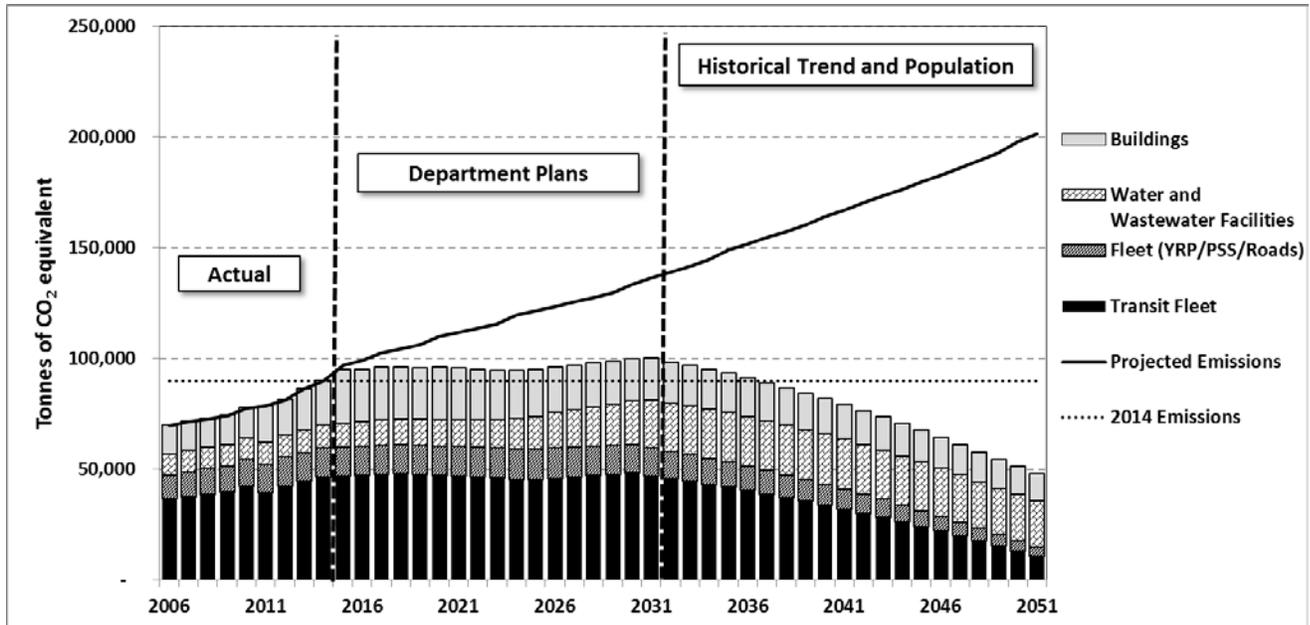
**Figure 1: Regional Emissions from 2006-2014**



In 2014, York Region emitted 89,957 tCO<sub>2</sub>e as shown in Figure 2. Considering that current population growth projections suggest the Region will grow from an estimated population of 1.16 million in 2015 to

1.59 million by 2031 and 1.79 million by 2041<sup>2</sup>, York Region can expect future GHG emissions to reach 201,500 tCO<sub>2</sub>e in 2051 if further action is not taken to curb emissions.

**Figure 2: Historical Trend (2014-2051)**



### Recommended Program Components

To plan for long-term actions needed to reduce emissions in 2051; the Plan Update goes above and beyond the regulatory requirements of five year planning and charts a course over a 35-year planning horizon to align with Vision 2051. The Plan Update provides a detailed five year and ten year plan through a series of program components and options categorized as: Buildings, Non-Transit Fleet, York Region Transit/Viva Fleet, Water and Wastewater, Intersection Lights, and Renewable Energy Generation (summarized in Table 1 through 6). These program components are designed to significantly curb emissions and move the Region toward its aspirational goal of zero GHG emissions.

