

To: Development Services Committee

From: Warren Munro, HBA, RPP, Commissioner,
Development Services Department

Report Number: DS-20-08

Date of Report: January 8, 2020

Date of Meeting: January 13, 2020

Subject: Federation of Canadian Municipalities' Partners for Climate
Protection Program - Draft Community Greenhouse Gas
Reduction Plan (Milestone 3)

File: B-8000-0094

1.0 Purpose

The purpose of this report is to:

- (a) Seek Council approval, in principle, of the Draft Community Greenhouse Gas Reduction Plan dated January 2020 (the “Draft Plan”) for Milestone 3 of the Partners for Climate Protection (P.C.P.) Program for the purposes of holding a public meeting and obtaining community input;
- (b) Authorize staff to schedule a public meeting of the Development Services Committee on the Draft Plan, with advertisements in the local newspapers and communicated through the City’s social media accounts and websites; and,
- (c) Authorize staff to seek public and stakeholder input on the Draft Plan including online and paper surveys.

Attachment 1 is a copy of Report DS-16-25 dated February 3, 2016 including the Federation of Canadian Municipalities’ Partners for Climate Protection Milestone 3 Submission – Corporate Plan (the “Corporate Plan”).

Attachment 2 is a copy of Report DS-17-197 dated November 30, 2017 concerning the proposed Terms of Reference for the City’s Community Greenhouse Gas Reduction Plan under the Federation of Canadian Municipalities’ Partners for Climate Protection Program.

Attachment 3 is a copy of the Draft Plan.

2.0 Recommendation

That the Development Services Committee recommend to City Council:

1. That, pursuant to Report DS-20-08 dated January 8, 2020, City Council approve, in principle, the Draft Community Greenhouse Gas Reduction Plan dated January 2020 for Milestone 3 of the Partners for Climate Protection Program for the purposes of holding a public meeting and obtaining community input.
2. That, pursuant to Report DS-20-08 dated January 8, 2020, staff be authorized to hold a public meeting of the Development Services Committee on the Draft Community Greenhouse Gas Reduction Plan, with advertisements in the local newspapers and communicated through the City's social media accounts and websites.
3. That City Council endorse an interim greenhouse gas emission reduction target of 30% below the 2007 baseline levels by 2030.
4. That staff be authorized to seek public and stakeholder input on the Draft Community Greenhouse Gas Reduction Plan including online and paper surveys.

3.0 Executive Summary

The City of Oshawa is a member of the Federation of Canadian Municipalities' Partners for Climate Protection Program. This Program is a voluntary, five-milestone framework to help municipalities reduce energy costs, energy consumption and greenhouse gas emissions.

Members of the Partners for Climate Protection Program committed to developing corporate (city operations) and community (citywide) action plans to reduce greenhouse gas emissions. The City has achieved all five milestones for creating and implementing the Corporate Plan, and has achieved Milestone 1 (establishing a baseline inventory year for corporate and community emissions) and Milestone 2 (setting emissions targets) of the community plan.

The Draft Community Greenhouse Gas Reduction Plan was developed through a collaborative process and identifies various actions and opportunities that will reduce greenhouse gas emissions in Oshawa, while achieving additional environmental, economic and social benefits.

4.0 Input From Other Sources

The following have been consulted in the preparation of this report:

- Commissioner, Community Services
- Commissioner, Corporate Services
- Oshawa Environmental Advisory Committee (O.E.A.C.)
- Oshawa Active Transportation Advisory Committee (O.A.T.A.C.)
- Oshawa Power and Utilities Corporation (O.P.U.C.)
- International Council for Local Environmental Initiatives (I.C.L.E.I.)

- The public and stakeholders
- Other Municipalities

5.0 Analysis

5.1 Legislative Framework

5.1.1 Federal Greenhouse Gas Reduction Targets – the Paris Agreement

On December 12, 2015, the Government of Canada, along with 194 other countries, signed the Paris Agreement, which aims to strengthen the global response to the threat of climate change by:

- Holding the increase in the global average temperature to well below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 degrees Celsius above pre-industrial levels;
- Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas (G.H.G.) emissions development in a manner that does not threaten food production; and,
- Making finance flows (i.e. investment, trade, spending, etc.) consistent with a pathway towards low G.H.G. emissions and climate resilient development.

Additional information on the Paris Agreement can be found at the following link:
<https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>.

Under the Paris Agreement, Canada committed to reducing its G.H.G. emissions by 30% below 2005 levels by 2030. To reach this target, the projected emission reductions will come from the following strategies:

- New policies implemented since 2015 (i.e. accelerated phase-out of coal-fired electricity);
- The implementation of policies in the Pan-Canadian Framework on Clean Growth and Climate Change (i.e. clean fuel standards, net zero building codes, etc.);
- Land sector contribution (i.e. types of land use, changes in land use and forestry activities that impact G.H.G. emissions, such as urban settlements, commercial/industrial uses and agriculture); and,
- Additional policies and measures that are under development but have not yet been fully implemented, as well as emerging and future reductions (i.e., new technologies, future government-lead measures, etc.).

Additional information on Canada's progress towards its G.H.G. emissions reduction target can be found at the following link: <https://www.canada.ca/en/environment-climate->

[change/services/environmental-indicators/progress-towards-canada-greenhouse-gas-emissions-reduction-target.html](https://www.durham.ca/city-services/environmental-indicators/progress-towards-canada-greenhouse-gas-emissions-reduction-target.html).

Staff note that the City should adopt an interim G.H.G. emission reduction target of 30% below its 2007 baseline level by 2030 to generally align with the federal government's target.

5.1.2 Provincial Greenhouse Gas Reduction Targets – the Made-in-Ontario Environment Plan

On November 29, 2018, the Province released the Made-in-Ontario Environment Plan ("Ontario's Environment Plan"), which aims to:

- Help protect our air, land and water;
- Address litter and reduce waste;
- Support Ontarians to continue doing their share to reduce G.H.G. emissions; and,
- Help communities and families prepare for climate change.

Through Ontario's Environment Plan, the Province committed to reducing its G.H.G. emissions by 30% below 2005 levels by 2030, which aligns with Canada's target under the Paris Agreement.

Additional Information on Ontario's Environment Plan can be found at the following link: <https://www.ontario.ca/page/made-in-ontario-environment-plan>.

Again, staff note that the City should adopt an interim G.H.G. emission reduction target of 30% below its 2007 baseline level by 2030 to generally align with the provincial government's target.

5.1.2.1 Provincial Air Quality Monitoring

The Province, through the Ministry of Environment, Conservation and Parks, operates a network of 39 Air Quality Index (A.Q.I.) monitoring stations across Ontario, including one station in Durham Region, located at Durham College in Oshawa.

A.Q.I. monitoring stations generally measure the following six common pollutants, which can have adverse effects on human health and contribute to global warming at high levels:

- Ground level Ozone;
- Fine particulate matter;
- Nitrogen dioxide;
- Carbon monoxide;
- Sulphur dioxide; and,
- Total reduced sulphur compounds.

In 2014, City staff was directed to provide Council with relevant information on the results and trends analysis by the Province from the A.Q.I. station located at Durham College, as it becomes available.

On November 26, 2019, City Council received Information Report INFO-19-330 containing a summary of the Province's 2017 Air Quality Report.

5.1.3 Region of Durham Greenhouse Gas Reduction Targets

On June 2, 2010, Regional Council adopted the following G.H.G. emission reduction targets:

- 5% reduction from 2007 levels by 2015;
- 20% reduction from 2007 levels by 2020; and,
- 80% reduction from 2007 levels by 2050.

These targets are consistent with the G.H.G. emission reduction levels that the Intergovernmental Panel on Climate Change deems necessary to limit global warming to 2 degrees Celsius.

On April 24, 2019, Regional Council approved the Durham Community Energy Plan (D.C.E.P.), in principle. The D.C.E.P. is a long-term plan to achieve the above-mentioned targets by improving energy efficiency and reducing energy consumption in the Region.

Additional information on the D.C.E.P. can be found at the following link:
<https://www.durham.ca/en/living-here/durham-community-energy-plan.aspx>

5.1.4 City of Oshawa Policies

5.1.4.1 2015-2019 Oshawa Strategic Plan

The Oshawa Strategic Plan (O.S.P.) was endorsed by City Council in 2015 and serves as the City's highest-level policy document. The O.S.P. includes a Strategic Goal of Environmental Responsibility, and seeks to protect, conserve and promote the environment.

On November 5, 2019, City Council considered Report CNCL-19-65 dated October 30, 2019 concerning the recommended approach for the 2020-2023 Oshawa Strategic Plan (O.S.P.), and approved, in principle, for the purposes of obtaining public input on the O.S.P., the following motions:

“That the words ‘targets, and benchmarking aligned with federally and internationally recognized targets’ be added after the word ‘plans’ in Strategy 3 of the Theme of Proactive Environmental Management; and,

That the words ‘and combat climate change’ be added to the title of the Theme of ‘Proactive Environmental Management’.”

Accordingly, Theme 1 under the “Environmental Responsibility” goal of the 2020-2023 O.S.P. will, subject to public input and formal adoption by Council, be “Proactive Environmental Management and Combat Climate Change”. Furthermore, Strategy 3 under this Theme will be to “develop and implement corporate and community plans, targets, and benchmarking aligned with federally and internationally recognized targets to reduce greenhouse gas emissions and energy use.”

In response to the proposed update to the O.S.P. to include combatting climate change, on December 16, 2019, City Council adopted the recommendation contained in Item FIN-19-107 as follows:

1. That the City of Oshawa declare climate change as an emergency for the purpose of protecting wildlife, our natural environment and our economy; and,
2. That the City of Oshawa apply a climate lens to plans and actions of the City of Oshawa including strategic plans and future budgets; and,
3. That the City of Oshawa copy neighbouring Municipalities, Regional Council, Members of Provincial Parliament and Members of Parliament on official correspondence of this declaration in an effort to seek assistance in resources and funding to help our community effectively combat climate change.

5.1.4.2 Oshawa Official Plan

The Oshawa Official Plan (O.O.P.) sets out the land use policy directions for long-term growth and developments in the City. The O.O.P. includes policies related to environmental management, conservation and long-term sustainability. Policy 5.1.11 of the O.O.P. states, in part, that “The City supports incremental reduction of overall greenhouse gas emissions and other air pollutants generated by the municipality’s own corporate activities and functions.”

5.1.4.3 Integrated Transportation Master Plan and Active Transportation Master Plan

The City’s Integrated Transportation Master Plan (I.T.M.P.) is a planning document designed to define the policies, programs and infrastructure changes required to meet future transportation needs. The I.T.M.P. seeks to encourage sustainability and reduce G.H.G. emissions by providing residents with viable multi-modal transportation options that include alternatives to gas-powered automobiles.

The Active Transportation Master Plan (A.T.M.P.) is a statement of the City’s ongoing commitment to promote active lifestyle opportunities and choices for residents, visitors and employees in the City. The A.T.M.P. helps to reduce G.H.G. emissions by encouraging a multi-modal network that supports sustainable, healthy and complete communities.

5.2 Partners for Climate Protection Program

The P.C.P. Program is voluntary and was established by the Federation of Canadian Municipalities (F.C.M.) in 1994. It was created to help municipalities take action against climate change through the following five-milestone framework:

- Milestone 1: create a baseline emissions inventory and forecast;
- Milestone 2: set emissions reduction targets;
- Milestone 3: develop a local action plan;
- Milestone 4: implement the local action plan; and,
- Milestone 5: monitor progress and report results.

The P.C.P. Program also provides project funding through the Green Municipal Fund for the development of community and corporate plans.

5.2.1 Milestones 1 and 2

On March 9, 2009, City Council considered Report DS-09-74 dated February 25, 2009, and approved a recommendation to participate in the P.C.P. Program and committed to achieving the milestones set out in the P.C.P. five-milestone framework.

On September 7, 2010, City Council considered Report DS-10-217 dated August 25, 2010, and approved the following recommendation:

- “1. That Report DS-10-217 dated August 25, 2010 and its attached inventories be submitted to the Federation of Canadian Municipalities Partners for Climate Protection Program in partial satisfaction of Milestone 1 of the Program; and
2. That Milestone 1 of the Program be finally completed by adopting 2007 as the City’s benchmark or baseline year for the purposes of monitoring and measuring the City’s future performance in achieving its Greenhouse Gas reduction targets and that the Partners for Climate Protection Program be so advised; and
3. That the following community and corporate Greenhouse Gas emission targets be adopted as provisional targets until a local action plan is developed at which time the targets may be further refined:
 - 5% reduction by 2015 from 2007 baseline;
 - 20% reduction by 2020 from 2007 baseline;
 - 80% reduction by 2050 from 2007 baseline; and,
4. That the City apply to the Federation of Canadian Municipalities Green Municipal Fund for funding to complete Milestone 3 (preparation of a Local Action Plan/Integrated Community Sustainability Plan for reducing Greenhouse Gas Emissions) and that any additional City funding required be referred to the 2011 budget for consideration for funding from the Gas Tax.”

The G.H.G. emission reduction targets identified in the above Council resolution are consistent with the Region of Durham’s G.H.G. emission reduction targets identified in the D.C.E.P.

On January 28, 2013, City Council considered Report DS-13-10 dated January 9, 2013, concerning the Environmental Commissioner of Ontario’s Annual G.H.G. Progress Report 2012, and approved the following recommendation:

- “That Report DS-13-10 dated January 9, 2013, regarding the Environmental Commissioner of Ontario’s Annual Greenhouse Gas Progress Report 2012 – A Question of Commitment, be received for information and that staff proceed with Milestone 3 of the Federation of Canadian Municipalities Partners for Climate Protection plan, which requires the development and implementation of corporate and

community greenhouse gas emission reduction plans to achieve the Milestone 2 targets previously established and approved by Council.”

5.2.2 Corporate G.H.G. Reduction Plan

On February 22, 2016, City Council considered Report DS-16-25 dated February 3, 2016 concerning the P.C.P. Program Milestone 3 Corporate Plan Submission (see Attachment 1), and approved the following recommendation:

“That pursuant to Report DS-16-25 dated February 3, 2016, City Council endorse the City’s Partners for Climate Protection Milestone 3 Corporate Plan as a guideline to reduce energy costs, energy consumption and greenhouse gas emissions, and that staff be authorized to submit it to the Federation of Canadian Municipalities for review and approval.”

As a result of completing the Milestone 3 submission of the Corporate Plan, the City received acknowledgement from F.C.M. on March 8, 2016 that it had achieved Milestones 3, 4, and 5 for the Corporate Plan. It should be noted that this acknowledgement of achievement does not relate to the component of Milestone 3 requiring the establishment of a community action plan.

To date, the City has, and continues to, complete many of the actions identified in the Corporate Plan to help reduce the G.H.G. emissions from corporate sources.

In addition to the City’s voluntary efforts to reduce its carbon footprint, the City is mandated by O. Reg. 507/18 under the Energy Act, 1998, to prepare a Corporate Facilities Energy Management Plan (C.F.E.M.P.) and update it every five years.

On June 24, 2019, City Council considered Report CORP-19-62 concerning an update to the C.F.E.M.P., and approved the following recommendation:

“That the Corporate Facilities Energy Management Plan 2019 – 2023, dated June 12, 2019, as set out in Attachment 1 to Report CORP-19-62 be endorsed.”

A C.F.E.M.P. supports the goals and targets set out in the City’s Corporate Plan.

5.3 Community G.H.G. Plan (Milestone 3)

5.3.1 Background

Milestone 3 of the P.C.P. Program requires members to establish corporate and community action plans to reduce energy costs, energy consumption and G.H.G. emissions, including the following information:

- A description of the activities that will help achieve the reductions set out in Milestone 2;
- A description of the public or internal stakeholders who participated in developing the plans;

- A description of costs associated with the implementation of the plans and funding sources; and,
- The municipal departments and/or the organizations responsible for the actions outlined in the plans.

