

Clause 11 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 28, 2018.

11

2017 Corporate Energy Report

Committee of the Whole recommends adoption of the following recommendation contained in the report dated May 25, 2018 from the Commissioner of Environmental Services:

1. This report be received for information.
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Report dated May 25, 2018 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 annual 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 in 2017 to achieve goals set out in the Energy Conservation and Demand Management Plan.

3. Background and Previous Council Direction

This Report informs Council about the Region's progress towards zero greenhouse gas emissions

The Energy Conservation and Demand Management Plan (the Plan), endorsed by Council on [May 19, 2016](#), established a corporate roadmap to reduce greenhouse gases, as required by the *Green Energy Act, 2009*. The Plan identifies projects and programs across corporate operations to achieve

incremental targets for greenhouse gas emissions over time. To stay in step with emerging knowledge and technology, the Plan is updated every five years, with the next update due in July 2019 as required by regulation 397/11 of the *Green Energy Act*.

Corporate-wide commitment, adoption and funding of new technologies such as electrified fleets and cost effective low-energy buildings are imperative to achieve zero corporate emissions by 2051

Vision 2051 set an aspirational goal for the Region to eliminate corporate greenhouse gas emissions by 2051. While the Plan moves the corporation closer to this goal, faster adoption of existing and future technologies and a more defined commitment across the corporation in the years to come are required to achieve this goal by 2051. Examples include electrification of corporate vehicle fleets and net-zero buildings.

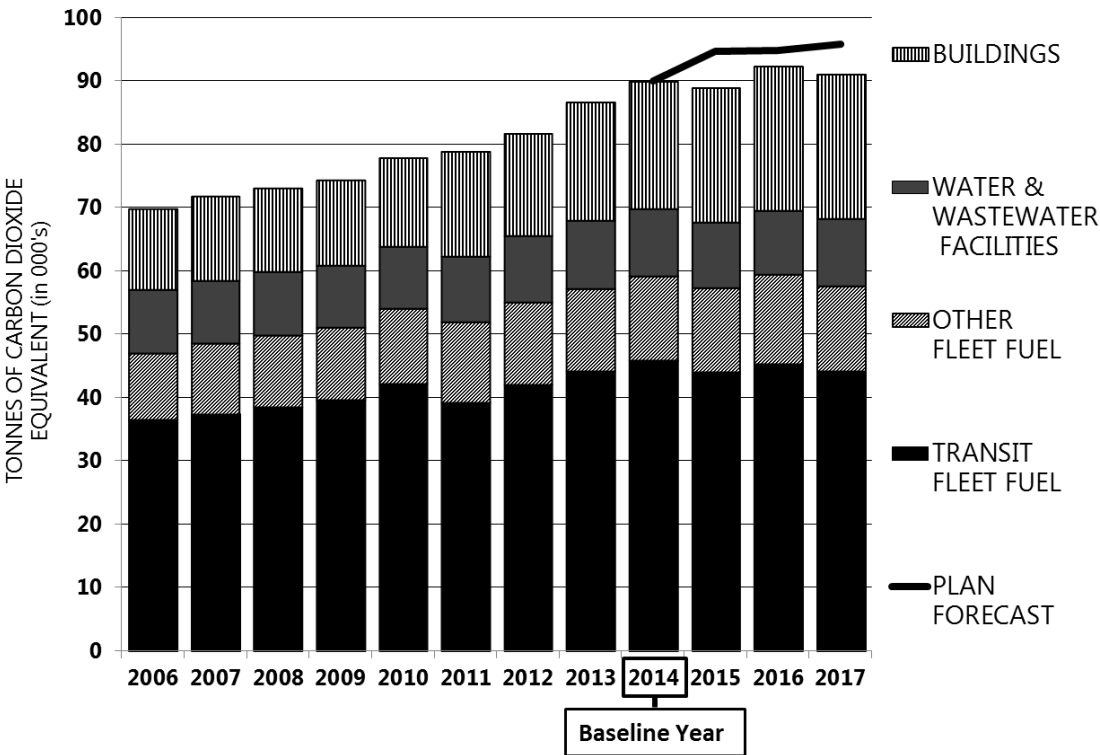
Persistent efforts across all departments, including working with local municipalities, federal and provincial agencies and external partners like Enbridge, Independent Electrical System Operator (IESO) and Canadian Urban Transit Research and Innovation Consortium (CUTRIC), require an innovative and collaborative mindset to realize these opportunities. Through Plan updates that incorporate emerging technologies and funding, actions to capitalize on these opportunities and close the gap, will be identified and drive the corporation closer to zero emissions. This collaborative mindset is evidenced by the electric bus pilot that is currently underway by Transit.