<sup>2</sup> [York Region 2041 Preferred Growth Scenario](#), November 5, 2015 York Region, 2015, [2041 York Region Draft Growth Scenarios and Land Budget](#)

**Table 1: Plan Update Components: Buildings**

Initiative	Category	2020			2025	2051
		Incremental Budget Cost (\$)	Estimated Annual Energy Savings (\$)	GHG Reduction (tCO <sub>2</sub> e)	GHG Reduction (tCO <sub>2</sub> e)	GHG Reduction (tCO <sub>2</sub> e)
New Building Design (Silver Standard)	Existing	n/a	360,000	1,250	1,250	1,250
Existing Building Retrofits	Existing	n/a	140,000	330	580	1,900
HYI: New Buildings	Existing	n/a	n/a	n/a	60	1,500
Operations & Maintenance and Behaviour Change	Proposed	78,000 to 250,000	260,000	740	1,300	3,000
HYI: Retrofits	Proposed	1.5 to 3.7 Million	115,000	410	730	2,400
Building Retrofits	Proposed	1.4 Million	376,000	880	1,600	5,200
HYI: Operations & Maintenance	Proposed	41,500 to 132,000	16,000	40	80	370
Enhanced Energy Technical Standards	Advanced	n/a	n/a	n/a	n/a	5,600

**Table 2: Plan Update Components: Non-Transit Fleets**

Initiative	Category	2020			2025	2051
		Incremental Budget Cost (\$)	Estimated Annual Energy Savings (\$)	GHG Reduction (tCO <sub>2</sub> e)	GHG Reduction (tCO <sub>2</sub> e)	GHG Reduction (tCO <sub>2</sub> e)
Fuel Efficiency and Vehicle Replacement	Existing	n/a	42,000	160	320	220
Anti-Idling Policy	Existing	74,500	90,000	340	480	280
Efficient Driver Training	Existing	n/a	335,000	410	750	220
Personal Vehicle Use Reduction	Proposed	n/a	780,000	120	300	1,200
Electric Vehicles	Advanced	114,000	16,000	275	520	18,300

**Table 3: Plan Update Components: Transit Fleets**

Initiative	Category	2020			2025	2051
		Incremental Budget Cost (\$)	Estimated Annual Energy Savings (\$)	GHG Reduction (tCO <sub>2</sub> e)	GHG Reduction (tCO <sub>2</sub> e)	GHG Reduction (tCO <sub>2</sub> e)
Operator Behaviour (inIT Technologies)	Existing	170,000	226,000	1,500	5,600	1,280
In-Vehicle Technology (Voith SensoTop and electric fan)	Proposed	270,000	1.4 million	4,200	5,600	1,300
Electric Buses	Advanced	n/a	n/a	n/a	1,500	73,300

**Table 4: Plan Update Components: Water and Wastewater Processes**

Initiative	Category	2020			2025	2051
		Incremental Budget Cost (\$)	Estimated Annual Energy Savings (\$)	GHG Reduction (tCO <sub>2</sub> e)	GHG Reduction (tCO <sub>2</sub> e)	GHG Reduction (tCO <sub>2</sub> e)
Water Conservation	Existing	n/a	885,000	1,600	3,200	28,000
Optimizing Aeration of Sewage	Proposed	512,000	82,000	210	420	1,800

**Table 5: Plan Update Components: Street Lights**

Initiative	Category	2020			2025	2051
		Incremental Budget Cost (\$)	Estimated Annual Energy Savings (\$)	GHG Reduction (tCO <sub>2</sub> e)	GHG Reduction (tCO <sub>2</sub> e)	GHG Reduction (tCO <sub>2</sub> e)
Street Light Conversion to LED	Proposed	500,000	300,000	450	500	740

**Table 6: Plan Update Components: Renewables**

Initiative	Category	2020			2025	2051
		Incremental Budget Cost (\$)	Estimated Annual Energy Savings (\$)	GHG Reduction (tCO <sub>2</sub> e)	GHG Reduction (tCO <sub>2</sub> e)	GHG Reduction (tCO <sub>2</sub> e)
Solar Photovoltaic	Renewable	19 million	700,000	990	1,800	5,900

The recommended program components result in a 153,800 tCO<sub>2</sub>e reduction by 2051 (an equivalent to 47 per cent below 2014 levels and 76 per cent below modelled forecast emissions in 2051) as shown in Table 7. This leaves approximately 47,600 tCO<sub>2</sub>e remaining in 2051. Moving closer toward the aspirational target of zero emissions by 2051 is dependent upon future technology, which at this time is largely unknown.