On December 18, 2017, City Council considered Report DS-17-197 dated November 30, 2017 concerning the proposed Terms of Reference for the City’s Community G.H.G. Reduction Plan under the P.C.P. Program (see Attachment 2), and approved the following recommendation:

“That pursuant to Report DS-17-197 dated November 30, 2017, City Council endorse the Terms of Reference, as outlined in Section 5.4 of said Report, for the preparation of the City’s Community Greenhouse Gas (G.H.G.) Reduction Plan under the Federation of Canadian Municipalities’ Partners for Climate Protection Program.”

The Council-approved Terms of Reference outlined the goal, objectives, scope and community and stakeholder engagement strategy for the Milestone 3 Community G.H.G. Reduction Plan.

5.3.2 Stakeholder Engagement

5.3.2.1 Advisory Committees

On February 5, 2019, staff provided a presentation concerning the objectives to be included in the City’s Community G.H.G. Reduction Plan to O.E.A.C.

On March 6, 2019, staff provided a presentation concerning the objectives to be included in the City’s Community G.H.G. Reduction Plan to O.A.T.A.C.

Both advisory committees were invited and encouraged to participate in the public consultation process in 2019, and they were also advised that City staff plan to consult with them on the Draft Plan once approved, in principle, by City Council.

5.3.2.2 Stakeholder Workshop

Staff organized a stakeholder workshop on June 25, 2018 to engage key stakeholders on the development of the Draft Plan. Table 1 provides a list of all community stakeholders who were invited to participate in the stakeholder workshop and identifies which stakeholders attended the workshop on June 25, 2018:

Table 1: Community Stakeholder Attendance at the June 25, 2018 Stakeholder Workshop

Stakeholder	Attendance at Workshop (Y/N)
A representative from the agricultural community	N
Building Industry Liaison Team	N
Canadian Urban Institute	Y

Stakeholder	Attendance at Workshop (Y/N)
Central Lake Ontario Conservation Authority	Y
City of Oshawa	Y
Conseil Scolaire de district Catholique Centre-sud	N
Conseil Scolaire Viamonde	N
Delpark Homes	N
Downtown Oshawa Business Improvement Association	N
Durham Catholic District School Board	Y
Durham College	Y
Durham District School Board	Y
Durham Integrated Growers	Y
Durham Region	Y
Durham Sustain Ability	N
Durham Youth Council	Y
ECO Business Network	N
Enbridge Gas	Y
Fieldgate Homes Limited	Y
FLO (Electric vehicle charging network provider)	Y
Friends of Second Marsh	N
General Motors of Canada	Y
Greater Oshawa Chamber of Commerce	N
Intellimeter Canada Inc.	Y
Ivanhoe Cambridge (Oshawa Centre)	Y
Lakeridge Health (Oshawa)	N
Medallion Corporation	N
Metrolinx	Y
Midhaven Homes	N
Ministry of Environment, Conservation and Parks	Y
Minto Group	N
Ontario Power Generation	N
Ontario Tech University (formerly, University of Ontario Institute of Technology)	Y
Oshawa Cycling Club	N
Oshawa/Durham Youth Council	N
Oshawa Power and Utility Corporation	Y

Stakeholder	Attendance at Workshop (Y/N)
Plug'n Drive	N
Podium Developments	N
Representatives from transportation companies	N
RioCan Real Estate Investment Trust	N
Solar Panel companies	N
Sorbara Group of Companies	N
Stafford Homes	N
Tesla	N
Trent University (Durham Greater Toronto Area)	Y
Tribute Communities	Y
Unifor Local 222	N
Upperview Homes	N
We Grow Food	Y

The following is a summary of the feedback obtained by staff from the stakeholder workshop:

- Participants were asked to consider the following areas of focus throughout the workshop: at home, at work, at school and on the move;
- Participants identified existing technology/opportunities that could be considered and/or built upon in the development of the Draft Plan. The most common opportunities identified at the workshop to help reduce G.H.G. emissions were:
 - The development of Net Zero homes by the development industry;
 - Promoting the use of solar power and solar thermal heating;
 - Promoting the use of electric vehicle chargers;
 - The development of low carbon buildings and City facilities;
 - Promoting environmental building certifications;
 - Implementing land use planning policies;
 - Promoting tree planting initiatives to assist in carbon capture; and,
 - The provision of incentives by the Province (note: the Province’s GreenON Program was cancelled by the newly elected Provincial government shortly after the stakeholder workshop was held).
- Participants identified new programs/opportunities that could be considered and/or built upon in the development of the Draft Plan. The most common opportunities identified at the workshop to help reduce G.H.G. emissions were:
 - Providing incentives for Net Zero homes;
 - Planning for multi-modal communities;
 - Developing Net Zero home standards/City green building standards;
 - Providing retrofit incentives for multi-residential buildings;

- Developing alternative fuel sources (i.e. bio-gas, renewable natural gas, etc.);
- Promoting green roofs for new builds;
- Supporting district energy systems;
- Promoting anti-idling programs;
- Promoting electric vehicle use and providing incentives;
- Developing cycling/walking infrastructure;
- Supporting a bike share program; and,
- Promoting public knowledge of the importance of reducing G.H.G. emissions.

The input received during the stakeholder workshop was considered in the development of the Draft Plan, contained in Attachment 3.

5.3.3 Public Consultation Process

Staff undertook a one-month public consultation process beginning on March 6, 2019 and concluding on April 5, 2019 to engage community members on the potential objectives, actions and opportunities to be included in the Draft Plan.

The consultation process was comprised of various engagement initiatives that included the use of Connect Oshawa (www.connectoshawa.ca), the City's online engagement platform. Engagement opportunities included:

- A survey available online on Connect Oshawa (and on paper at Service Oshawa and at the Public Workshop and Community Engagement Table);
- A Community Engagement Table held on Wednesday, March 21 between 4:30 p.m. and 6:00 p.m. at Oshawa City Hall; and,
- A Public Workshop held on Thursday, March 21 between 6:00 p.m. and 8:30 p.m. at Oshawa City Hall.

The opportunity to provide input through public consultation was advertised to the community and stakeholders by various methods, including media materials, social media, the City's websites, as well as print and digital promotional material.

5.3.3.1 Public Response

Below is a breakdown of the responses received by staff throughout the public engagement process. In total:

- 5 people completed the survey; and,
- 16 people attended either the community engagement table or public workshop.

Standardized questions were used in the online and paper surveys to ensure consistency. The Connect Oshawa online survey required site registration or a temporary screen name and email address for each submission. The system only allowed one (1) response per person using a particular email address.

5.3.3.2 Findings

The following is a summary of the key findings from the Community Engagement Table, the Public Workshop and the survey:

- A cost benefit analysis should be built into the plan to ensure that any costs are accounted for and not passed on to consumers or tax payers;
- Solar cells and energy storage devices should be installed on most municipal buildings with chargers for electric vehicles and bicycles;
- The City should mandate that all commercial and residential new builds be built with only electric heating, outlets and electric stoves, fridges, ranges. Everything must be powered by electricity only. A built-in electric socket to charge electric-powered cars should be a mandatory installation;
- The City should require apartments, office buildings and commercial areas to provide bicycle storage, and provide for electric vehicles and bicycle charging;
- Establish a right-to-sunlight by-law;
- Invest Oshawa should focus on attracting the renewable energy industry to Oshawa;
- The City should use marketing, communication and awareness campaigns to change people's minds before implementing legislation; and,
- Council should take a leadership role on climate change and consider all City matters through a climate lens.

The input received during the public consultation process was considered in the development of the Draft Plan dated January 2020 (see Attachment 3).

5.3.4 Draft Plan Summary

5.3.4.1 Objectives

The Draft Plan builds on existing policies and plans such as the Oshawa Strategic Plan, Official Plan, Active Transportation Master Plan and Integrated Transportation Master Plan. Staff also reviewed community action plans and G.H.G. reduction plans of various municipalities across Canada to help inform the development of the Draft Plan.

The key objectives of the Draft Plan are to:

- Increase renewable energy use;
- Implement policy that promotes energy efficiency in buildings and transportation; and,
- Promote sustainability through leadership and education.

5.3.4.2 Actions and Opportunities

The Draft Plan identifies actions under the themes of at home, at work, at school and on the move. These actions will help to reduce G.H.G. emissions and provide additional environmental, economic and social benefits to the City of Oshawa. The proposed actions are as follows:

Actions at Home

1. Increase renewable electricity generation from renewable sources in residential buildings;
2. Improve energy performance in residential buildings;

Actions at Work and School

3. Increase renewable electricity generation from renewable sources in commercial buildings;
4. Improve energy performance in commercial buildings;

Actions on the Move

5. Promote low carbon or no carbon vehicles;
6. Increase/improve cycling and walking infrastructure to encourage active forms of transportation; and,
7. Coordinate land use policies to establish a built form that promotes sustainable growth.

The Draft Plan also identifies three additional opportunities that may help to reduce G.H.G. emissions and result in a positive impact on the environment; including:

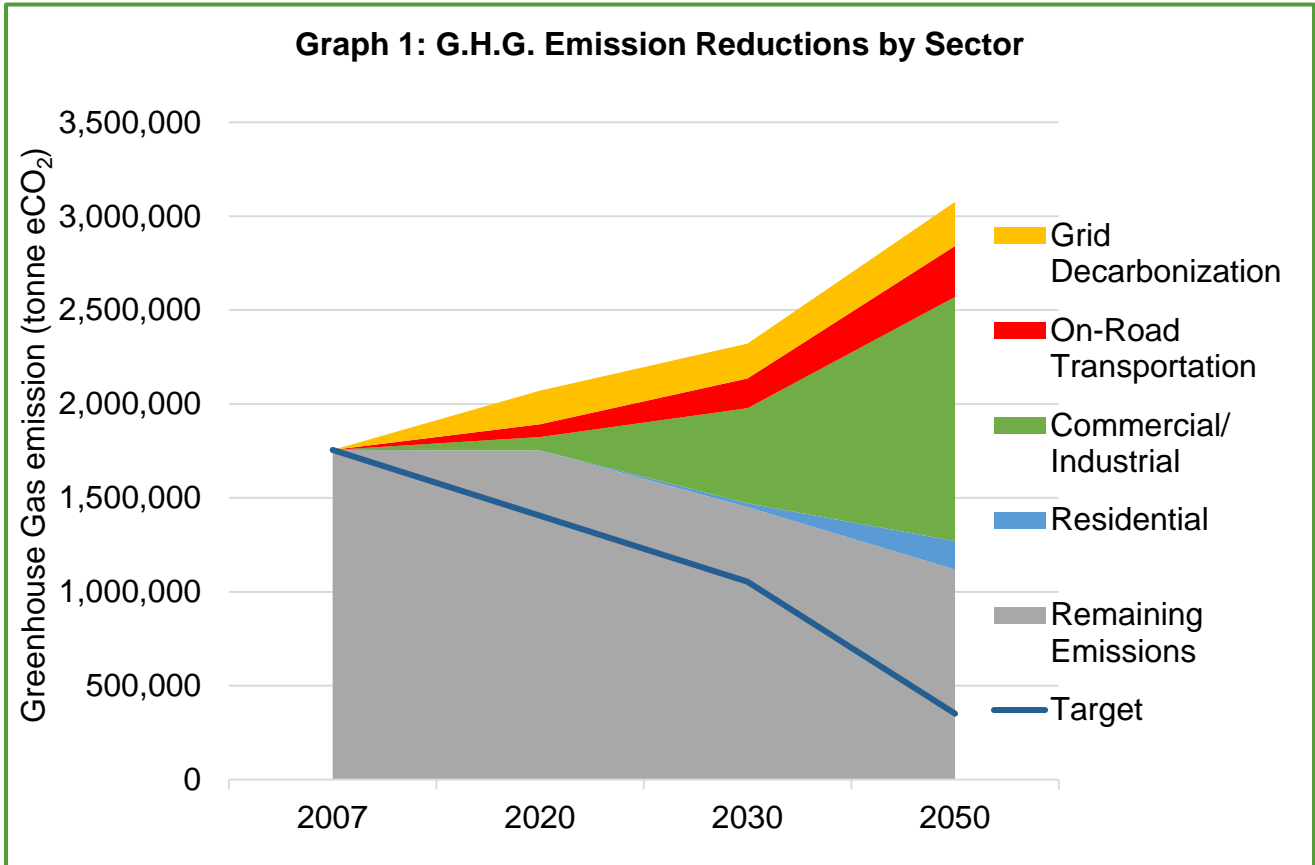
1. Promote energy efficient business operations;
2. Promote sustainable practices through strategic outreach and education; and,
3. Strengthen the City's capacity to be a leader in sustainability and implement the actions in the Draft Plan.

A detailed breakdown of the actions and opportunities and their associated G.H.G. emission reductions, additional benefits and potential partners can be found in the Draft Plan in Attachment 3.

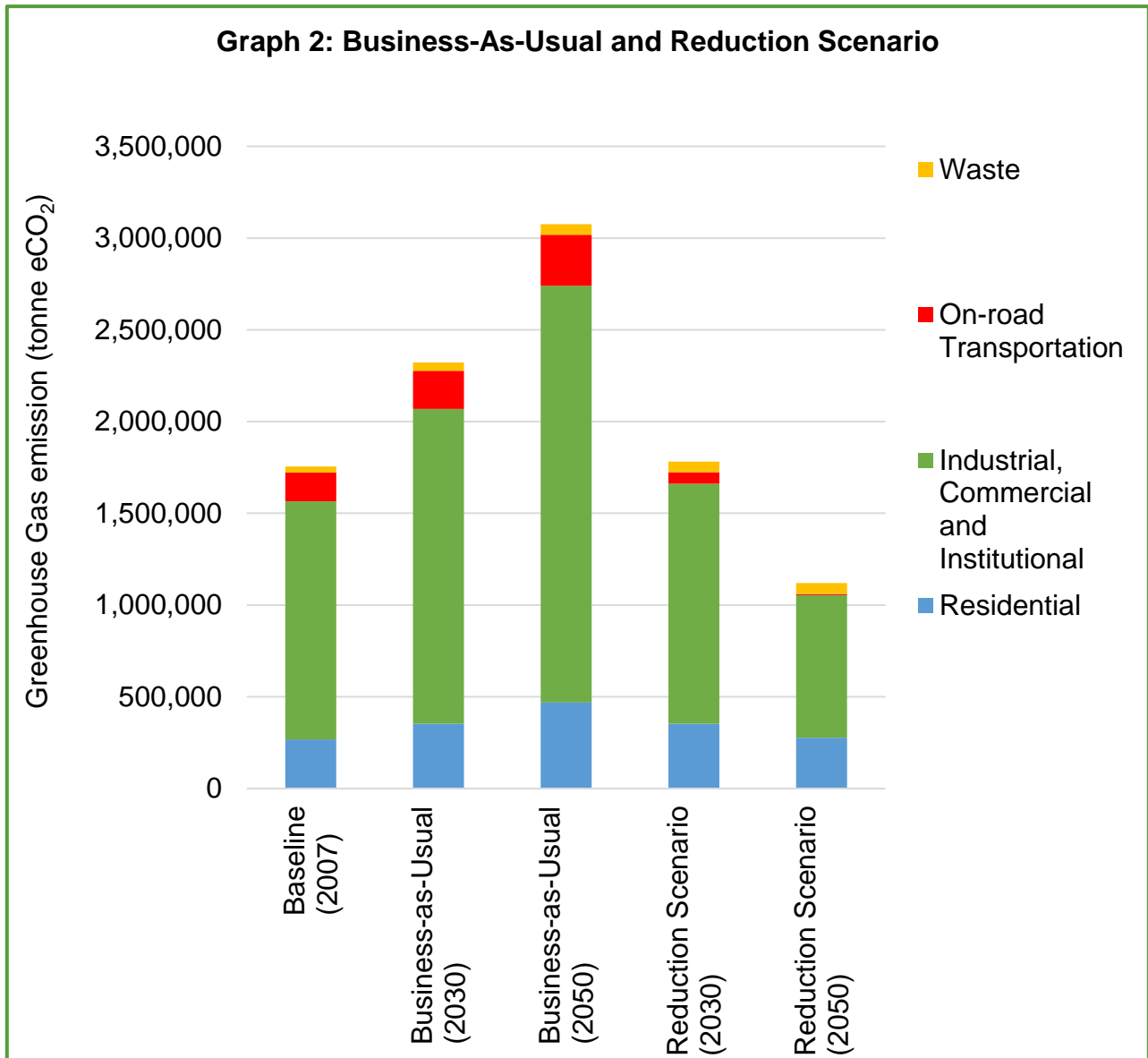
5.3.4.3 Estimated Outcomes

In consultation with I.C.L.E.I., staff used the online Milestone 3 Scenario Builder tool provided by F.C.M. and I.C.L.E.I. to estimate the potential G.H.G. emission reductions from the various actions identified in the Draft Plan. The Scenario Builder shows the potential of different mitigation actions to reduce G.H.G. emissions and allows users to select policy options, prioritize measures for implementation, and report on anticipated future impacts.