4. Analysis and Implications

Focused efforts achieved more reductions in corporate greenhouse gas emission in 2017 than forecasted

In 2017, greenhouse gas emissions from corporate activities were 90,999 tonnes; 5.1 per cent below the Energy Conservation and Demand Management Plan forecast for the same period. Early emission reductions were made possible by advancing the timelines for initiatives like ambulance anti-idling and hybrid technologies, reprioritizing budgets, and leveraging emerging opportunities from external partnerships. Continued efforts by all departments under the Energy Conservation and Demand Management Plan will further drive emissions reductions and energy efficiency across Regional service delivery. Figure 1 illustrates the trend and forecast of total emissions by source category from 2006 to 2017.

**Figure 1
Greenhouse Gas Emissions by Source Category, 2006 – 2017**



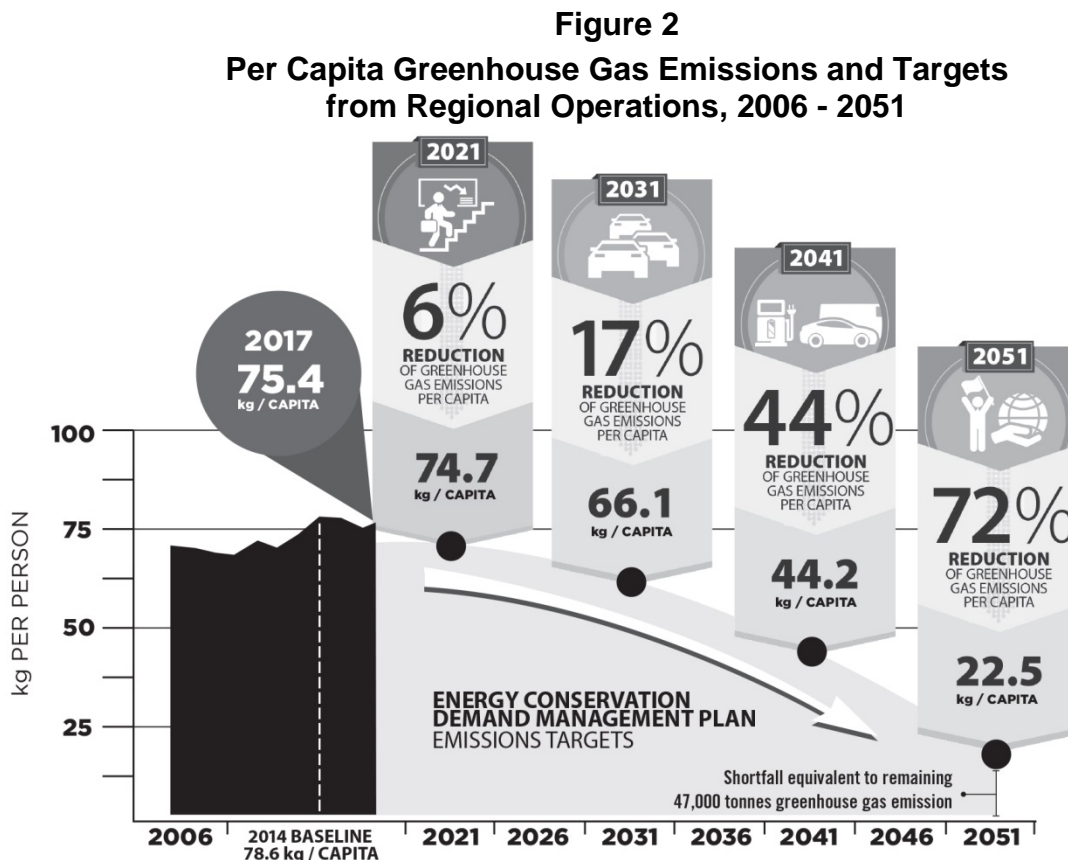
Vehicles, the Region’s largest source of Regional emissions, were also the greatest source of emissions reductions in 2017