**Table 7: Combined Regional Emissions Targets**

	2020	2025	2051
Historical Trend of Emissions (tCO <sub>2</sub> e)	109,800	121,500	201,500
Plan Update Target Emissions Reductions (tCO <sub>2</sub> e)	14,000	26,700	153,800
Reduction from the Modelled Forecast Emissions	13%	22%	76%

The recommendations made for the first five years (2016-2020) integrate relevant planned initiatives from each department and are based on solid estimates for GHG emission reduction potential from existing and proven technologies. During this term, there is a heavy emphasis on laying the ground work for creating a culture of conservation and establishing enabling policies for future initiatives.

Actions in the ten year (2021-2025) planning horizon, shift momentum toward the aspirational targets. These program components provide the Region with an opportunity to slow GHG emissions growth. Initiatives identified beyond 2025 are of a much more transformational nature. These initiatives are based on best available technology to date, but recognize that the business case for selecting specific technological solutions will be solidified in the coming years as more information becomes available.

Actions occurring at and beyond the 2025 planning horizon will significantly reduce emissions and will require commitment and investment to prioritize GHG emission reductions. These program components in conjunction with changes to federal and provincial legislation and regulations, as well as technological advances anticipated over the next decade, will impact long-range program components and further strengthen the Region's ability to reach its aspirational vision of zero emissions by 2051.

### Implementation

The Plan Update is required to be updated every five years (next update is due 2019) and is intended to guide York Region on its path toward zero GHG emissions over the next 35 years. The implementation framework focuses primarily on the five and ten year planning horizons and includes guidance for: Governance and collaboration; communications; benchmarking, measurement and verification; long-term planning and decision-making; procurement and purchasing; incentives and funding; reporting; recognition and plan renewal.