The various actions identified in the Draft Plan may help reduce G.H.G. emissions from the following sectors: residential, commercial, institutional and transportation. The following graph shows the emissions reduction by sector and the remaining emissions to achieve the City's identified targets of 20% by 2020 and 80% by 2050, as well as an unofficial target of 30% by 2030 (see Graph 1).



The data analysis showed that if Oshawa were to continue under a “Business-as-usual” scenario (i.e. assumes that there will be no significant change in behaviour, priorities or policies), G.H.G. emissions in Oshawa are estimated to increase 75% by 2050 from 2007 levels. However, under the Reduction Scenario (i.e. implementation of the actions and opportunities identified in the Draft Plan), G.H.G. emissions in Oshawa are estimated to decrease 17% by 2030 and 37% by 2050 from 2007 levels (see Graph 2).



The G.H.G. emissions reductions under the Reduction Scenario do not achieve the City’s target of an 80% reduction in community G.H.G. emissions by 2050 from 2007 levels. The City is currently estimating a reduction of 37%. Not achieving the target is attributed mainly to the projected population increase in Oshawa. Nevertheless, it is important to not draw any early conclusions from the analysis.

The results from the Scenario Builder should be understood as high-level estimates, rather than a forecast of future emissions. Furthermore, the estimate does not account for the

following, which may in the future help to achieve the target reduction of 80% by 2050 even in the face of an increased population:

- Opportunities identified in the Draft Plan that are difficult to quantify (i.e. education programs, decision-making tools, etc.);
- More efficient technological advances that may be available in the future; and,
- Carbon sequestration initiatives that help reduce G.H.G. emissions (i.e. afforestation, reforestation, etc.).

Oshawa's anticipated growth presents the City with a unique opportunity to show leadership in reducing G.H.G. emissions while accommodating a rapidly increasing population. The outcome of the actions identified in the Draft Plan and their associated co-benefits will have a positive impact on Oshawa residents.

5.4 Next Steps

Pursuant to Report DS-17-197 dated November 30, 2017, one public meeting will be held by the Development Services Committee on the Draft Plan, with advertisements in the local newspapers and communicated through the City's social media accounts and websites.

In addition, the following is a list of the next steps for finalizing the Draft Plan:

- Revise the Draft Plan to include feedback from the public meeting, as appropriate;
- Engage with the public, City advisory committees and stakeholders on the Draft Plan including online and paper surveys;
- Report back to Committee and Council on the final Community G.H.G. Reduction Plan for endorsement;
- Submit the Council-approved Community G.H.G. Reduction Plan as Milestone 3 of the P.C.P. Program to the Federation of Canadian Municipalities for review and approval;
- Develop an implementation strategy for the Council-approved Community G.H.G. Reduction Plan (including a description of the degree to which measures have been implemented, implementation partners, financing mechanisms and an implementation schedule); and,
- Report back to Committee and Council as required.

6.0 Financial Implications

Financial implications associated with the recommendation in this report include newspaper advertising costs associated with the consultation process, including one public meeting, which can be accommodated in the 2020 Departmental budgets.

The estimated costs of each program identified in Attachment 3 will be included in the final Community G.H.G Reduction Plan, presented to Committee and Council for endorsement.

Implementation of the programs identified in Attachment 3 will require future budget approval as necessary.

7.0 Relationship to the Oshawa Strategic Plan

The recommendations in this report relate to the Accountable Leadership and Environmental Responsibility goals of the Oshawa Strategic Plan.



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Warren Munro, HBA, RPP, Commissioner,
Development Services Department



Public Report

To: Development Services Committee

From: Paul D. Ralph, BES, RPP, MCIP, Commissioner,
Development Services Department

Report Number: DS-16-25

Date of Report: February 3, 2016

Date of Meeting: February 8, 2016

Subject: Federation of Canadian Municipalities' Partners for Climate
Protection Milestone 3 Submission - Corporate Plan

File: F-7000-0027

1.0 Purpose

The purpose of this report is to obtain Council approval to submit the City's Partners for Climate Protection (P.C.P.) Milestone 3 Corporate Plan to the Federation of Canadian Municipalities (F.C.M.).

Attachment No. 1 is the recommended P.C.P. Milestone 3 Corporate Plan.

2.0 Recommendation

That Development Services Committee recommend to City Council:

That, pursuant to Report DS-16-25 dated February 3, 2016, City Council endorse the City's Partners for Climate Protection Milestone 3 Corporate Plan (Attachment 1 to DS-16-25) as a guideline to reduce energy costs, energy consumption and greenhouse gas emissions and that staff be authorized to submit it to the Federation of Canadian Municipalities for review and approval.

3.0 Executive Summary

The City of Oshawa is a member of the Federation of Canadian Municipalities' Partners for Climate Protection program. This program is a voluntary, five-milestone framework to help municipalities reduce energy costs, energy consumption and greenhouse gas (GHG) emissions.

P.C.P. members are required to develop corporate (city operations) and community (citywide) plans.

The City has achieved Milestone 1 (establishing a baseline inventory year for corporate and community emissions) and Milestone 2 (setting emissions targets).

This report completes part of the City's commitment for Milestone 3 by creating a corporate plan and provides an update on the City's progress on reducing energy costs, energy consumption and GHG emissions.

4.0 Input From Other Sources

4.1 General

The following have been consulted in the preparation of this report:

- Community Services Department
- Corporate Services Department
- Office of the City Manager
- Federation of Canadian Municipalities
- The following Ontario municipalities: Ajax, Pickering, Oakville, Halton Hills, Burlington, Cambridge, Caledon, City of Waterloo, Waterloo Region, Guelph, Windsor, Simcoe, Peterborough, Hamilton, Aurora, Kingston, Ottawa, King Township, Sudbury, Huntsville and Markham
- Oshawa Environmental Advisory Committee (O.E.A.C.)

On February 2, 2016 O.E.A.C. was presented the Milestone 3 Corporate Plan and passed the following motion:

- “1. That the Timing for Actions A1, A15, B1, B2, D1 and D4 be listed as "ongoing"; and
2. That the following additional actions be included in the report:
 - Invest in electrification of fleet and invest in charging infrastructure
 - Rightsizing vehicles
 - Telecommuting should include shared work spaces
 - Sustainable meeting guidelines be developed
 - Anti-idling as it relates to D1 Driver Eco-training for city fleet should be included
 - Maintain City Hall diversion rate and roll out the program to other city facilities through annual audits”

All comments of O.E.A.C. have been incorporated into Attachment 1, with the exception of occupancy sensors (Item B2), fleet electrification, charging infrastructure and telecommuting.

The installation of occupancy sensors is completed and the timing should reflect that status. Fleet electrification is addressed by Item C31. Council recently endorsed a joint application for EV Charging stations at various City facilities with the OPUC. Advancing the EV charging stations and telecommuting will be addressed in the Milestone 3 Community Plan.

These changes have resulted in a renumbering of the Items in Attachment 1.

5.0 Analysis

5.1 P.C.P. Program

The P.C.P. program is a voluntary program established by the Federation of Canadian Municipalities (F.C.M.) in 1994. Membership is free.

The P.C.P. program was created to help municipalities take action against climate change through a five-milestone framework:

- Milestone 1 establishes a baseline year for emissions inventories
- Milestone 2 sets emissions reduction targets
- Milestone 3 requires the development of a local action plan (corporate and community plans)
- Milestone 4 is the implementation of the plan
- Milestone 5 involves monitoring and reporting on the success of the plan

The P.C.P. Program also provides project funding through the Green Municipal Fund for the development of community and corporate plans.

5.2 Milestones 1 and 2

On March 9, 2009, City Council adopted the recommendations of Report DS-09-74 to join the P.C.P. Program.

On September 7, 2010, City Council adopted the recommendations of Report DS-10-217 that:

- Established 2007 as the baseline year for the purposes of monitoring and measuring the City's performance;
- Completed an inventory of the City's corporate and community G.H.G emissions, related energy consumption and costs (achieving Milestone 1); and
- Established the following G.H.G. emissions reduction targets for both the community and the corporation (achieving Milestone 2):
 - 5% reduction by 2015 from the 2007 baseline;
 - 20% reduction by 2020 from the 2007 baseline; and
 - 80% reduction by 2050 from the 2007 baseline.

F.C.M. has acknowledged that the City has achieved Milestones 1 and 2.

The above emission reduction targets are the same as the Region of Durham's targets.

5.3 Milestone 3

Milestone 3 requires the City to establish a corporate plan and community plan to reduce energy costs, energy consumption and GHG emissions.

The first priority of the City's P.C.P. Milestone 3 plan is to focus on the City's corporate G.H.G. emissions reduction strategy to "get our own house in order" before going to the public to get input on a future community plan.

The objectives of the corporate plan are to:

- Reduce the environmental impact of the City's corporate energy consumption by reducing the associated G.H.G. emissions;
- Demonstrate the City's leadership in energy conservation and the efficient use of energy in the community;
- Optimize the City's delivery of services to enhance the overall quality of life in our community by controlling energy costs; and
- Create a culture of conservation within the City that encourages actions that will result in the wise use of energy resources.

Milestone 3 requires that the City:

- Provide a description of the planned activities to achieve the reductions set out in Milestone 2;
- Provide a description of how internal stakeholders participated in the development of the plan;
- Provide a description of costs and funding sources; and,
- Identify the municipal departments responsible for the actions outlined in the plan.

The P.C.P. program includes all City emissions sources, including:

- Owned and Operated Facilities;
- Street Lighting;
- Fleet and Fire Services;
- Corporate Waste; and
- Water and Wastewater.

Oshawa does not operate a landfill. The City's G.H.G. emissions from waste are calculated as percentage of total corporate G.H.G. emissions.

The City is not required to report on G.H.G. emissions associated with the processing and delivery of water and wastewater. These services are provided by the Region of Durham.

Staff from each City department and the City Manager's office participated in the process to create the PCP Milestone 3 corporate plan which forms Attachment 1 to this report.

Staff reviewed information from the Ontario municipalities listed in Section 4.0 in order to identify other municipal best practices and potential projects for the City .

Staff also collected data from their respective departments including:

- Energy consumption and costs from 2007 (baseline year) to 2014
- Energy conservation projects and investments in energy efficiency, including those completed, ongoing and proposed

Data analysis indicates that the City achieved a 33% reduction in corporate G.H.G. emissions, exceeding the 2020 reduction target by 13%. During the same period, the City reduced its energy consumption by 2%, while energy costs have increased by 11% (see Table 1).

Table 1: Reportable Energy, Costs and G.H.G. Emissions

Year	Energy used (GJ)	Energy Costs	Tonnes of Carbon Dioxide equivalent (t CO2 e)
2007	291,007	\$6,141,895	16,757
2014	286,375	\$6,811,832	11,157
Difference	-4,632	\$669,937	-5600
% Change	-2%	11%	-33%

The City's actions since 2007 have resulted in reductions in G.H.G. emissions. However, variables beyond the City's control such as energy pricing, extreme weather and other factors will continue to challenge the City's efforts to reduce energy consumption, energy costs and G.H.G. emissions, while delivering core services and meeting the goals of the Oshawa Strategic Plan and Financial Strategy.

After F.C.M. approves the City's Milestone 3 corporate plan submission staff will report to Council on a proposed process to establish a community plan under Milestone 3 which will include a public process.

6.0 Financial Implications

There are no financial implications associated with submitting the Partners for Climate Protection Milestone 3 Corporate Plan to F.C.M. for review and approval.

Implementation of the projects in Attachment 1 will require future budget approval as necessary.

7.0 Relationship to the Oshawa Strategic Plan

This report advances the goals of Economic Prosperity and Financial Stewardship, Accountable Leadership and Environmental Responsibility of the Oshawa Strategic Plan.



Paul D. Ralph, BES, RPP, MCIP, Commissioner,
Development Services Department

Corporate Plan to Reduce Greenhouse Gas Emissions, Energy Consumption and Costs – Milestone 3 F.C.M. Partners for Climate Protection

- Short-term – 1 to 2 years
- Mid-term – 3 to 5 years
- Long-term – 5 to 10 years

A. Capital Projects and System Retrofits

Optimizing energy efficiency and cost avoidance where possible in new capital projects and systems retrofits.

Number	Item	Lead Department	Description	Timing
1.	Solar-powered parking meters	Community Services	Installed solar-powered parking meters	Completed 2010
2.	Ameresco projects (and other identified energy efficiency projects)	Corporate Services Development Services	Replaced heating, lighting, windows, ventilation and heating ventilation and air-conditioning (H.V.A.C) systems at City Hall, the Arts Resource Centre, McLaughlin Library and Robert McLaughlin Art Gallery	Completed 2011
3.	City Hall Revitalization Project (C.H.R.P.) L.E.E.D.(Leadership in Environmental and Energy Design) or comparable green building standard	Corporate Services Development Services	C.H.R.P. built to L.E.E.D. standard	Completed 2011
4.	White rooftops	Corporate Services	Installed white rooftops on certain existing buildings to reduce urban heat island effect (C.H.R.P.)	Completed 2011
5.	Boiler replacement	Corporate Services	Boiler replacement at Seniors Centres	Completed 2012

Number	Item	Lead Department	Description	Timing
6.	Solar panel installation	Corporate Services Community Services	Legends, Donevan, GM Centre and Civic Complex (Panels owned by the Oshawa Power and Utilities Corporation (O.P.U.C.) – roof space is rented from the City)	Completed 2013
7.	Lighting upgrades	Corporate Services	Lights upgraded in buildings City-wide	Completed 2013
8.	Rink upgrades	Corporate Services Community Services	Upgraded and replaced rink equipment, controls and condenser units at Harman Park Arena	Completed 2013
9.	Convert oil furnaces to gas	Corporate Services	Converted furnaces at Bathe Park and Sunnyside Community Centers	Completed 2014
10.	Ultra-violet (U.V.) systems	Corporate Services Community Services	Installed of U.V. systems for Pools at Donevan, Legends, Civic and South Oshawa	Completed 2015
11.	Lighting upgrades	Community Services	Lights upgraded at Alexandra Park Tennis Court	Completed 2015
12.	Fleet upgrades	Community Services	Vehicles replaced and right sized with more energy efficient models. Purchased hybrids where feasible	Ongoing
13.	LED lighting in new subdivisions	Community Services Development Services	Continue to require LED lighting as condition of subdivision approval	Ongoing
14.	H.V.A.C. training	Corporate Services	Staff training on H.V.A.C building automation systems (B.A.S.) to optimize standard scheduling and temperature settings throughout our facilities	Ongoing
15.	Combined Heat & Power (C.H.P.)	Corporate Services Community Services	Install C.H.P. project at Legends Centre	Short-term
16.	LED conversion	Community Services	Convert all older street lighting to LEDs - continue to investigate converting all of City street lights to LED	Short-term