Corporate vehicles such as transit buses, ambulances, police vehicles, and maintenance vehicles account for 63 per cent of the Region’s 2017 greenhouse gas emissions, as illustrated in Figure 1. Fuel efficiency initiatives implemented in 2017 reduced greenhouse gas emissions by 1,870 tonnes; equivalent to the annual emissions from 374 passenger vehicles.

Achieving zero carbon emissions will require the Region to electrify its vehicle fleet, including transit buses; initiatives that remain largely unfunded. Staff members remain optimistic as the cost of proven technologies such as solar panels and electric vehicles have fallen year over year, and adoption rates have increased, to a level where, when combined with external funding opportunities, business cases are at par with or better than those for conventional technologies. Transit’s current participation in the electric bus pilot program will help inform future business decisions on transit fleet electrification.

The Region is within one per cent of its 2021 Council endorsed per capita emissions target

Municipalities are challenged to reduce total greenhouse gas emissions when demand for service increases to meet the needs of a growing community. Per capita measurements are an effective way to measure performance separate from the influence of population growth. Recognizing that climate change is impacted solely by absolute greenhouse gas emissions, the Plan has set both absolute and per capita emissions targets for 2021, 2031, 2041, and 2051. Figure 2 illustrates the Region's per capita trend in emissions from 2006 to 2017 and its targets.



The Region's 2017 intensity of 75.4 kilograms of greenhouse gas emissions per resident is within one per cent of the Council endorsed 2021 target.

Per capita emissions in 2016 and 2017 were 77.8 and 75.4 kilograms per resident respectively. Year over year per capital emissions have fallen by a compound rate of 1.4 per cent since the 2014 baseline year. Per capita emissions within individual years have varied due to one-time initiatives such as a rationalization of transit bus routes or changes in population. Overall, the trend for the Region is moving towards the 2021 interim target of 74.7 kilograms per

resident. Attachment 1 illustrates per capita greenhouse gas emissions from Regional services and programs.

Across the corporation, examples of efforts in 2017 to reduce greenhouse gas emissions are summarized in Table 1.

Table 1
2017 Greenhouse Gas Reductions Accomplishments

Initiatives	Capital Cost	Annual Emissions Reduction	\$/tonne*
Transit Fleet Upgrades Installed technologies that improved transit bus fuel efficiency by 4 per cent	\$400,000	1,100 tonnes	\$363
Ambulance Anti-Idling Technologies Installed on 46 ambulances and conserved 29,046 litres of gasoline	\$284,000	73.6 tonnes	\$3,860
Solar Photovoltaic Generation Generated 242 megawatt hours of emission free electricity, enough to power 25 homes for one year	\$1.5 million	10.4 tonnes	\$144,230**
Sustainable Building Certifications Built York Regional Police training facility (70 Bales) to achieve LEED® Silver certification	Dedicated costs and benefits analysis are unavailable		n/a
Ongoing Auditing and Commissioning Audited 15 Regional facilities. Calibrated sensors, performed functional testing, replaced faulty equipment and sensors to ensure optimal performance, comfort, and energy savings	\$76,000	Cannot isolate from other initiatives that occurred concurrently with commissioning	n/a

* Emission Normalized Investment Intensity

** Note: Revenues from solar generation support a ten year payback on capital investment.

Corporate efforts to reduce greenhouse gas emissions range from simple to complex activities and investments as shown by the wide range of emission normalized investment intensities illustrated in Table 1. These accomplishments along with other reductions efforts build corporate experience and knowledge,

charting the course for achieving our aspirational 2051 goal of zero greenhouse gas emissions.