# Energy Conservation and Demand Management Plan Update

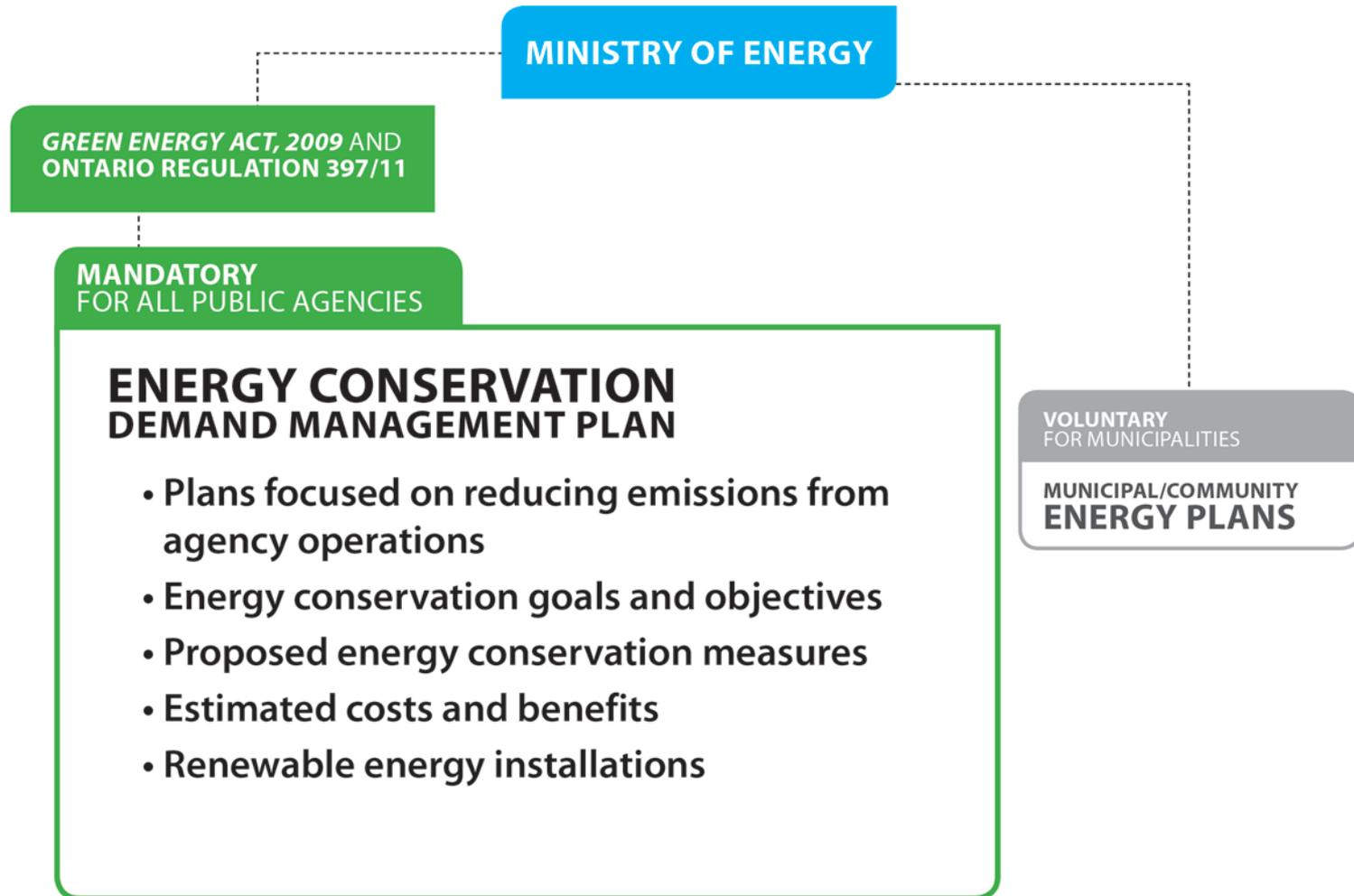
Presentation to  
**Committee of the Whole**

**David Szeptycki & Theresa MacIntyre-Morris**

May 5, 2016



# Plan Update Purpose



Plan Update focuses on reducing emissions from York Region operations

# Plan Update Objectives

- Meet *Green Energy Act* and Ontario Regulation 397/11 requirements
- Meet Council objectives and actions outlined in Vision 2051 and Regional Official Plan
- Develop a cohesive vision for all Regional lines of business across all departments
- Set targets for greenhouse gas emissions reduction
- Identify energy conservation programs and measures

Community & Health Services

Environmental Services

Transportation Services

Corporate Services

Finance

Transit

York Regional Police

Housing York Inc.

Plan Update provides a consolidated overview of Regional objectives and meets regulatory requirements

# Scope of Plan Update



Emissions within the Region's direct control are the focus of Plan Update initiatives