Number	Item	Lead Department	Description	Timing
17.	LED conversion and controls	Corporate Services	Investigate converting lights in the parking garages to LEDs and add motion and photocell sensors to lights	Short-term
18.	LED conversion	Corporate Services Community Services	Convert metal halide lights in the ice rinks, gyms and pools to LED	Short-term
19.	Lighting upgrades	Corporate Services	Upgrade lighting system control at various facilities	Short-term
20.	Rink upgrades	Corporate Services Community Services	Upgrade/replace ice rink control system/equipment, rink controller, roof top condensers and ice plant controls at other arenas	Short-term
21.	Boiler upgrades	Corporate Services Community Services	Investigate and install instant hot water heaters at Northview Community Centre and Civic Complex	Short-term
22.	Solar panel installation	Corporate Services	Conduct a feasibility study to install solar panels at other city facilities	Mid-term
23.	LED conversion	Corporate Services	Gradually replace LED lighting at Legends parking lot	Mid-term
24.	LED conversion	Corporate Services	Convert parking lot high pressure sodium lights and wall packs to LED	Mid-term
25.	LED conversion	Corporate Services	Convert old existing exit signs to the new LED signs	Mid-term
26.	Variable Frequency Drives (VFD)	Corporate Services	Investigate installation of VFDs on Air Handling Unit motors and pump motors at various facilities	Mid-term
27.	Rink equipment controls	Corporate Services Community Services	Install Central Arena De-Ox System, ice pad control and floating head pressure controls for ice rinks	Mid-term
28.	Pool waste heat recovery system	Corporate Services Community Services	Install waste heat recovery system controls to pre-heat the pool water	Mid-term

Number	Item	Lead Department	Description	Timing
29.	B.A.S. upgrades	Corporate Services Community Services	Upgrade of H.V.A.C. - B.A.S. for Donevan and Legends Centre	Mid-term
30.	H.V.A.C. controls	Corporate Services Community Services	Install H.V.A.C. controls for makeup air units and exhaust fans	Mid-term
31.	Aircosaver/economizers	Corporate Services Community Services	Install economizer and aircosaver on roof top units to optimize their use	Mid-term
32.	Equipment upgrades	Corporate Services	Replace old, inefficient equipment with energy efficient technologies at various facilities	Long-term
33.	Electric heaters upgrade	Corporate Services	Replace electric heaters with high-efficiency natural gas boilers at various facilities	Long-term
34.	Vending machines	Corporate Services	Install Energy STAR vending machines – various facilities	Long-term
35.	Building insulation	Corporate Services Community Services	Air seal the building – Children’s Arena	Long-term
36.	Green roof installation	Corporate Services	Undertake a feasibility study to determine retrofitting existing building. Adopt green roof top policy for all new city buildings	Long-term
37.	Solar pool heating	Corporate Services Community Services	Undertake feasibility study for solar pool heating	Long-term

B. Technical Measures

Optimizing energy efficiency and cost avoidance where possible – focusing on low/no cost opportunities, before investing in new capital equipment or systems retrofits

Number	Item	Lead Department	Description	Timing
1.	Install occupancy sensors in City Hall parking garage	Corporate Services	Ensured that light levels are adequate for safety and security	Completed 2013 to 2014

Number	Item	Lead Department	Description	Timing
2.	Printer and photocopier conversion	Corporate Services	Replaced printers and photocopiers with "smarter" more efficient models. Reduced paper consumption by more than 50%	Completed 2015
3.	Upgrade computers	Corporate Services	Replaced existing stock with models that are 50% more efficient	Completed January 2014 to December 2015
4.	Internal energy assessment (energy audits)	Corporate Services	Identified opportunities to improve energy efficiency	Ongoing
5.	LYNC System	Corporate Services	Allows virtual meetings, webinars	Ongoing
6.	Monthly monitoring	Corporate Services	Identify areas for improvement, measure and verify	Ongoing
7.	Retro-commissioning building systems	Corporate Services	Review operations and maintenance procedures to identify low-cost/no cost operational and maintenance improvements for building systems	Short-term
8.	Computer "wake up" software	Corporate Services	Automate the computer software updating process to include 'waking up' machines when necessary so that staff will be able to shut them off entirely when they have finished using them	Short-term

C. Organizational Objectives and Measures

Promotion of energy efficiency across the corporation, including policies and procedures

Number	Item	Lead Department	Description	Timing
1.	Switch to recycled paper	City Managers Office (Purchasing)	Reduced energy impact of processing and printing "virgin" paper	Completed 2008
2.	Adopt greenhouse gas (G.H.G.) and energy emission targets	Development Services	Completed the Milestone 2 of Partners for Climate Protection (P.C.P.) program	Completed 2010

Number	Item	Lead Department	Description	Timing
3.	Facility conservation challenges	Corporate Services Community Services	Provide training for operational and program staff at City Recreation facilities and fire halls to reduce electricity and gas consumption	Ongoing
4.	Mayors' Megawatt Challenge	Corporate Services	Benchmarking of municipal facilities to identify opportunities for energy efficiency and cost avoidance	Ongoing
5.	Asset renewal capital projects	Corporate Services	Identify opportunities to incorporate energy efficiency	Ongoing
6.	Energy efficiency for new buildings and major renovations	Corporate Services	Ensure that design incorporates energy efficiency, renewable energy, sustainable measures that are economically feasible	Ongoing
7.	Pre-approval for incentives	Corporate Services	Obtain pre-approval of incentives from utility companies so that the incentive to be received can be included in the payback calculations	Ongoing
8.	Use of renewable fuels	Community Services	Use renewable fuels where feasible	Ongoing
9.	Energy savings reports	Corporate Services	Facilities Management Services reviews savings from funded projects	Ongoing
10.	Equipment documentation	Corporate Services	Ensure that critical building and equipment documentation is up-to-date and available for use in energy surveys/audits/retro- commissioning	Ongoing
11.	Budget alignment	City Managers Office (Finance) Corporate Services	Coordinate City Facility Energy Management Plan (CFEMP) with City's budget planning process	Ongoing
12.	Report energy and water use data	Corporate Services	Provide data for City's corporate inventory and Oshawa Strategic Plan reporting	Ongoing
13.	G.H.G. data	Corporate Services	Provide emissions data for CFEMP reporting	Ongoing
14.	Grants and Incentives	Corporate Services	Actively pursue grants, financial incentives for energy projects	Ongoing

Number	Item	Lead Department	Description	Timing
15.	Maximize existing budget allocation	Corporate Services	Where possible, use operating budget for small projects (i.e. lighting replacement) rather than going through capital budget	Ongoing
16.	Return on Investment (R.O.I.) Assessment	City Managers Office (Finance)	Verify actual energy savings and R.O.I. on implemented projects	Ongoing
17.	Lifecycle Cost Analysis	Corporate Services	Employ methods that consider costs that are incurred over the life of a piece of equipment rather than just considering the initial capital cost	Ongoing
18.	Tree Canopy	Community Services	Inventory and increase tree canopy	Ongoing
19.	Bundle projects	Corporate Services	Bundle projects with a longer payback with projects having a shorter payback to achieve a shorter overall payback period	Ongoing
20.	Review Purchasing By-law/green purchasing policies	City Managers Office (Purchasing)	Ensured purchasing policies and guidelines incorporate cost-effective energy efficiency requirements	Short-term
21.	Evaluate funding opportunities	City Managers Office (Finance)	Evaluate borrowing capital or project funding opportunities provided by Energy Service Companies (E.S.C.O.) to fund energy efficiency projects	Short-term
22.	Energy savings reinvestment fund	City Managers Office (Finance)	Explore development of a savings reinvestment mechanism whereby savings (at least 50%) from energy efficiency projects can be re-invested into proposed energy efficiency improvements. Explore the possibility of creating a fund from: documented energy savings, incentive payments received for completed projects and energy commodity purchase price savings	Short-term
23.	Sustainable Energy Policy	Corporate Services	Investigate policy to promote/explore/evaluate renewable technologies and purchase green power	Short-term

Number	Item	Lead Department	Description	Timing
24.	Business travel policy	City Managers Office (Human Resources)	Promote more efficient travel modes for travel outside city (no-cost, quick win)	Short-term
25.	Business travel – carbon offsetting	City Managers Office (Human Resources)	When travelling by plane, City purchases carbon offset	Short-term
26.	Telecommuting policy	City Managers Office (Human Resources)	Explore a policy for staff for local travel (no-cost, quick win)	Short-term
27.	Motion sensor pilot	Corporate Services Community Services	Explore a pilot demonstration involving motion sensors and/or solar lighting for parks and walkways	Short-term
28.	G.H.G. management software systems	Corporate Services	Investigate options	Short-term
29.	Key performance indicators (K.P.I.s)	All	Formalize K. P. I.s related to energy management	Short-term
30.	Occupancy policy	Corporate Services	Investigate policy and building control standards based on building occupancy to reduce heating and cooling of unoccupied areas	Mid-term
31.	Fuel cells and alternative fuels	Community Services	Investigate fuel cell technology for City fleet vehicles, propane, natural gas, ethanol, biodiesel and electricity	Mid-term
32.	Street dimming	Community Services	Investigate feasibility of retrofitting older street lights to allow dimming (Note: All of new street light fixtures have dimming capability)	Mid-term

D. Behavioral Measures – Implementation of energy conservation and efficiency awareness

Number	Item	Lead Department	Description	Timing
1.	Staff review of Corporate Facilities Energy Management Plan	Corporate Services	Provide an opportunity for staff to: understand the goals and objectives of this plan and the need for this plan, review and obtain buy-in to the plan	Completed 2014
2.	Eco-Driver training	City Managers Office (Human Resources)	Provided a green driving course with anti-idling training for staff driving fleet vehicles	Ongoing

Number	Item	Lead Department	Description	Timing
3.	Fleet optimization	Community Services	Determine optimal routes for fleet vehicles and undertake corrective maintenance	Ongoing
4.	Sustainable Meeting Guidelines	Development Services	Prepare Sustainable Meeting Guidelines to guide staff in hosting sustainable meetings	Short-term
5.	Waste Audit of City Facilities	Community Services	Increase diversion rates from 70 to 90% at City Hall by providing blue boxes, green bins, removing garbage cans – provided staff education throughout the process. Undertake audits at other City facilities	Mid-term



Public Report

To: Development Services Committee

From: Paul D. Ralph, BES, RPP, MCIP, Commissioner,
Development Services Department

Report Number: DS-17-197

Date of Report: November 30, 2017

Date of Meeting: December 4, 2017

Subject: Proposed Terms of Reference for the City's Community
Greenhouse Gas (G.H.G.) Reduction Plan under the
Federation of Canadian Municipalities' Partners for Climate
Protection Program

File: F-7000-0027

1.0 Purpose

The purpose of this report is to obtain Council approval for the Terms of Reference for the preparation of the City's Community Greenhouse Gas (G.H.G.) Reduction Plan under the Federation of Canadian Municipalities' (F.C.M.) Partners for Climate Protection (P.C.P.) Program.

2.0 Recommendation

That the Development Services Committee recommend to City Council:

That, pursuant to Report DS-17-197 dated November 30, 2017, City Council endorse the Terms of Reference, as outlined in Section 5.4 of said Report, for the preparation of the City's Community Greenhouse Gas (G.H.G.) Reduction Plan under the Federation of Canadian Municipalities' Partners for Climate Protection Program.

3.0 Executive Summary

The City of Oshawa is a member of the Federation of Canadian Municipalities' Partners for Climate Protection program. This program is a voluntary five-milestone framework to help municipalities reduce energy costs, energy consumption and greenhouse gas emissions.

Program members are required to develop both Corporate (city operations) and Community (citywide) plans.

The City approved a Corporate G.H.G. Reduction Plan on March 8, 2016. The City was recognized for its completion of the Corporate G.H.G. Reduction Plan at the 2017 annual Federation of Canadian Municipalities Conference in Ottawa.

The Community G.H.G. Reduction Plan will be developed in cooperation with community stakeholders and public consultation in accordance with the Terms of Reference outlined in Section 5.4 of this report.

4.0 Input From Other Sources

4.1 General

The following have been consulted in the preparation of this report:

- F.C.M.
- Other municipalities that have Community G.H.G. Reduction Plans (e.g. City of Vaughan)

5.0 Analysis

5.1 P.C.P. Program

The P.C.P. Program is a voluntary program established by F.C.M. in 1994. Membership is free.

The P.C.P. Program was created to help municipalities take action against climate change through a five-milestone framework:

- Milestone 1 establishes a baseline year for emissions inventories
- Milestone 2 sets emissions reduction targets
- Milestone 3 requires the development of a local action plan (corporate and community plans)
- Milestone 4 is the implementation of the plan
- Milestone 5 involves monitoring and reporting on the success of the plan

5.2 Milestones 1 and 2

On March 9, 2009, City Council adopted the recommendations of Report DS-09-74 to join the P.C.P. Program.

On September 7, 2010, City Council adopted the recommendations of Report DS-10-217 that:

- Established 2007 as the baseline year for the purposes of monitoring and measuring the City's performance;
- Completed an inventory of the City's corporate and community G.H.G emissions, related energy consumption and costs (achieving Milestone 1); and
- Established the following G.H.G. emissions reduction targets for both the community and the corporation (achieving Milestone 2):
 - 5% reduction by 2015 from the 2007 baseline;
 - 20% reduction by 2020 from the 2007 baseline; and

- 80% reduction by 2050 from the 2007 baseline.

F.C.M. has acknowledged that the City has achieved Milestones 1 and 2.

The above emission reduction targets are the same as the Region of Durham's targets.

5.3 Corporate G.H.G. Reduction Plan

On February 22, 2016, City Council approved the recommendation of Report DS-16-25, which outlined the City's Milestone 3 Corporate G.H.G. Reduction Plan and authorized staff to submit it to F.C.M. for review and approval.

Based on this submission, on March 8, 2016, the City received acknowledgement from F.C.M. that it had achieved Milestones 3, 4 and 5 for the City's Corporate G.H.G. Reduction Plan.

On March 21, 2016, City staff presented City Council with the P.C.P. Milestone Trophy for achieving Milestones 3, 4 and 5 for the City's Corporate G.H.G. Reduction Plan.

The City achieved a 33% reduction in corporate G.H.G. emissions from the 2007 baseline by 2014, exceeding the 2020 reduction target.

5.4 Milestone 3 Community G.H.G. Reduction Plan – Terms of Reference

It is now appropriate to initiate the following Terms of Reference for the P.C.P. Milestone 3 Community G.H.G. Reduction Plan. It is hoped that the Community G.H.G. Reduction Plan would be approved by Council before the 2018 election.

5.4.1 Goal

To develop a Community G.H.G. Reduction Plan that is comprehensive, collaborative, community-driven, and recognizes existing regional and local climate change and energy conservation initiatives, policies and plans that already provide direction. The City of Oshawa Community G.H.G. Reduction Plan will identify actions to help achieve the City's long-term G.H.G. emissions reduction target of 80% from the 2007 baseline by 2050.

5.4.2 Objectives

The key objectives of the Community G.H.G. Reduction Plan are to:

- Develop a process that provides meaningful stakeholder and public engagement;
- Highlight existing regional and city plans and policies that implement climate change measures through energy conservation and G.H.G. reductions in the City of Oshawa (i.e. the Region of Durham's Milestone 3 Local Action Plan, the Durham Community Climate Adaptation Plan, the Durham Community Energy Plan, the City of Oshawa's Milestone 3 Corporate G.H.G. Reduction Plan, the Oshawa Strategic Plan and any other applicable City of Oshawa policies and plans such as the Active Transportation Master Plan);

- Review best practices of other Municipal Community G.H.G. Reduction Plans under the P.C.P. Program and use those best practices as a starting point for discussions when formulating actions for the City of Oshawa's Community G.H.G. Reduction Plan;
- Promote and encourage economically viable and environmentally sustainable solutions to reduce G.H.G. emissions; and
- Provide the community with practical approaches and actions to reducing G.H.G. emissions at home, at work and on the move.