Staff are building on this current momentum with the following energy conservation initiatives.

A policy is under development to enhance energy performance for corporate buildings

Building energy consumption accounts for a quarter of the Region's total corporate greenhouse gas emissions. Given the lifespan of a typical building, and accounting for operations, the greatest financial and sustainability opportunities need to be considered at the time of design and construction. Staff had committed in the 2016 Corporate Energy Report to deliver a revision of the technical standards for new construction and renovations of Regional buildings to Council by 2018. As work was underway for this effort, the Province released the new Ontario Building Code requirements for energy efficiency that came into effect on January 1, 2018. It was recognized that these new requirements, the Council directive for LEED® silver certification, and a target of zero emissions by 2051, help to drive building energy conservation. A report back to Council on the Sustainable Building Policy will be included in the 2019 update of the Energy Conservation and Demand Management Plan.

Staff are evaluating the potential to integrate electric and hybrid-electric vehicles into the corporate fleets

Non-transit fleet fuel consumption accounts for 15 per cent of the Region's total annual greenhouse gas emissions in 2017. Electric and hybrid-electric vehicles are more fuel efficient, less costly to operate, and emit fewer greenhouse gases in comparison to traditional alternatives. Transitioning to electric and hybrid-electric vehicles is at its very beginning of the process with considerable work that is needed to understand the implications and complexity of moving to a new greener fleet design.

Transportation and Environmental Services are working on an implementation plan to increase low-emission vehicle use at the Region. Plan targets for vehicle emissions can be achieved with a willingness from all users of Regional equipment to adapt alternative fuels or hybrid electric vehicles. As this industry continues to make technology advancements, staff will continue to assess the use of new vehicle options that are cost effective, meet service requirements, and help reduce greenhouse gas emissions.

The Energy Conservation and Demand Management Plan will be updated by July 2019 as required by legislation

All municipalities across the Province will be updating their Plans to meet legislative deadline of July 2019. The Region is taking this opportunity to update the current Plan to include changes in operations, technologies and available funding opportunities. Using a collaborative process, sector specific stakeholder meetings with all Regional departments will be held throughout Q3 and Q4 of 2018. A final report will be brought forward to Council in 2019.

York Regional Transit begins electric bus pilot in Newmarket

Funding for the Pan-Ontario Electric Bus Demonstration and Integration Trial has been finalized to initiate a strategic shift to zero emission propulsion technology as reported to Council in May 2018. York Region is one of two municipalities in Ontario, including Brampton Transit, participating in a zero-emissions pilot on three of its current Newmarket routes using six electric buses. This pilot is anticipated to commence in 2019. Transit fuel is the Region's single largest source of energy and emissions. Switching to cleaner fuels such as electricity is necessary for the Region to meet its Plan targets and Vision 2051 net zero emission goals.

York Region will plant its 1,500,000th tree in 2018, increasing its green canopy and potential to store carbon emissions

The Region's green infrastructure has an estimated replacement value of \$488 million and contributes to the 80,000 tonnes of carbon stored annually by all trees in York Region. York Region owned forests contribute to approximately 6,700 tons or 7 per cent of the total absorption. Through the Regional Greening Strategy and the continued efforts of residents and conservation partners, over 1.5 million trees will have been planted by 2018 which grows this critical asset for our community.