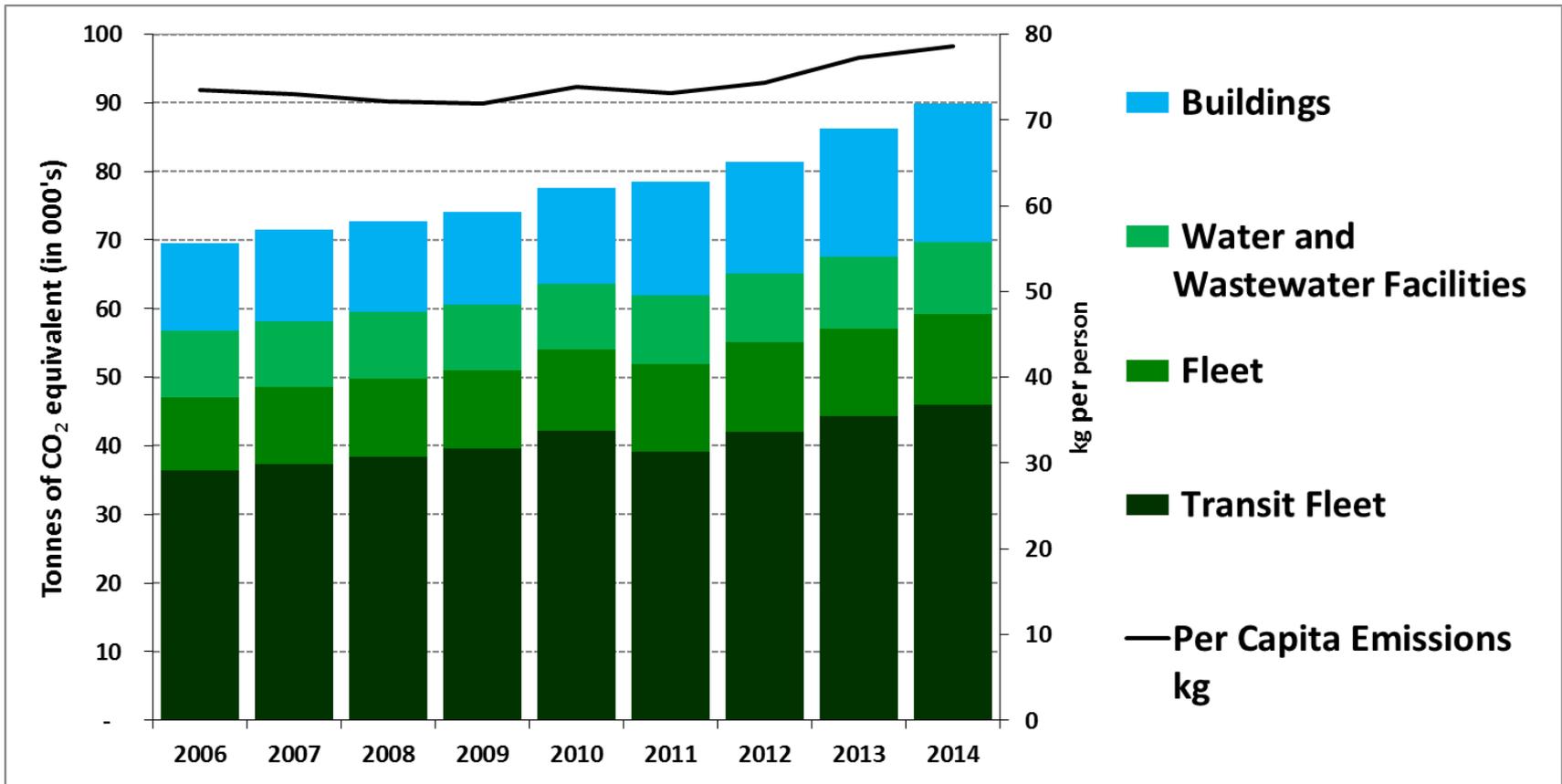
# Plan Development

- Best-in-Class review
- Forecast model
- Thematic workshops with stakeholders across all lines of business
- Identified long and short term initiatives to reduce greenhouse gas emissions