5.4.3 Scope

The Milestone 3 Community G.H.G. Reduction Plan will include:

- **Context:** Background information, including an overview of climate change, an overview of the P.C.P. Program, an inventory of existing community G.H.G emissions; an inventory of existing regional and City initiatives, policies and plans to reduce energy consumption and G.H.G. emissions; an overview of best practices from other municipalities' Community G.H.G. Reduction Plans under the P.C.P. Program and an overview of the City's Council approved Corporate G.H.G. Reduction Plan.
- **Actions:** The Community G.H.G. Reduction Plan will identify numerous actions (i.e. new projects, programs and initiatives) and existing opportunities (i.e. implementation of existing policies, by-laws, plans etc.) that can be characterized under one (1) of three (3) areas of focus: At home, At work and On the move.
- **Next Steps:** A list of next steps for plan implementation will be provided. Roles and responsibilities, funding sources, community awareness and engagement and ongoing monitoring and tracking will be addressed, as appropriate.

5.4.4 Community and Stakeholder Engagement

Public consultation and stakeholder engagement is a critical component to the formulation of the Community G.H.G. Reduction Plan. A comprehensive consultation process with City staff, stakeholders and community members will be implemented at key points in the development of the Community G.H.G. Reduction Plan. The consultation process will be supported by a communications plan (e.g. media release, social media messaging, information posted on the City's website, advertisements in local newspapers). The consultation process will include:

- Developing a project page on Connect Oshawa (the City's community engagement website)
- Public workshop and survey
- Stakeholder workshop and survey
- Obtaining input from the Oshawa Environmental Advisory Committee and the Oshawa Active Transportation Advisory Committee

- One public meeting held by the Development Services Committee on the draft Community G.H.G. Reduction Plan, with advertisements in the local newspapers and advertised through the City's suite of social media

Community Stakeholders that will be invited to participate in the stakeholder workshops include, but are not limited to:

- Durham Region
- Durham District School Board
- Durham Catholic District School Board
- University of Ontario Institute of Technology
- Durham College
- Trent University Durham
- Lakeridge Health Oshawa
- Greater Oshawa Chamber of Commerce
- General Motors of Canada
- Building Industry Liaison Team
- Friends of Second Marsh
- Downtown Oshawa Business Improvement Association
- Metrolinx
- Central Lake Ontario Conservation Authority
- Oshawa Power and Utilities Corporation Networks (OPUCN)
- Unifor Local 222
- Tesla
- Representatives from transportation companies
- Durham Sustain Ability
- Oshawa/Durham Youth Councils
- Enbridge Gas
- Ontario Power Generation
- Solar Panel companies
- A representative from the agricultural community

Mayor Henry will send a letter to the community stakeholders requesting their participation in the workshop(s).

5.4.5 Steering Committee

A Steering Committee will be established and comprised of staff members from all Departments. Planning Services will be the lead.

The role of the Steering Committee will be to advance the implementation of the Terms of Reference approved by Council including the development of a recommended Community G.H.G. Reduction Plan in consultation with the public and community stakeholders.

6.0 Financial Implications

Financial implications associated with the recommendation in this report include newspaper advertising costs and the staff costs associated with the process, including workshop(s) which can be accommodated in the 2018 Departmental budgets.

City staff will also identify potential funding partners including F.C.M.'s Green Municipal Fund, the Federal and Provincial government, and the OPUCN.

7.0 Relationship to the Oshawa Strategic Plan

This report advances the Economic Prosperity and Financial Stewardship, Accountable Leadership and Environmental Responsibility goals of the Oshawa Strategic Plan.



Warren Munro, HBA, Director,
Planning Services



Paul D. Ralph, BES, RPP, MCIP, Commissioner,
Development Services Department



Draft Community

Greenhouse Gas Reduction Plan



January 2020

Executive Summary

The Oshawa Community Greenhouse Gas Reduction Plan was completed as a Council priority through the Federation of Canadian Municipality's Partners for Climate Protection program. In coordination with the Oshawa Strategic Plan, Official Plan, Integrated Transportation Master Plan and the Active Transportation Master Plan, this Plan provides direction on how to reduce community-wide emissions over the short and long term.

Through the Partners for Climate Protection program, the City has developed and continues to implement a Corporate Plan, which outlines the actions that will assist the City in conserving energy, reducing energy consumption and greenhouse gas emissions from corporate sources. More recently, the City has endorsed the Corporate Facilities Energy Management Plan in fulfillment of the Government of Ontario's Regulation 507/18 under the Energy Act, 1998.

This Plan was developed through a collaborative process with the public and key community stakeholders. This Plan emphasizes integrating existing initiatives to avoid the duplication of effort, and collaborating with community and industry leaders to work towards a more sustainable future. Oshawa residents were invited to participate in a public workshop and complete a survey to share their ideas on how to combat climate change through the development and implementation of this Plan.

In 2010, City Council endorsed the following Community and Corporate greenhouse gas emission reduction targets (based on a 2007 baseline):

- 5% reduction by 2015;
- 20% by 2020; and,
- 80% by 2050.

An addition, an interim greenhouse gas emission reduction target of 30% below the 2007 baseline levels by 2030 is recommended, to align with the Provincial and Federal governments' targets.

The goal is to develop a plan that is comprehensive, collaborative and community-driven, while recognizing existing regional and local climate change and energy conservation initiatives, policies and plans that already provide direction. The Plan's objectives are to increase renewable energy use, implement policy that reduces greenhouse gas emissions from building and transportation sources and promote sustainability through leadership and education.

In Oshawa, most greenhouse gas emissions come from the use of electricity, natural gas, gasoline and diesel. Research and stakeholder input identified three key areas of focus for reducing greenhouse gas emissions: at home (residential), at work and school (industrial/commercial/institutional) and on the move (transportation). The various actions and opportunities identified in this Plan are characterized under one or more of these areas.

It is important to note that the City cannot meet these community targets on its own and that all community members and stakeholders need to take action. All residents, visitors, businesses, organizations and governments have an important role to play in reducing greenhouse gas emissions in Oshawa.

The City will oversee the implementation of the Plan and work collaboratively to initiate its actions and opportunities, as well as monitor and measure progress. The City will also continue to reduce its corporate emissions through the Corporate Plan and the Corporate Facilities Energy Management Plan.

The approval and implementation of the Plan will have a strong positive impact on the City of Oshawa, including the potential social, economic and environmental benefits that can be achieved. The City of Oshawa is committed to working with our strategic partners to become a more sustainable community.

Message from the City of Oshawa

[Insert message from CAO/Mayor after approved]

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1.0 Introduction

1.1 The Climate Context

What is Causing Climate Change?

Climate change is the significant long-term shift in the expected patterns of average weather over a substantial period of time, and is often referred to as anthropogenic climate change (i.e. caused by human activity). Over the last century, the burning of fossil fuels (such as coal and oil) has increased the atmospheric concentration of Carbon dioxide (CO₂), resulting in a greenhouse gas effect and increased temperatures. Greenhouse gasses (G.H.G.) naturally occur in the environment (e.g. volcanic eruptions, forest fires, etc.), but the G.H.G.s emitted from these events is considered to be nominal and does not drastically affect the global climate. Other sources of G.H.G.s are caused by human activities, such as the burning fossil fuels for energy, waste management practices and gasoline emissions from automobiles, all contributing a significant amount of G.H.G.s released into the atmosphere.

Greenhouse Gas Effect

The greenhouse gas effect is the process by which radiation (heat) from the Earth is trapped by the atmosphere and warms the planet's surface temperature. This is a natural process that is critical to supporting life. However, human activities (such as the burning of fossil fuels) have accelerated the greenhouse gas effect, resulting in global warming.

In 2011, the G.H.G. emissions in Oshawa were mostly comprised of natural gas used for heating buildings (65%), gasoline (11%) and diesel (8%) for automobiles, electricity for lighting and appliances (10%), fuel oil and propane (5%) and community waste (1%). G.H.G. emissions are also linked to land use decisions, agricultural activities and waste management practices.

What Does Climate Change Mean To Oshawa?

Climate change is the most significant challenge that we are facing today and records show that temperatures in Oshawa and around the world are rising. Natural Resource Canada published, *Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation* (2014), which highlighted trends of Canada's changing climate. This document reported that the Canadian landmass has warmed 1.5 degrees Celsius from 1950 to 2010, and it is projected that national temperatures will increase an additional 1.5 to 2.5 degrees Celsius by 2050, with the most significant warming to occur during the winter and spring. Furthermore, the Ministry of Environment, Conservation and Parks (M.E.C.P.) reported that the average

Oshawa Community

The City of Oshawa is located in the centre of Durham Region and is made up of 12 communities, ranging in population size.

By the Numbers:

- Land area: 145.65 km²
- Population in 2007: 148,982
- Population in 2019: 172,434
- Population (forecast) in 2020: 175,709
- Population (forecast) in 2030: 197,014
- Population (forecast) in 2050: 261,076

temperatures in Ontario are projected to rise by approximately 2.5 to 3.7 degrees Celsius by 2050, exceeding the national projections. Cities across Ontario have experienced the extreme weather conditions associated with climate change, such as ice storms and severe flooding. Oshawa residents have experienced the impacts of climate change first hand from the heavy rainfall and flooding of Harmony Creek and Oshawa Creek, rising water levels in Lake Ontario, shoreline erosion and severe wind and ice storms. Extreme weather events caused by climate change pose a significant threat to cities all over the world, and it is important to mitigate the impacts of climate change as much as we can.

What Can We Do About Climate Change?

As the planet warms and extreme weather events become more frequent, the impacts of climate change are hitting closer to home with more heat waves, droughts, floods, and the loss of plant and animal species. It can be difficult to imagine what we as individuals and as a community can do to resolve a problem of this magnitude. The good news is that many of the activities that contribute to climate change are influenced by decisions that are made at a local level. Industries, businesses, schools, and residents in Oshawa can help combat climate change by taking action **at home, at work and school, and on the move.**

The City of Oshawa municipal operations (i.e. facilities, vehicles, streetlights, etc.) only account for approximately 1% of Oshawa’s annual G.H.G. emissions (see Figure 1).

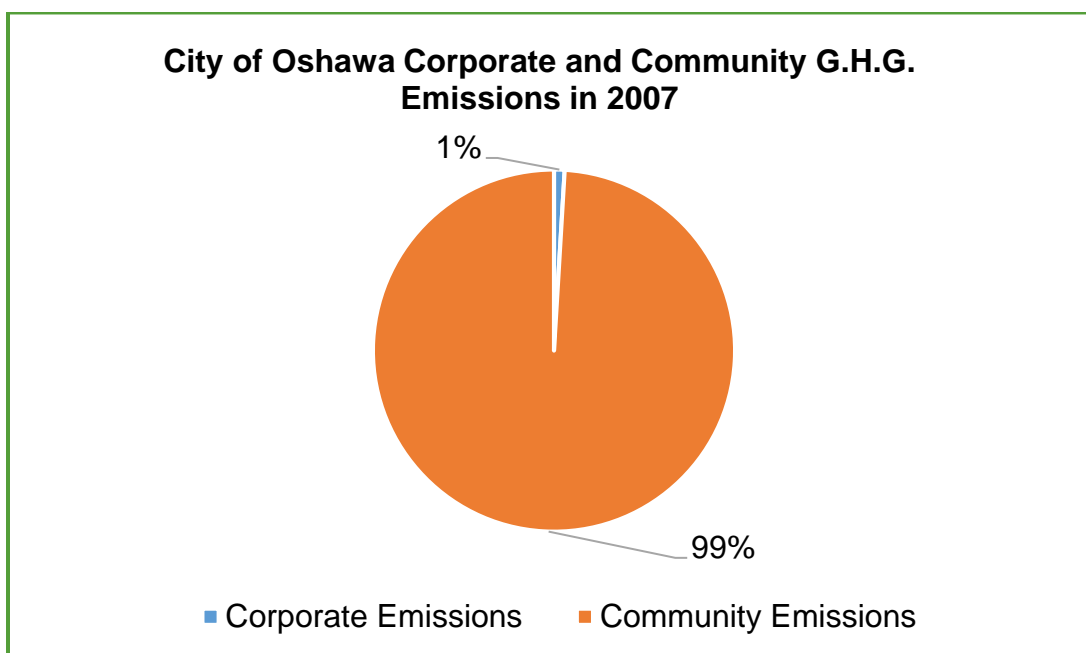


Figure 1: City of Oshawa Corporate and Community Greenhouse Gas emissions (2007)

Unfortunately, even if corporate G.H.G. emissions become net-zero by 2050, the City as a whole may not meet its total G.H.G. reduction target. However, this Plan outlines specific actions and opportunities that will significantly help reduce community G.H.G. emissions in Oshawa.

1.2 Partners for Climate Protection Program

The Federation of Canadian Municipalities (F.C.M.) brings together municipal leaders from across the country to discuss and establish policies on key issues such as, affordable housing, public transit, clean water and climate change. The Partners for Climate Protection (P.C.P.) Program was developed by the F.C.M. in partnership with the International Council for Local Environmental Initiatives (I.C.L.E.I.), and works to create a network of Canadian municipalities who are committed to reducing G.H.G. emissions. The P.C.P. Program uses a five-milestone framework to help municipalities reduce G.H.G. emissions from both corporate and community sources and aims to provide support to municipal and regional governments in identifying and addressing local sources of G.H.G. emissions.

In April 2009, the City of Oshawa, along with over 200 other Canadian municipalities, became a member of the P.C.P. Program, and committed to taking action against climate change by reducing G.H.G. emissions. Through this program, the City of Oshawa committed to participating in the five-milestone framework, to ultimately develop and implement both corporate and community action plans (see Figure 2).



Figure 2: Five-Milestone Framework for the P.C.P. Program by the Federation of Canadian Municipalities

In 2010, Oshawa completed Milestones 1 and 2 for the community action plan, by establishing and submitting a G.H.G. emissions inventory and establishing G.H.G. emissions reduction targets. This Plan, once approved, will satisfy the requirements for Milestone 3 of the P.C.P. program.

Oshawa's Corporate Initiatives – Corporate Facilities Energy Management Plan

- ❖ Optimize energy efficiency without compromising the delivery of services or sacrificing occupant comfort;
- ❖ Promote the use of cleaner, sustainable energy sources in order to reduce G.H.G. emissions;
- ❖ Use renewable energy where feasible;
- ❖ Promote energy efficiency throughout the City's operations by linking the Energy Management Plan to all relevant departments; and,
- ❖ Provide G.H.G. emissions data for the energy used by the City's corporate inventory included in this plan.

In June 2019, City Council approved the C.F.E.M.P. that includes G.H.G. reduction measures such as vehicle fleet upgrades to energy efficient models or hybrid models, investigate alternative fuels for vehicle fleet, and provide Eco-Driver training to city staff who drive fleet vehicles. Oshawa has achieved all five milestones for the Corporate Plan.

2.0 Reducing our Greenhouse Gas Emissions

2.1 Where are we now

In 2010, City Council approved 2007 as the baseline year for setting G.H.G. emissions reduction targets under the P.C.P. Program. Eco-Business Network (formerly Durham Sustain Ability) was contracted to complete a baseline study of Oshawa's community G.H.G. emissions, comparing the following sectors: residential, industrial/commercial, transportation and community waste (the "Study"). This study informed the development of this Plan and the key findings are summarized below.

What is eCO₂?