The Region received approvals to increase its solar generation capacity

Solar power generation demonstrates the Region's commitment to greater use of renewable energy sources and provides an innovation platform to evaluate and explore these technologies in a corporate operational context. In 2017, the Region received approvals from the Independent Electricity System Operator (IESO) to build 16 additional projects that will increase the Region's generation capacity from 215 kW to 865 kW. To date, 15 of the 16 projects have been constructed and are in process of completing their connection to the electricity grid. All Regional solar projects generate revenue through fixed

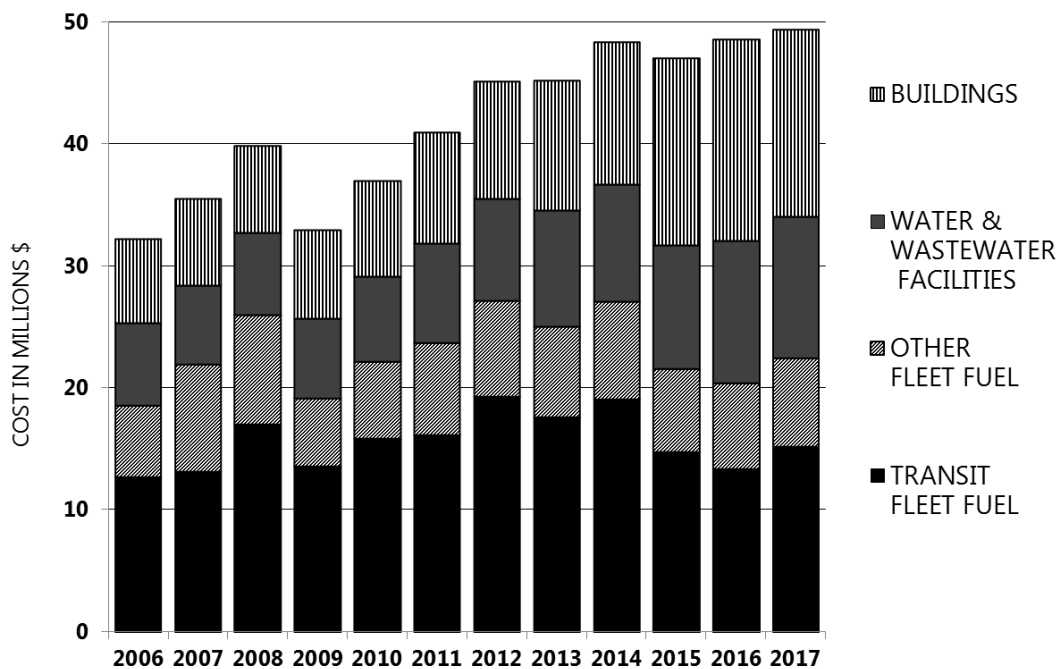
contracts with the provincial incentive programs. Capital costs for projects are justified based on a ten-year payback.

5. Financial Considerations

Regional operations incurred energy costs totalling \$49.4 million in 2017

Total 2017 energy costs for Regional operations increased by \$850,000 compared to 2016 and totaled \$49.4 million. The increase was primarily attributed to an 11 per cent increase in the price of vehicle fuels in spite of a three per cent decrease in fuel consumption. Figure 4 shows the trend and cost break down by Regional operations.

Figure 3
Energy Cost Trend by Operation, 2006 - 2017



Crude oil prices rose by 17 per cent in 2017 but remain below the historic ten-year average

The Region's largest single energy source and cost are associated with vehicle fuels. Crude oil prices were low in 2015 and 2016 due to over-supply. Oil prices rose by 17 per cent in 2017 to an average of \$50.83 per barrel, which is still below the historic ten-year average of approximately \$75 per barrel. Cap and

Trade, which took effect in 2017, also had an inflationary impact on the cost of vehicle fuels but this was somewhat muted by the lower commodity price.

The Region's cost of electricity in 2017 fell for the first time since 2007 saving the Region \$1.46 million compared to 2016

Electricity prices have grown by an annual compound rate of seven per cent since 2007. Consumption has also increased over the same period in response to a growing demand for Regional services. Since 2007, the Region's cost of electricity has doubled from \$11.1 million to \$22.5 million in 2017.

The Region's cost of electricity fell by \$1.46 million in 2017, its first reduction since 2007. Consumption remained constant in 2017 while the price dropped by six per cent. In 2017, the government created the Ontario Fair Hydro Plan, which committed to cut the average electricity customer's cost by 25 per cent. It also created a favourable rate structure for four of the Region's largest electricity accounts; three water and wastewater pumping stations and a Transit bus garage.