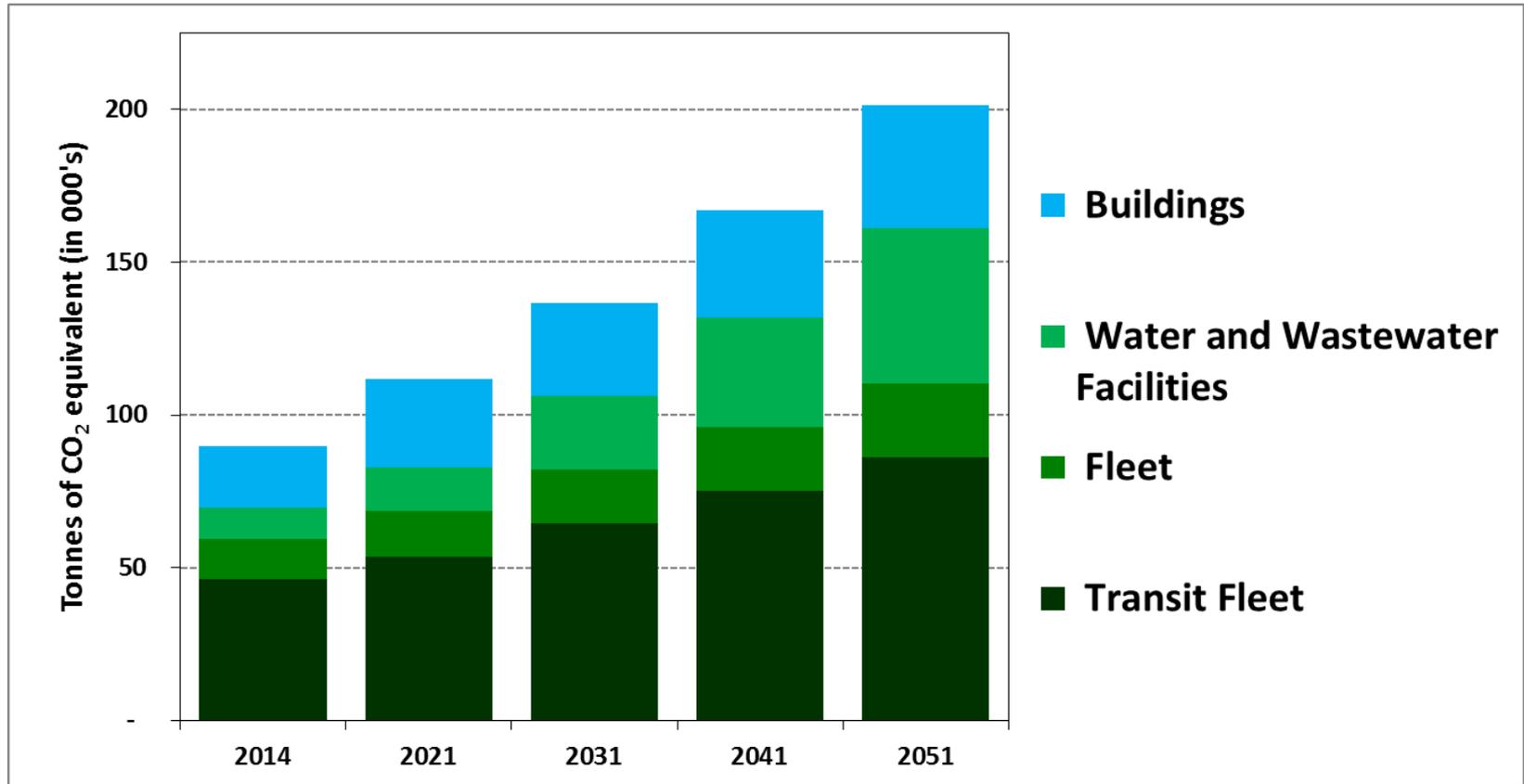
Stakeholders identified a workable plan that responds to the growth York Region continues to experience