Equivalent CO₂ (eCO₂) is a unit of measure that allows us to compare the emissions of different greenhouse gasses based on their global warming potential (G.W.P.). For example, the G.W.P. for Methane (CH₄) over 100 years is 21. This means that the emissions of one million metric tons of CH₄ is equivalent to the emissions of 21 million metric tons of CO₂.

2.2 Sources of G.H.G. Emissions

The Study revealed that most of Oshawa's G.H.G. emissions are a result of using natural gas to heat its homes and commercial buildings. The remaining G.H.G. emissions come from gasoline and diesel in vehicles and heavy equipment, and electricity across the residential and industrial, commercial and institutional (I.C.I.) sectors with a nominal amount of G.H.G. emissions come from community waste. In 2019, Environment and Climate Change Canada released *Canadian Environmental Sustainability Indicators: Greenhouse gas emissions*, which noted that G.H.G. emissions in Ontario have decreased approximately 11% since 1990 even through the population has increased. The intent of this Plan is to decrease G.H.G. emissions in Oshawa as the population continues to grow.

The Study also showed that in 2007, the total G.H.G. emissions in Oshawa were 1,761,835 tonnes eCO₂ or 11.8 tonnes eCO₂ per capita. Furthermore, Oshawa's corporate operations only accounted for approximately 0.9% of the total G.H.G. emissions (including city buildings, street lights, fleet and fire services and solid waste). Whereas, community G.H.G. emissions accounted for 99.1% of the total emissions (including the I.C.I. sector, the residential sector, vehicle transportation and community waste) (see Figure 3). In 2007 the industrial/commercial sector was the largest emitter of G.H.G. emissions (74%), followed by transportation (15%), residential (9%) and community waste (2%).

How much is 1,761,835 tonnes of eCO₂/year?

The total amount of G.H.G. emissions produced in Oshawa in 2007 is equivalent to:

- The amount of G.H.G. emissions produced by 374,084 vehicles on the road each year;
- The average amount of energy used by 210,985 homes each year; or,
- The same amount of eCO₂ sequestered by 29,133,968 ten-year old trees in one year.

What does this mean for me?

If we assume that each person was contributing the same amount of G.H.G. emissions, 11.8 tonnes of eCO₂/year would be equivalent to:

- The amount of G.H.G. emissions produced by 2.5 vehicles on the road each year;
- The average amount of energy used by 1.4 homes each year; or,
- The same amount of eCO₂ sequestered by 195 ten-year old trees in one year.

In 2015, the City received an updated G.H.G. emissions inventory as part of the community inventory update for the Region of Durham (the “2015 Inventory”). The 2015 Inventory provided energy and emissions data for the 2007 baseline year, 2011 and 2015 and provided a breakdown of energy consumption and G.H.G. emissions by source (see Figures 3 and 4).

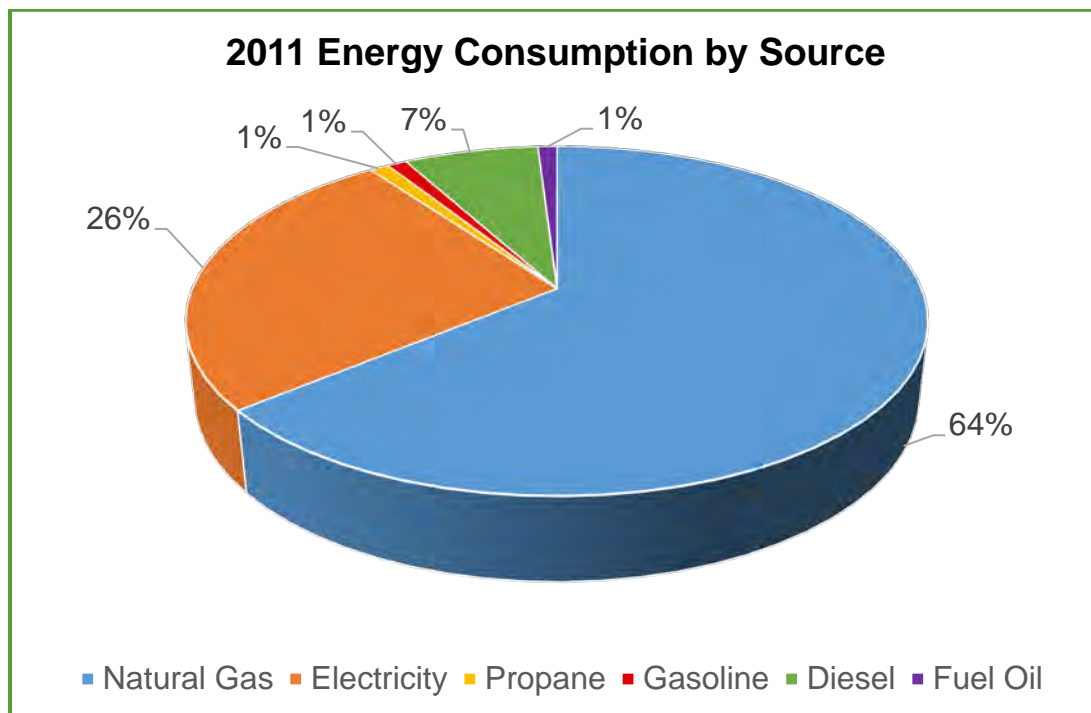


Figure 3: City of Oshawa community energy consumption by source (2011)

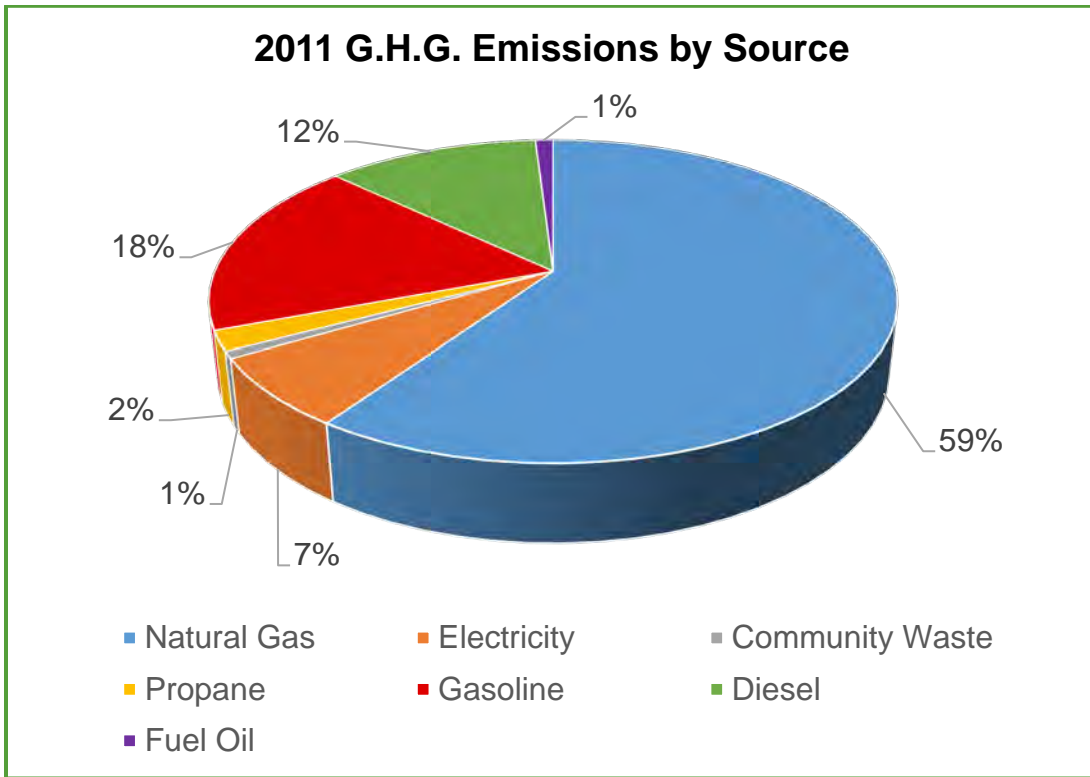


Figure 4: City of Oshawa community greenhouse gas emissions by source (2011)

Oshawa is facing a challenge to reduce G.H.G. emissions while accommodating a rapidly growing population. The City’s population is expected to grow significantly, reaching approximately 261,076 by 2050 (Source: I.C.L.E.I., 2019). If nothing is done to reduce emissions from community sources in Oshawa, G.H.G. emissions are projected to increase significantly. It is crucial that the City takes action to reduce G.H.G. emissions from all sources to mitigate the impacts of climate change.

Note: The projected 2050 population was provided by I.C.L.E.I. for the purposes of this Plan and is based on an annual growth rate of 1.4% in 2020 and 2030 and 2.2% in 2050.

2.3 A Path Forward

In consultation with I.C.L.E.I., City staff used the Milestone 3 Scenario Builder tool provided by F.C.M. and I.C.L.E.I. to estimate the potential G.H.G. emission reductions from the various actions identified in this Plan. The various actions identified in this Plan may help reduce G.H.G. emissions from the following sectors: residential, I.C.I. and transportation. The following graph shows the emissions reductions by sector and the remaining emissions to achieve the City’s identified targets of 20% by 2020 and 80% by 2050, as well as an unofficial target of 30% by 2030 (see Figure 5).

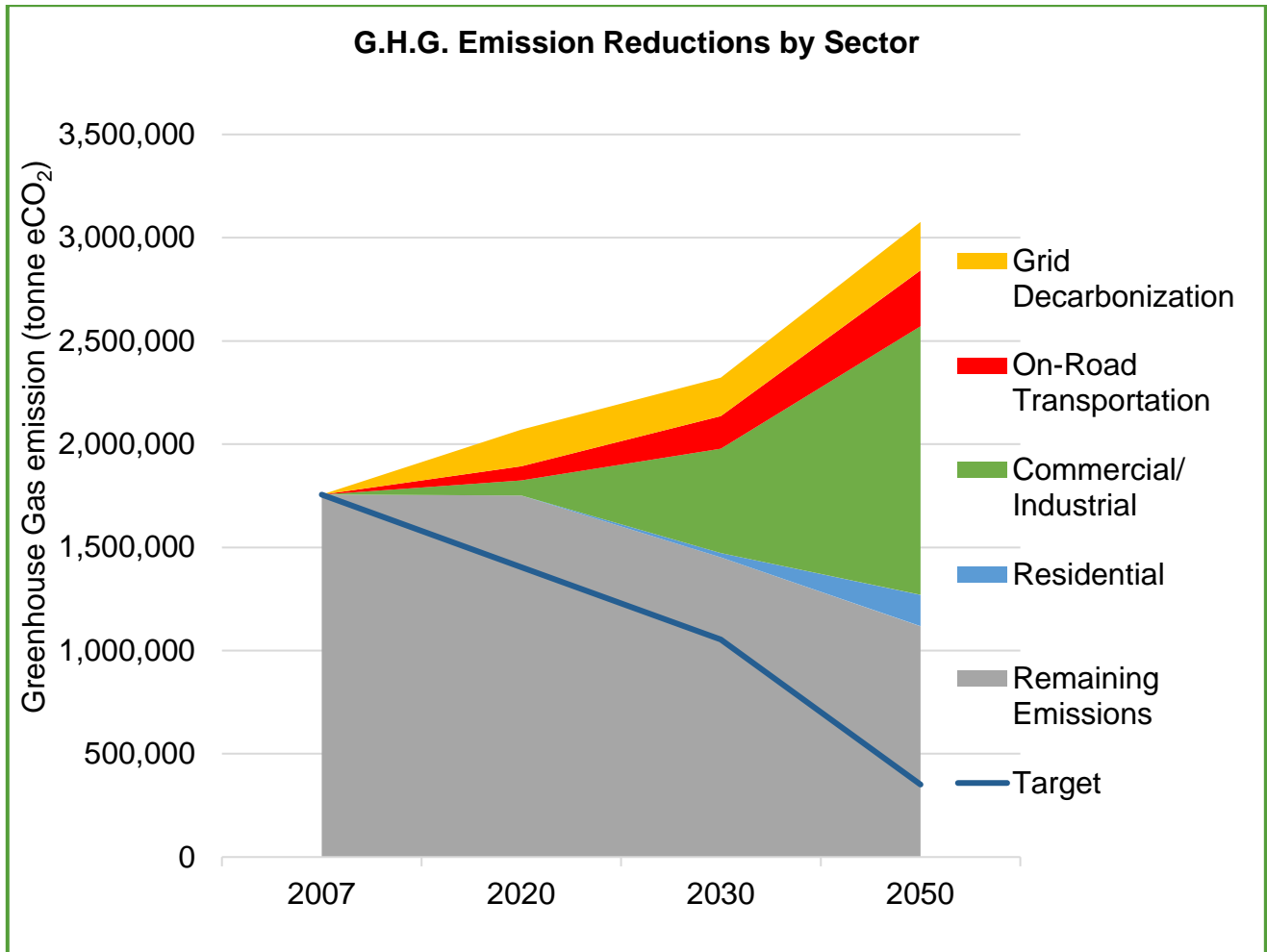


Figure 5: G.H.G. Emission Reductions by Sector

The “Business-as-usual” scenario considers current patterns of energy consumption and G.H.G. emissions and extrapolates it to 2050, while accounting for population increases, fuel efficiency standards and the potential future impacts of climate change on infrastructure. On the other hand, the “Reduction Scenario” considers the actions and opportunities identified in this Plan and their impact on reducing G.H.G. emissions in Oshawa.

The data analysis showed that if Oshawa were to continue under a Business-as-usual scenario, G.H.G. emissions are estimated to increase 75% by 2050 from 2007 levels. However, under the Reduction Scenario, G.H.G. emissions are estimated to be 66% lower than the Business-as-usual scenario and 37% lower than baseline levels (see Figure 6).