Energy conservation reduces the Region's financial exposure to increases in energy prices

Financial impacts associated with higher utility prices can be mitigated through energy saving opportunities identified in the Plan but these initiatives are partially funded in the 10-year capital budget with a shortfall of \$28.6 million. Fuel efficient vehicles and energy efficient buildings currently have a capital cost premium but this is partially offset by operational savings. As the cost of energy (electricity, gasoline, diesel fuel, natural gas) increases, the additional avoided costs will further enhance the financial return and business case viability for conservation investments.

Region continues to leverage external funding opportunities where possible

Throughout 2017, the federal and provincial governments released funding opportunities to reduce greenhouse gas emissions. These funding opportunities are summarized and reported to Council on an annual basis, with the last report in [September 2017](#).

In [October 2017](#), Council endorsed the Region's proposal to apply to a new funding opportunity for municipal projects that reduce greenhouse gas emissions called the Municipal GHG Challenge Fund (Fund). The Region submitted an application in November 2017 for \$25.8 million in funding to reduce corporate emissions by 120,000 tonnes over the next 30 years. The Region was notified in February 2018 that its application was unsuccessful. Although Provincial staff were unable to provide specific feedback and rationale to each applicant,

information provided during a recent webinar held in early May outlined a combination of factors that lead to a successful application. Complete elimination of carbon emissions was identified as a critical factor. Prior information from Provincial staff also indicated that, while having a Community Energy Plan was not mandatory, it was preferred. Preparation of this Region wide Community Energy Plan is underway with all local municipalities as part of the Municipal Comprehensive Review process. As the York Region projects focused on reducing greenhouse gas emissions based on proven technologies, it appears that our submission received a lower priority. Staff continue to reach out to key Provincial staff to conduct face to face discussions and seek clarity to obtain lessons learned for future applications.

A second round of funding has now become available through the Municipal GHG Challenge Fund. The criteria for funding appear to be more flexible and the Province provided greater clarity on expectations in this second phase of funding. Table 2 lists the two projects that Regional staff have selected for submission:

Table 2
York Region Municipal GHG Challenge Fund Round 2 Projects

Project	Funding Request
<p>Ambulance hybrid technologies Integrate hybrid technologies into the Region’s ambulance and emergency response fleet</p>	\$1.6 million
<p>Electric vehicles and charging stations Integrate 25 electric vehicles for corporate fleet use and install 50 fee for service chargers at Regional properties</p>	\$1.7 million

Applications are due to the Fund by July 13, 2018 and do not require Council endorsement. Responses from the program are scheduled for December 2018. Staff have incorporated information from the previous round of successful bids such as the emphasis on carbon elimination to enhance the Regional submission to this round of funding.

6. Local Municipal Impact

Region is collaborating 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.

A Regional electric vehicle charging policy will support electric and hybrid-electric vehicle substitution

Stakeholders have been invited to attend a workshop in the summer to discuss a coordinated electric vehicle charging policy across the entire Region and within its local municipalities. Public access to vehicle charging stations will greatly influence the Region's ability to integrate electric vehicles in its fleets and support private citizens that also wish to switch to electric vehicles for personal use. A coordinated project proposal will provide a compelling application to any future funding programs directed at reducing greenhouse gas emissions.

Region-wide Community Energy Plan work is underway

As reported to Council in [November 2017](#), staff initiated development of a Regional Climate Change Action Plan that includes the development of a Community Energy Plan. The Regional Community Energy Plan will support the Municipal Comprehensive Review and set greenhouse gas emissions and energy use reduction targets to support implementation of the Growth Plan. These targets will be aligned with those in Ontario's Climate Change Action Plan and the York Region Energy and Conservation Demand Management Plan.