# Regional Greenhouse Gas Emissions



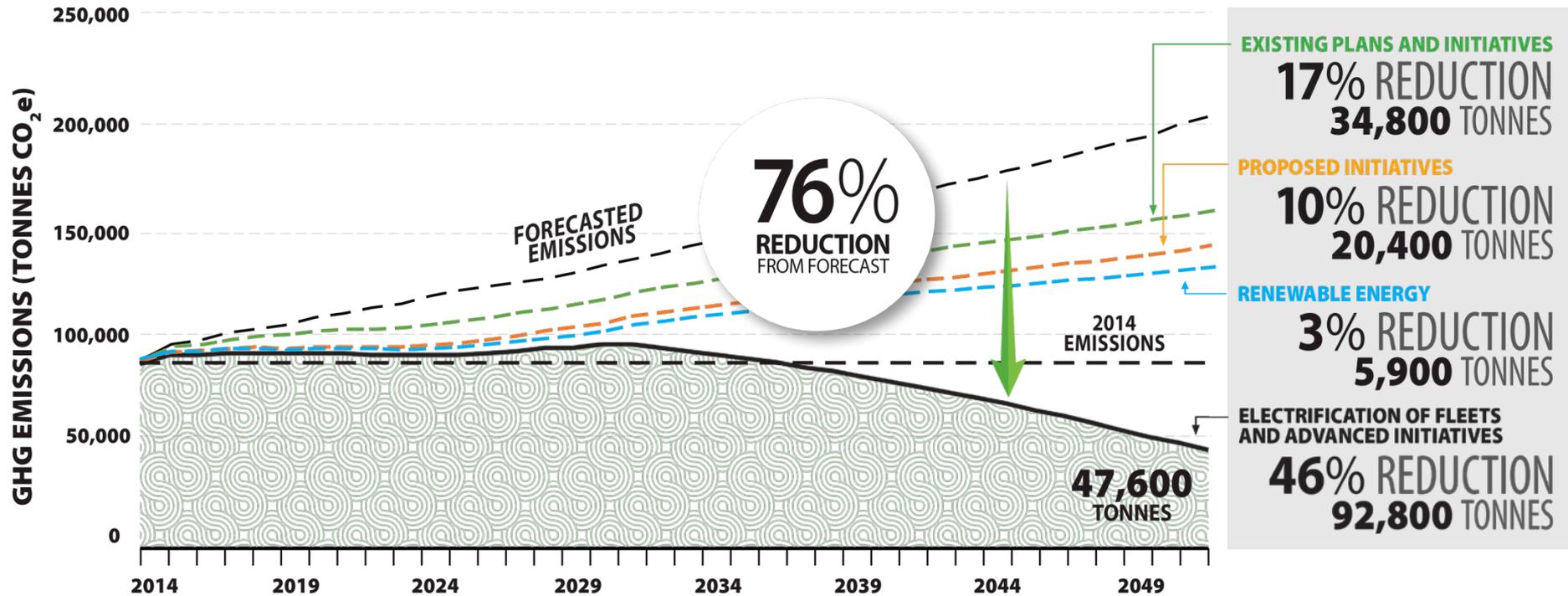
Emissions are growing faster than the population due to service delivery enhancements