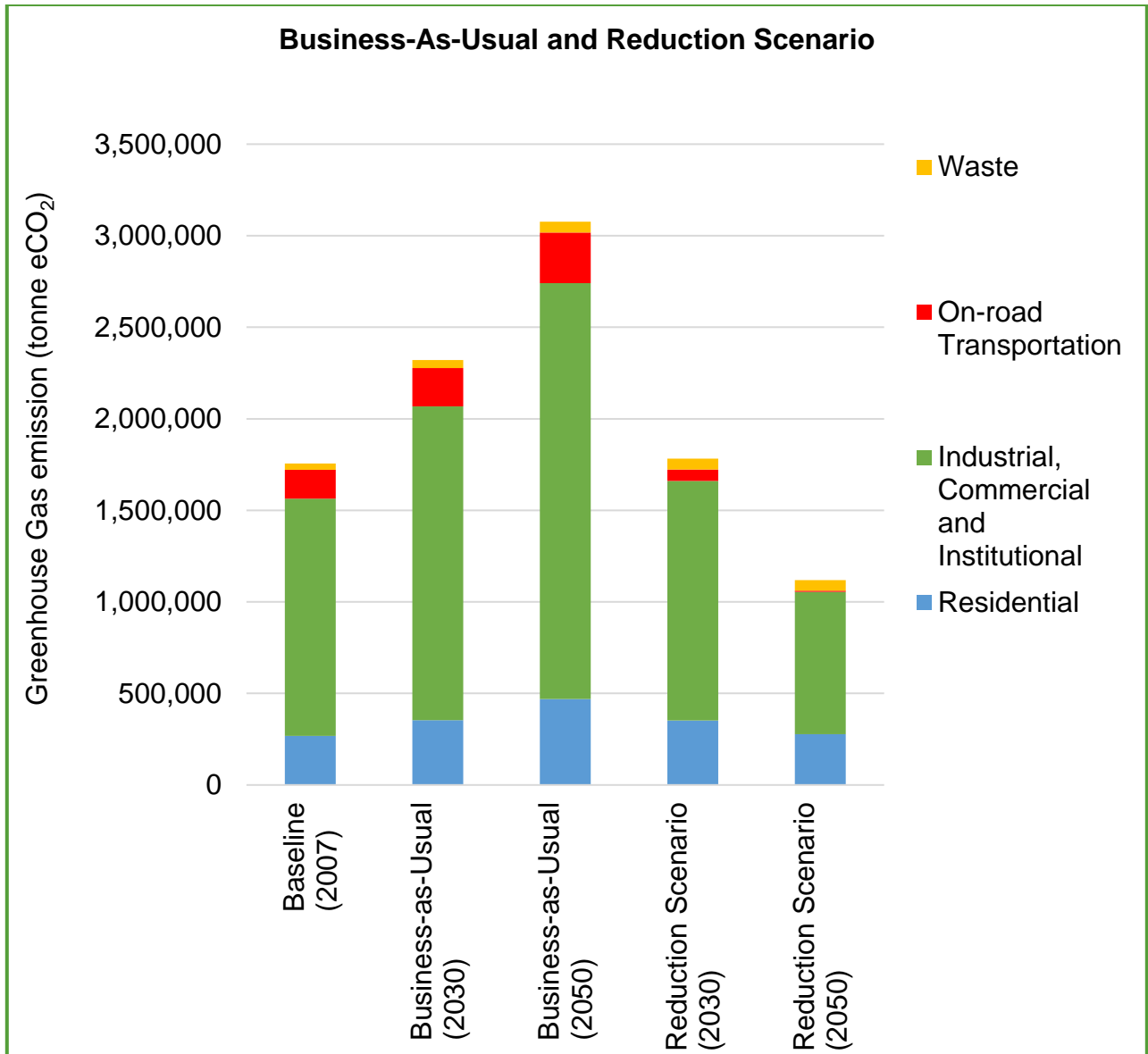


Figure 6: City of Oshawa Business-as-Usual and Reduction Scenario

The G.H.G. emission reductions under the Reduction Scenario do not achieve Oshawa’s official target of an 80% reduction in Community G.H.G. emissions by 2050 from the 2007 baseline. Not achieving the target is attributed mainly to the projected population increase in Oshawa. However, it should be noted that the data analysis results from the Scenario

Builder tool should be understood as high-level estimates, rather than a forecast of future emissions. Furthermore, the estimate does not account for the following:

- Opportunities identified in the Plan that cannot be accurately quantified (i.e. education programs);
- More efficient technological advances that may be available in the future; and,
- Carbon sequestration initiatives that help reduce G.H.G. emissions (i.e. afforestation, reforestation, etc.).

What impact will this target have?

Under the Reduction Scenario, by 2050 the actions and opportunities identified in this Plan will have roughly the same impact as:

- Taking 415,522 vehicles off the road each year;
- Turning off the energy used in 234,356 homes in one year; or
- The work of 32,361,212 ten-year old trees capturing and storing carbon for one year.

What does this mean for me?

This means that each person should reduce their G.H.G. emissions by 4.3 tonnes of eCO₂ to 7.5 tonnes of eCO₂ per year. A reduction of 4.3 tonnes of CO₂ can be achieved by:

- Driving an electric vehicle vs. a gasoline-powered vehicle for the year;
- Driving a gasoline-powered vehicle approximately 17,000 kilometres less each year; or,
- Replacing all incandescent light bulbs at home with light-emitting diodes (L.E.D.s).

2.4 A Collaborative Effort

This Plan was developed through a collaborative process that included public and stakeholder input from various sectors across Oshawa. Staff undertook a public consultation process to engage community members and stakeholders on the development of this Plan. The feedback from the consultation was used to inform the objectives and actions in this Plan at various stages.

Internal stakeholders from various departments at the City (i.e. Planning Services, Engineering Services, Operations, Facilities Management Services, Strategic Initiatives, Innovation, etc.), and provided input and direction on the objectives, actions and opportunities identified in this Plan.

Collaboration and consultation were fundamental in developing this Plan, as many of the identified actions and opportunities require the collaboration of different groups to achieve our G.H.G. targets.

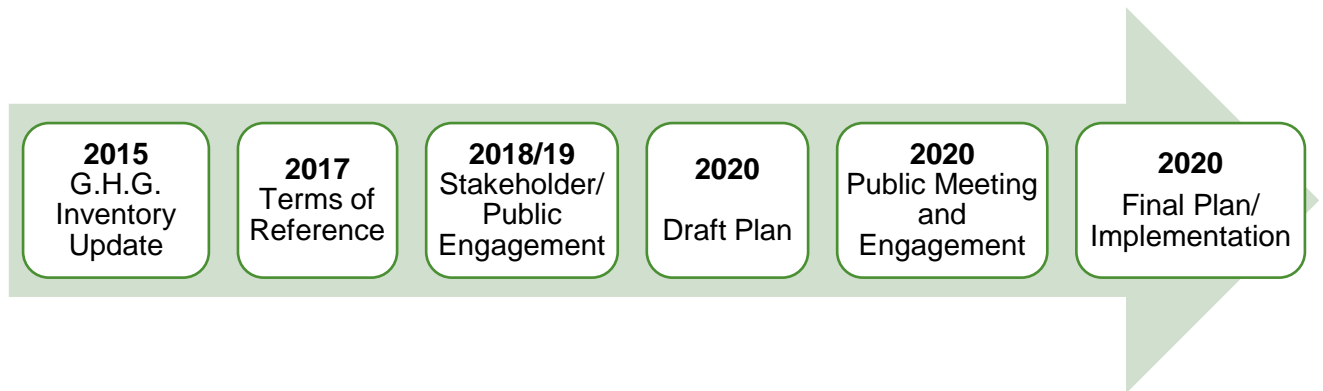


Figure 7: Plan development timeline.

3.0 Framing the Plan

3.1 Alignment with Other Plans, Policies and Initiatives

Goal:

To develop a Community G.H.G. Reduction Plan that is comprehensive, collaborative, community-driven and recognizes existing regional and local climate change and energy conservation initiatives, policies and plans that already provide direction.

This Plan will contribute to meeting regional, provincial and national climate change goals. On December 12, 2015, the Government of Canada signed the Paris Agreement, which aims to strengthen the global response to the threat of climate change by:

- Holding the increase in global average temperature to well below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 degrees Celsius above pre-industrial levels;
- Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low G.H.G. emission development in a manner that does not threaten food production; and,
- Making finance flows (i.e. investment, trade, spending, etc.) consistent with a pathway towards low G.H.G. emissions and climate resilient development.

Under the Paris Agreement, Canada committed to reducing its G.H.G. emissions by 30% below 2005 levels by 2030. Similarly, the Province of Ontario's Made-in-Ontario Environment Plan commits to reducing G.H.G. emissions in Ontario by 30% below 2005 levels by 2030.

In 2019, Durham Regional Council endorsed the Durham Community Energy Plan (D.C.E.P.) in principle, which aims to reduce G.H.G. emissions across the region by 80% by 2050 from 2007 levels. Oshawa City staff are working with Regional staff to implement the following programs identified in the D.C.E.P:

- Durham Green Standard: Enhanced energy performance for new buildings;
- Durham Deep Retrofit: Transforming existing buildings;
- Renewable Energy Co-operative: Stimulating local renewable energy projects;
- Electric Vehicle Joint Venture;
- Education and Outreach Program: Engaging the community; and,
- Coordinating Land-use Policies: Sustainable growth.

City of Oshawa plans, such as the Oshawa Strategic Plan, the Integrated Transportation Master Plan (I.T.M.P.) and the Active Transportation Master Plan (A.T.M.P.), the Corporate Plan and the C.F.E.M.P. will also be supported by this Community G.H.G. Reduction Plan. Oshawa's Strategic Plan, *Our Focus, Our Future, 2015-2019*, includes environmental responsibility as one of the five strategic goals. One of the identified strategies the Strategic Plan is to develop and implement corporate and community plans to reduce greenhouse gas emissions, improve air quality, and continue to reduce energy use, which will be accomplished through this Plan.

3.2 Plan Objectives

The City of Oshawa has shown leadership in sustainability through various initiatives such as in energy conservation, brownfield development, and supporting the work of the Oshawa Environmental Advisory Committee. The objectives in this Plan will expand upon existing actions from other City plans, strategies and initiatives, and will identify specific actions and opportunities that will contribute to G.H.G. emission reductions in our community. The objectives of the Plan are:

- Increase renewable energy use;
- Implement policy that promotes energy efficiency in buildings and transportation; and,
- Promote sustainability through leadership and education.

Many of the actions and opportunities described below will impact various sectors (i.e. transportation, residential and commercial), because sustainability is a multidisciplinary issue. Furthermore, the actions and opportunities in this Plan are related to existing City and Regional policies and programs. However, the City is not currently committed to this suite of actions as a whole.

3.3 Actions at Home

Action 1: Increase Renewable Electricity Generation from Renewable Sources in Residential Buildings.

Renewable forms of energy produce less G.H.G. emissions and can contribute to reducing the urban heat island effect and improving overall air quality. Increasing renewable energy use at home will also help reduce energy costs for home owners and renters.

Increasing electricity generation from renewable energy sources in residential buildings will be advanced by:

- Engaging with Oshawa Power and Utilities Corporation (O.P.U.C.) to explore and identify potential residential renewable electricity generation projects within the City (i.e. solar panels, etc.).

Spotlight on Community Leaders

O.P.U.C., in partnership with the City of Oshawa and New Energy and Industrial Technology Development Organization (N.E.D.O.), a Japanese governmental organization that promotes research in the renewable energy field, successfully piloted one of the first grid-friendly residential solar-plus-storage systems of this scale in North America.

The five year pilot project examined the efficiency and reliability of residential solar energy management systems (S.E.M.S.) in a live setting, while also defining business cases appropriate for the Canadian market. The goal of the S.E.M.S. pilot was to demonstrate and quantify beneficial climate change outcomes, as well as benefits to customers and the utility. The \$1.2 million initiative involved the participation of 30 Oshawa homes, utilizing solar energy, an advanced smart inverter and a lithium-ion battery to simultaneously produce, store and manage energy from their own home.

In 2016, participating homes generated 124.8 MWh of electricity from the solar storage systems, which is equivalent to 642,647 km driven or 2,195 trees planted. Additionally, the systems reduced household G.H.G. emissions by approximately 40 gCO₂e/kWh, saving customers up to \$300 per season on their utility bills.

The pilot project concluded in February 2019 and the results of the project are posted on O.P.U.C.'s website at <https://www.opuc.on.ca/solar-energy-management-system/>.

Action 2: Improve Energy Performance in Residential Buildings.

The heating and cooling of residential buildings is one of the largest contributors to G.H.G. emissions in Oshawa. Improving energy performance in residential buildings will help reduce energy costs for home owners and tenants.

Improving energy performance in residential buildings in Oshawa will be advanced by:

- Exploring opportunities for Oshawa residents to participate in the Durham Deep Retrofit Program for residential buildings;
- Working in partnership with Durham Region to investigate advancing on a volunteer basis, the Durham Green Standard program identified in the D.C.E.P.; and,
- Exploring opportunities through the development approval process to advance best practices for the development of energy efficient and climate resilient homes (i.e. white roofs, green roofs, solar panels, etc.).

What You Can Do At Home

Certain habits at home can have a large impact on G.H.G. emissions. You can help by:

- Replacing your lightbulbs with LEDs;
- Buying energy efficient appliances and products;
- Tracking your energy usage;
- Unplugging your devices when they're not in use;
- Properly sorting waste, recycling and organic materials; and
- Participate in programs to install renewable energy technology (e.g. solar) on your property (such as the S.E.M.S. project provided by O.P.U.C. in partnership with N.E.D.O.).

Resources:

- Energy STAR - <https://www.energystar.gov/>
- O.P.U.C. - <https://www.opuc.on.ca/conservation/conservation-tips/>
- Durham Garbage and Recycling – <https://www.durham.ca/en/living-here/garbage-and-recycling.aspx>

3.4 Actions at Work & School

Action 3: Increase Renewable Electricity generation from renewable sources in commercial buildings.

Renewable forms of energy produce less G.H.G. emissions and can contribute to reducing the urban heat island effect and improving overall air quality. In addition, the diversification of Oshawa's energy supply will reduce dependence on fossil fuels and increase the resilience of our energy sector.

Increasing electricity generation from renewable energy sources in commercial buildings will be advanced by:

- Engaging with O.P.U.C. to explore and identify potential commercial renewable electricity generation projects within the City (i.e. solar panels, etc.).

Action 4: Improve energy performance in commercial buildings.

The heating and cooling of commercial buildings is one of the largest contributors to G.H.G. emissions in Oshawa. Improving energy performance in commercial buildings will help reduce operating costs for businesses.

Improving energy performance in commercial buildings in Oshawa will be advanced by:

- Exploring opportunities for Oshawa residents to participate in the Durham Deep Retrofit Program for commercial buildings;

- Working in partnership with Durham Region to advance, on a voluntary basis, the Durham Green Standard program identified in the D.C.E.P.; and,
- Exploring opportunities through the development approval process to advance best practices for the development of energy efficient and climate resilient commercial buildings (i.e. white roofs, green roofs, solar panels, etc.).

What You Can Do At Work & School

Certain habits at work and school can have a large impact on G.H.G. emissions. You can help by:

- Promoting sustainable procurement policies at work and school;
- Turning your computer off when not in use;
- Printing double-sided;
- Using reusable dishes and cutlery; and,
- Replacing bottled water with filtered tap water.

Resources:

- Leadership in Energy and Environmental Design (L.E.E.D.) – <https://new.usgbc.org/leed/>
- BOMA BEST – <http://bomacanada.ca/bomabest/>
- Eco Schools – <https://www.ecoschools.global/>

3.5 Actions On the Move

Action 5: Promote low carbon or no carbon vehicles.

This action focuses on encouraging the use of smaller, more efficient and electric vehicles (E.V.s) that can achieve further reductions in the community's G.H.G. emissions. This program was identified in the D.C.E.P. as a collaborative effort to promote and provide incentives for electric vehicle use.

Promoting low carbon or no carbon personal vehicles in Oshawa will be advanced by:

- Working in partnership with Durham Region to advance the proposed Electric Vehicle Joint Venture program identified in the D.C.E.P.;
- The City, in partnership with O.P.U.C., is continuing to explore opportunities to install E.V. chargers throughout the City;
- Exploring the development of policies to support low emissions vehicles – hybrids, plug-in electric, full electric vehicles, electric bikes and scooters (e.g. dedicated parking, vehicle charging stations); and,
- Exploring opportunities to require roughed-in E.V. charging infrastructure in residential and commercial developments at the site plan stage.

Action 6: Increase/improve cycling and walking infrastructure to encourage active forms of transportation.

Providing a variety of safe and reliable transportation options will help shift the primary mode of transportation from automobiles for transit, cycling, rideshare and walking, ultimately reducing G.H.G. emissions.

Increasing and improving cycling and walking infrastructure to encourage active forms of transportation in Oshawa will be advanced by:

- Implementing the actions outlined in the City's I.T.M.P. to support its visions of achieving a balanced, sustainable, multi-modal transportation system in the City of Oshawa. The goals of the I.T.M.P. are to improve mobility, alleviate congestion, and encourage sustainability and multi-modality; and,
- Supporting the steady and strategic implementation of new cycling and pedestrian infrastructure and connectivity in coordination with the Active Transportation Master Plan.

Action 7: Coordinate land-use policies to establish a built form that promotes sustainable growth.

The way cities are planned and built has a significant impact on the amount of energy that is consumed at home, at work and school, and on the move. Encouraging more compact, mixed-use development would help reduce the frequency and length of vehicle trips and make other forms of transportation more viable. Considering climate mitigation in land use planning decisions can result in reduced G.H.G. emissions and encourage more sustainable behaviour.