7. Conclusion

In 2017, Regional energy costs totalled \$49.4 million and produced 90,999 tonnes or 75.4 kilograms of greenhouse gas emissions for each York Region resident. Through the efforts by all departments, the corporation is quickly converging on its 2021 forecast in Energy Conservation and Demand Management. In order to support reporting obligations under the *Green Energy Act*, Council authority is required to enter into a software agreement for support services to maintain the existing data management systems. Continuous improvements are required in order to achieve the Region's Vision 2051 aspirational goal of zero carbon emissions by 2051. Work is underway to update the Energy Conservation and Demand Management Plan in order to meet regulatory obligations by July 2019 and will be reported to Council in Q2 2019.

2017 Corporate Energy Report

For more information on this report, please contact Wendy Kemp, Director, Strategy and Innovation, at 1-877-464-9675 ext. 75141.

The Senior Management Group has reviewed this report.

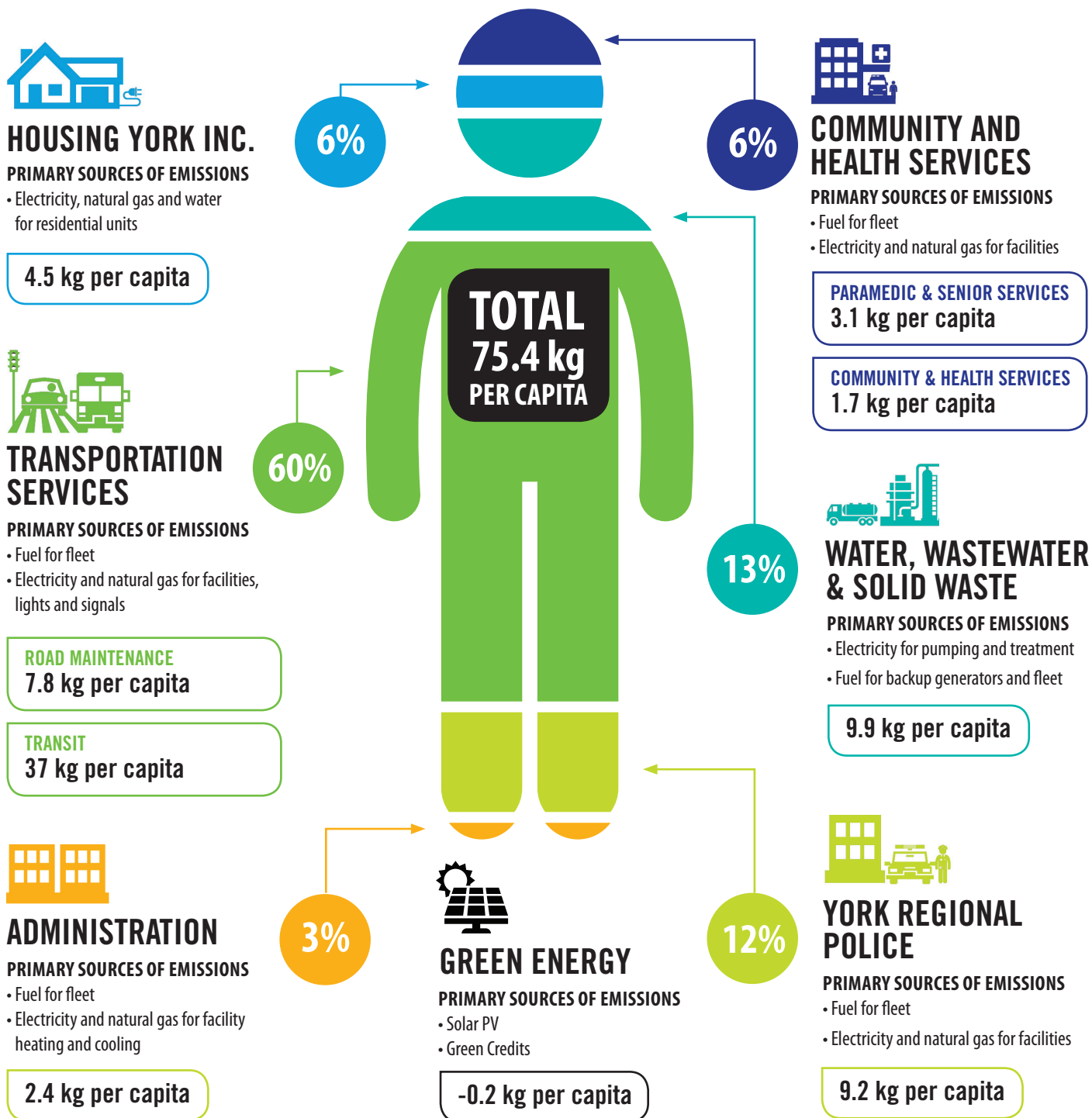