# Forecasted Greenhouse Gas Emissions



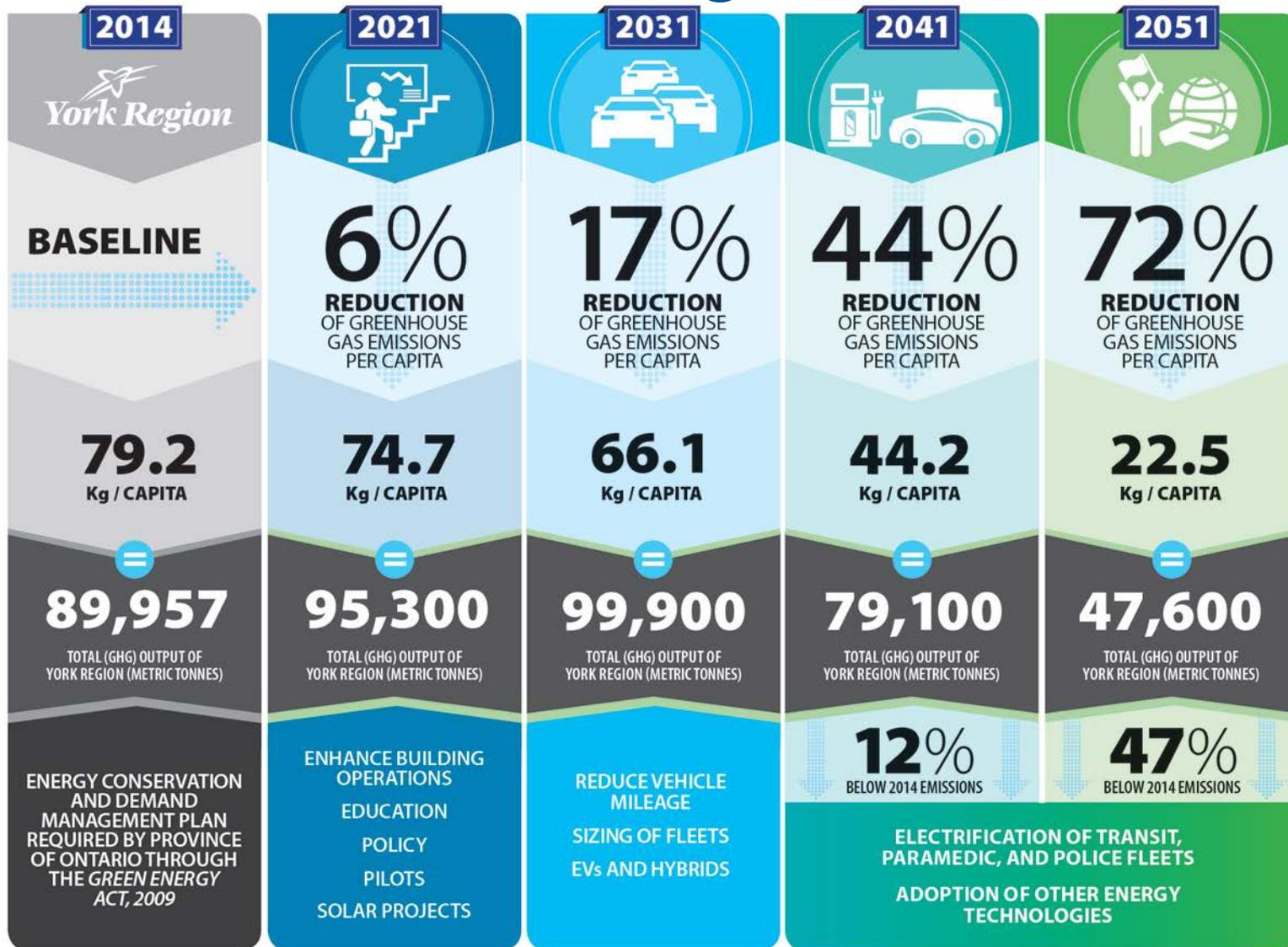
Emissions are predicted to grow without a cohesive reduction strategy across the corporation

# Plan Scenarios to Achieve 2051 Objectives



Implementing all initiatives will result in a 47% reduction from 2014 emissions by 2051

# Recommended Targets



It is anticipated that total emissions will trend lower than 2014 total emissions by 2037

# Comparison to other Energy Conservation and Demand Management Plans

PLAN COMPONENTS	YORK REGION	TORONTO	PEEL	DURHAM	HALTON	WATERLOO	NIAGARA	HAMILTON
Buildings	✓	✓	✓	✓	✓	✓	✓	✓
Water & Wastewater	✓	✓	✓	✓	✓	✓	✓	✓
Fleet	✓		✓				✓	✓
Transit	✓							✓
Street Lighting	✓					✓	✓	✓
Renewable Energy	✓	✓	✓	✓	✓	✓	✓	✓

ENERGY CONSERVATION AND DEMAND MANAGEMENT TARGETS								
Short Term	6% PER CAPITA BY 2021				10% BY 2020	10% BY 2019	5% PER CAPITA BY 2019	20% BY 2020
Long Term	47% BY 2051							80% BY 2050

The Plan Update set us up as leaders in the GTA as our targets covers the full spectrum of Regional services

# Implementing the Plan



Eligible sources of funding will be pursued to help fund energy conservation priorities

# Recommendations and Next Steps

- Council endorse the Energy Conservation and Demand Management Plan Update
- Staff develop policy changes and updates that support proposed initiatives

Plan Update provides a cohesive long term strategy to reduce greenhouse gasses from Regional operations