Coordinating land-use policies to establish a built form that promotes sustainable growth in Oshawa will be advanced by:

- Supporting high-density mixed-use development and encouraging intensification in appropriate locations;
- Supporting further development of the downtown into a highly urban, multi-modal and vibrant destination with a mix of land uses and employment opportunities;
- Exploring the longer term transition of underutilized or vacant commercial centres to vibrant, multi-modal, mixed-use areas in appropriate locations throughout the City;
- Investigating planning tools to encourage higher performance buildings, passive design and renewable energy (e.g. streamlining the approval of permits, etc.); and,
- The City, through the Official Plan, encourages home occupation in areas designated as residential, and internet providers (i.e. Bell and Rogers) are exploring opportunities to provide higher quality fibre powered networks in older neighbourhoods. This will provide more opportunity for Oshawa residents to work from home and help reduce G.H.G. emissions from transportation.

What You Can Do On the Move

How you decide to move around the City can have a large impact on G.H.G. emissions. You can help by:

- Walking, biking or skateboarding to your destination;
- Joining a car share program or carpool with a friend;
- Using public transportation to reduce single-occupancy vehicles on the road;
- Purchasing a vehicle that uses alternative fuels (e.g. E.V.s); and,
- Turning off your car while waiting to reduce idling time.

Resources:

- Durham Region Transit – <https://www.durhamregiontransit.com/en/index.aspx>
- GO Transit – <https://www.gotransit.com/en/>
- Ontario Ministry of Transportation – <https://www.ontario.ca/page/ministry-transportation>
- Smart Commute – <https://smartcommute.ca/>

3.6 Additional Opportunities

Opportunity 1: Promote energy efficient business operations.

The City can increase awareness of energy efficiency and G.H.G. emission reduction best practices, in local businesses by providing knowledge and resources.

The City can work with local partners to promote energy efficiency through incentives and various activities (e.g. eco-business networks) to engage and enable the business community to use energy more wisely and therefore reduce operating costs and increase business resiliency.

Promoting energy efficient business operations in Oshawa will be advanced by:

- Encouraging the creation of green jobs during local economic development planning; and,
- Working with utility providers to engage with local businesses and provide information on available energy savings initiatives, sustainable procurement policies and available renewable energy incentives.

Opportunity 2: Promote sustainable practices through strategic outreach and education.

The City can use its various points of contact to promote and encourage residents and businesses to take action against climate change (i.e. through promotional materials and online communications such as social media and the website).

Promoting sustainable practices through strategic outreach and education will be advanced by:

- Exploring opportunities for strategic outreach and education for:
 - Developers, realtors and other stakeholders to promote energy efficiency, passive design and renewable energy technologies and practices;
 - Property owners and tenants to reduce energy use and invest in renewable on-site energy; and,
- Investigating education and engagement campaigns on climate awareness to emphasize the importance of sustainability.

Opportunity 3: Strengthen the City’s capacity to be a leader in sustainability and implement the actions in this Plan.

The Oshawa Strategic Plan identifies environmental responsibility as a strategic goal, including the following themes:

- Proactive environmental management and combat climate change;
- Cleaner air, land and water;
- Resilient local food system; and,
- Less waste generation.

The City can explore ways to demonstrate its commitment to environmental responsibility and be a leader in reducing G.H.G. emissions.

Strengthening the City’s capacity to be a leader in sustainability and implement the actions in this Plan will be advanced by:

- Exploring opportunities to develop a decision making climate lens that will integrate climate change considerations into the planning and development of staff and Council decisions by considering the environmental impacts, G.H.G. emissions and climate resilience of projects.

3.7. Summary of Actions and Impacts

Actions/Opportunities	Additional Benefits	Potential Partners*	Existing Related Plans
Actions at Home			
Action 1: Increase renewable electricity generation from renewable sources in residential buildings	<ul style="list-style-type: none"> ▪ Improve energy resilience ▪ Reduce energy costs ▪ Improved air quality ▪ Reduce Urban Heat Island 	<ul style="list-style-type: none"> ▪ Durham Region ▪ Durham Area Municipalities ▪ Oshawa Power 	<ul style="list-style-type: none"> ▪ D.C.E.P.
Action 2: Improve energy performance in residential buildings	<ul style="list-style-type: none"> ▪ Reduce home energy costs ▪ Improve climate resiliency ▪ Increase home values ▪ Improved air quality ▪ Reduce Urban Heat Island 	<ul style="list-style-type: none"> ▪ Durham Region ▪ Durham Area Municipalities ▪ Building Industry and Stakeholders ▪ Canada Green Building Council ▪ Durham Home Builders Association ▪ Building Industry Liaison Team (B.I.L.T.) 	<ul style="list-style-type: none"> ▪ D.C.E.P.
Actions At Work and School			
Action 3: Increase renewable electricity generation from renewable sources in commercial buildings	<ul style="list-style-type: none"> ▪ Improve energy resilience ▪ Reduce energy costs ▪ Improved air quality ▪ Reduce Urban Heat Island 	<ul style="list-style-type: none"> ▪ Durham Region ▪ Durham Area Municipalities ▪ Oshawa Power 	<ul style="list-style-type: none"> ▪ D.C.E.P.
Action 4: Improve energy performance in commercial buildings	<ul style="list-style-type: none"> ▪ Reduce operational costs of commercial buildings ▪ Improve climate resiliency ▪ Improved air quality ▪ Reduce Urban Heat Island 	<ul style="list-style-type: none"> ▪ Durham Region ▪ Durham Area Municipalities ▪ Building Industry and Stakeholders ▪ Canada Green Building Council ▪ Durham Home Builders Association ▪ Building Industry Liaison Team (B.I.L.T.) 	<ul style="list-style-type: none"> ▪ D.C.E.P.

Actions/Opportunities	Additional Benefits	Potential Partners*	Existing Related Plans
Actions On the Move			
Action 5: Promote low carbon or no carbon vehicles	<ul style="list-style-type: none"> ▪ Improved air quality ▪ Reduce travel costs ▪ Reduce Urban Heat Island 	<ul style="list-style-type: none"> ▪ Durham Region ▪ Durham Area Municipalities ▪ Oshawa Power 	<ul style="list-style-type: none"> ▪ D.C.E.P.
Action 6: Increase/Improve cycling and walking infrastructure to encourage active forms of transportation	<ul style="list-style-type: none"> ▪ Improved air quality ▪ Increased physical activity ▪ Reduced travel costs 	<ul style="list-style-type: none"> ▪ Durham Region Transportation ▪ Metrolinx ▪ O.A.T.A.C. 	<ul style="list-style-type: none"> ▪ I.T.M.P. ▪ A.T.M.P.
Action 7: Coordinate land-use policies to establish a built form that promotes sustainable growth	<ul style="list-style-type: none"> ▪ Improved air quality ▪ More efficient use of land ▪ Increased physical activity ▪ Shorter commute times ▪ Local economic development 	<ul style="list-style-type: none"> ▪ Durham Region ▪ Durham Area Municipalities ▪ Oshawa Power ▪ O.A.T.A.C. ▪ O.E.A.C. 	<ul style="list-style-type: none"> ▪ Oshawa Official Plan ▪ I.T.M.P. ▪ A.T.M.P.
Additional Opportunities			
Opportunity 1: Promote energy efficient business operations	<ul style="list-style-type: none"> ▪ Energy and water conservation ▪ Reduce business operating costs ▪ Improved corporate image 	<ul style="list-style-type: none"> ▪ Business Improve Area ▪ Durham Home Builders Association ▪ Oshawa Power ▪ O.E.A.C. ▪ B.I.L.T. 	<ul style="list-style-type: none"> ▪ D.C.E.P.
Opportunity 2: Promote sustainable practices through strategic outreach and education	<ul style="list-style-type: none"> ▪ Increased education/awareness of environmental issues ▪ Increased civic engagement on environmental issues 	<ul style="list-style-type: none"> ▪ O.E.A.C. 	<ul style="list-style-type: none"> ▪ D.C.E.P.
Opportunity 3: Strengthen the City's capacity to be a leader in sustainability and implement the actions in this Plan	<ul style="list-style-type: none"> ▪ Increased education/awareness of environmental issues ▪ Increased civic engagement on environmental issues 	<ul style="list-style-type: none"> ▪ Durham Region ▪ Durham Area Municipalities ▪ O.E.A.C. 	<ul style="list-style-type: none"> ▪ O.S.P.

*Lead partners of each identified action and opportunity will be determined before final approval of the Plan.

4.0 Next Steps: Implementing the Plan

4.1 Roles and Responsibilities

Implementing the actions and opportunities identified in this Plan will require the effort and collaboration of many members of the Oshawa community. The City's role is to guide the development and implementation of this Plan, reduce barriers, and coordinate efforts to bring this Plan into fruition. This role can be fulfilled through the existing resources at the City.

4.2 Implementation of the Plan

This Plan provides a foundation for future efforts to reduce energy use and greenhouse gas emissions in Oshawa.

Milestone 4 of the P.C.P. Program requires participating municipalities to consider how the local action plan will be implemented, how the Plan will be integrated into existing plans and policies and how implementation will be scheduled to ensure ongoing support from Council and stakeholders.

In September 2019, Planning staff worked with the City Idea Lab project and asked students to consider the following key question: *how might the City better engage with the community on matters related to sustainability?*

Students were asked to design and pilot a qualitative research project that would help staff understand how to better engage with the community. The final research projects were presented to staff in November 2019. The results from the research projects will be considered in the implementation of this Plan.

In Milestone 4, the following information will be provided to F.C.M.:

- A description of the degree to which measures in the local action plan have been implemented (including implementation partners, financing mechanisms and variations from the original plan); and,
- An implementation schedule.

4.3 Resources and Funding

Ongoing resources and funding are required for the continued implementation of this Plan, and leveraging existing initiatives and resources will be imperative. The City of Oshawa should continue to find ways to leverage existing resources to ensure the actions and opportunities identified in this Plan can be implemented effectively.

The City of Oshawa will provide oversight for the implementation of this Plan, including regular monitoring and reporting of progress and coordinating with partners.

The City may wish to establish a community project fund to support the implementation of the actions identified in this Plan. Community members or organizations may apply for a portion of the fund and demonstrate how their project(s) supports this Plan.

The City of Oshawa, in partnership with its strategic partners, will actively seek funding opportunities to help implement the actions outlined in this Plan.

4.4 Ongoing Tracking and Monitoring

An important part of this Plan is to monitor, measure and report on Oshawa's progress. It is recommended that the City undertake a G.H.G. emissions inventory every five years to monitor the progress of its G.H.G. emission reduction targets (i.e., reduce emissions 80% by 2050 from 2007 levels).

The City will also continue to monitor new technology and developments related to G.H.G. emission reductions and will take advantage of new opportunities as appropriate.

Appendix A: G.H.G. Avoidance Actions and Opportunities

Actions/ Opportunities	G.H.G. Avoidance Potential at 2030 (tonne eCO ₂) ¹	G.H.G. Avoidance Potential at 2050 (tonne eCO ₂) ¹	Estimated Cost ²	Public Acceptance ³
Actions At Home				
Action 1: Increase electricity generation from renewable sources in residential buildings	1,882 ⁴	4,741 ⁴	TBD	TBD
Action 2: Improve energy performance in residential buildings	20,213 ⁵	151,810 ⁵	TBD	TBD
Actions At Work and School				
Action 3: Increase renewable electricity generation from renewable sources in commercial buildings	1,090 ⁶	3,431 ⁶	TBD	TBD
Action 4: Improve energy performance in commercial buildings	505,267 ⁷	1,300,928 ⁷	TBD	TBD
Actions On the Move				
Action 5: Promote low carbon or no carbon vehicles	103,853 ⁸	235,772 ⁸	TBD	TBD
Action 6: Increase/improve cycling and walking infrastructure to encourage active forms of transportation	28,913 ⁹	14,017 ⁹	TBD	TBD

Actions/ Opportunities	G.H.G. Avoidance Potential at 2030 (tonne eCO ₂) ¹	G.H.G. Avoidance Potential at 2050 (tonne eCO ₂) ¹	Estimated Cost ²	Public Acceptance ³
Action 7: Coordinate land-use policies to establish a built form that promotes sustainable growth	26,254 ¹⁰	20,507 ¹⁰	TBD	TBD
Additional Opportunities				
Opportunity 1: Promote energy efficient business operations	11	11	TBD	TBD
Opportunity 2: Promote sustainable practices through strategic outreach and education	11	11	TBD	TBD
Opportunity 3: Strengthen the City's capacity to be a leader in sustainability and implement the actions in this Plan	11	11	TBD	TBD

Notes:

¹ The 2007 and 2020 electricity coefficients were sourced from Oshawa's 2007 G.H.G. Emission Inventory and 2019 National Measures Report respectively. For 2030 and 2050, the grid intensity was projected based on Demand Outlook B of the Ontario Planning Outlook from Independent Electricity System Operator (I.E.S.O.) (<http://www.ieso.ca/sector-participants/planning-and-forecasting/ontario-planning-outlook>).

² The estimated total cost of the actions and opportunities will be determined based on stakeholder feedback obtained during the next stakeholder engagement phase of this Plan.

³ Public acceptance of the actions and opportunities will be determined based on community feedback obtained during the next public engagement phase of this Plan.

⁴ Assumes a residential PV factor of 1064 kWh/kW based on the NRCan Solar Resources Tables (<https://www.nrcan.gc.ca/18366>). Assumes that by 2050, 80% of the residential

buildings that have solar Photovoltaic (P.V.) systems can provide 30% of the buildings electricity consumption.

- ⁵ Assumes that by 2050, new construction residential buildings will be 90% more energy efficient than those built in 2007, and that 50% of existing residential buildings will be retrofitted to achieve 50% energy savings by 2050. The D.C.E.P. cites an internal analysis by the Toronto Atmospheric Fund (T.A.F.) which assumed that the Ontario Building Code (O.B.C.) would be equivalent to the Toronto Green Standard (T.G.S.) v2 Tier 1 by 2017, and that the O.B.C. will follow the evolution of the T.G.S. with a five year lag. Thus the modelling of all new construction assumes a 15% improvement every five years.
- ⁶ Assumes a residential PV factor of 1064 kWh/kW based on the NRCan Solar Resources Tables (<https://www.nrcan.gc.ca/18366>). Assumes that by 2050, a total of 73,050 kW of stationary solar energy will be installed by 2050.
- ⁷ Assumes that by 2050, new construction commercial buildings will be 90% more energy efficient than those built in 2007, and that 50% of existing commercial buildings will be retrofitted to achieve 50% energy savings by 2030 and 80% by 2050. The D.C.E.P. cites an internal analysis by the Toronto Atmospheric Fund (T.A.F.) which assumed that the Ontario Building Code (O.B.C.) would be equivalent to the Toronto Green Standard (T.G.S.) v2 Tier 1 by 2017, and that the O.B.C. will follow the evolution of the T.G.S. with a five year lag. Thus the modelling of all new construction assumes a 15% improvement every five years.
- ⁸ The Government of Ontario's Long Term Energy Plan projects that Ontario will have one million electric vehicles by 2035 (<https://www.ontario.ca/page/ontarios-long-term-energy-plan>). Assumes that personal electric vehicles use will increase incrementally from 2020 and that by 2050, 50% of new personal use vehicle stock will be no carbon or low carbon vehicles.
- ⁹ Assumes that personal vehicles will be used for 50% of all on-road transportation trips by 2030 and 25% by 2050. Other forms of on-road transportation (i.e. passenger, walking, biking, public transportation, etc.) are expected to increase incrementally beginning in 2020.
- ¹⁰ Assumes that the average kilometre travelled by gasoline-powered vehicles per person will decrease 25% by 2030 and 50% by 2050 due to the coordination of land-use policies to establish a built form that promotes sustainable growth and multi-modal communities.
- ¹¹ Indicates actions that have not been quantified in tonne eCO₂ for the purposes of this Plan, but would still present opportunities for reducing G.H.G. emissions, and thereby result in a positive impact on the environment.