May 25, 2018

Attachments (1)

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Accessible formats or communication supports are available upon request

2017 Per Capita Greenhouse Gas Emissions from Regional Services



HOW MUCH GREENHOUSE GAS IS PRODUCED TO PROVIDE REGIONAL SERVICES FOR ONE YEAR PER RESIDENT?

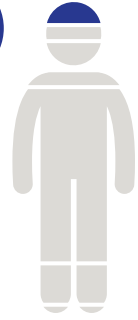
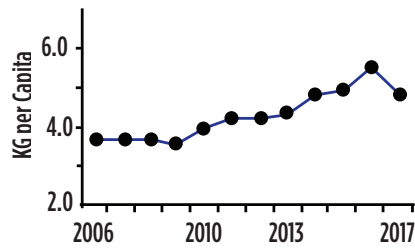
2017 TOTAL EMISSIONS: 90,999 TONNES | 2017 POPULATION: 1,206,543

2017 PER CAPITA GREENHOUSE GAS EMISSIONS FROM REGIONAL SERVICES



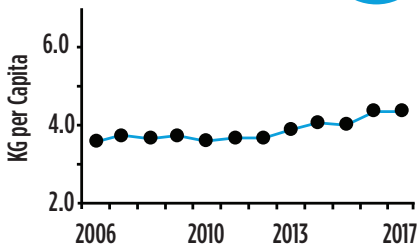
COMMUNITY AND HEALTH SERVICES

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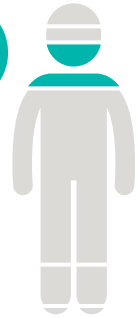
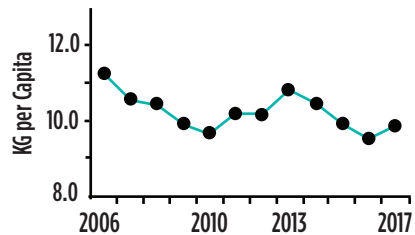
HOUSING YORK INC.

6%



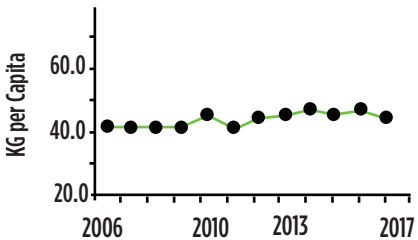
WATER, WASTEWATER & SOLID WASTE

13%



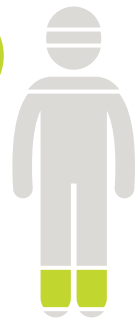
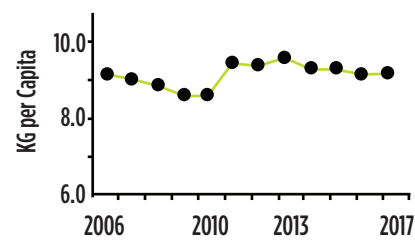
TRANSPORTATION SERVICES

60%



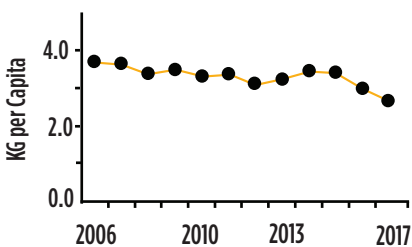
YORK REGIONAL POLICE

12%



ADMINISTRATION

3%



GREEN ENERGY

0%

