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REPORT

REPORT TO: Mayor Bonnette and Members of Council

REPORT FROM: Damian Szybalski, Corporate Planning Project Lead and Manager of Sustainability

DATE: March 4, 2015

REPORT NO.: PDS-2015-0008

RE: Mayor's Community Energy Plan (Project Update #7)
Draft Local Action Plan (updated)
File No. D27-CO

RECOMMENDATION:

THAT Report No. PDS-2015-0008 (dated March 4, 2015) regarding the updated draft Local Action Plan component of the broader Mayor's Community Energy Plan, be received;

AND FURTHER THAT the updated draft Local Action Plan, dated March 2015 and attached under separate cover to Report No. PDS-2015-0008, including the associated greenhouse gas emission reduction targets of "Scenario 2" contained therein, be approved;

AND FURTHER THAT the updated draft Local Action Plan be posted on the Town's website;

AND FURTHER THAT Town staff report to Council with the final consolidated Mayor's Community Energy Plan.

PURPOSE OF REPORT:

The purpose of this report is to provide an overview of the draft Local Action Plan component of the broader Mayor's Community Energy Plan.

For ease of reading, this report is organized into sections which explain the: (i) context behind the Local Action Plan; (ii) content of the Local Action Plan, including updates

made since the Plan was last considered by Council; (iii) the computer model which underpins the Plan; (iv) the three scenarios that were generated; and (iv) the recommended actions to reduce community greenhouse gas emissions and energy use.

This report builds on Report No. PDS-2014-0041 (dated August 22, 2014) which provided Council with an overview of the draft Local Action Plan. The latter report was deferred.

BACKGROUND:

As detailed in Report No. PDS-2014-0041, the Local Action Plan, hereafter referred to as the "LAP", is one of two key components which will make up the broader Mayor's Community Energy Plan.

As a long-time member of the Federation of Canadian Municipalities' Partners for Climate Protection program[1], the Town's LAP delivers on the program's first three milestones, specifically:

- Creation of a community-wide greenhouse gas emissions inventory;
- Setting of a greenhouse gas emissions reduction target; and
- Development of a Local Action Plan (LAP) which outlines actions that can be taken towards achieving the selected greenhouse gas reduction target.

The remaining two milestones of the Partners for Climate Protection program pertain to the implementation of the LAP, and the monitoring of its implementation and reporting results. The LAP positions Halton Hills to be able to achieve the remaining two milestones.

The second component of the Mayor's Community Energy Plan is the Corporate Energy Plan which is focused on the efficiency of the Town's own facilities. The latter has already been approved by Council. Town staff have provided prior updates on this project via:

- PDS-2014-0041: http://haltonhills.ca/calendars/2014/PDS-2014-0041.pdf
- PDS-2014-0037: http://haltonhills.ca/calendars/2014/PDS-2014-0037.pdf
- PDS-2014-0021: http://haltonhills.ca/calendars/2014/PDS-2014-0021.pdf
- PDS-2014-0005: http://haltonhills.ca/calendars/2014/PDS-2014-0005.pdf
- PDS-2013-0053: http://haltonhills.ca/calendars/2013/PDS-2013-0053.pdf
- PDS-2013-0045: http://haltonhills.ca/calendars/2013/PDS-2013-0045.pdf

[1] The Town of Halton Hills is one of about 270 Canadian municipalities that have joined the Partners for Climate Protection program, committing to taking actions to reduce greenhouse gas emissions from corporate and community activities. In proximity to Halton Hills, Caledon, Oakville, Burlington, Halton Region, Guelph and Mississauga are also members (among others).

COMMENTS:

1. Updates

Council considered Report No. PDS-2014-0041 regarding the draft LAP at its September 8, 2014 meeting. That report was deferred.

Following the deferral, the LAP and the approach to its implementation have been refined. Key refinements include:

- Master Plan: The LAP is being positioned as a Master Plan for the effective management of energy use and greenhouse gas emissions across Halton Hills. Due to the scope and complexity of the LAP, Town staff is not requesting Council's explicit approval of each of the implementing actions at this time. Instead, actions that require additional resources that have not already been budgeted will be brought forward for Council's consideration.

- Performance Measures: Recognizing that what is not measured is not managed, as appropriate, performance measures will be developed for each of the recommended actions. These measures will then be reported to Council on a regular basis so that progress can be tracked.

- Transportation: Achieving efficient use of energy and reaching the Town's greenhouse gas emission targets will require a significant shift in existing commuting patterns. This is because, at 46%, vehicle gasoline accounts for the largest share of energy use in Halton Hills. Private transportation is also the largest source of greenhouse gas emissions in Halton Hills – at 41%.

  Improvements to transportation options are implicit/included in the LAP. Town staff acknowledge that, as appropriate, opportunities for enhancing access to public transit will be explored through the update of the Town's Transportation Master Plan which is scheduled for 2016. A more detailed analysis of transportation options at this time is beyond the scope of the Mayor's Community Energy Plan.

- Implementation: In light of available resources and budget implications, the timelines for the implementation of the recommendations of the LAP have been adjusted so that they can be phased in over a longer period of time. Should additional resources become available earlier, implementation will be moved forward.

  Table 16 of the LAP (provided under separate cover) outlines recommendations that should be taken in the near term to start Halton Hills on a path to reaching its targets. These actions alone will not reach the proposed targets. In addition, the wording of some recommendations has been clarified. The updated implementation schedule spreads out implementation between 2015 and 2019.

- District Energy: As detailed later in this report, the introduction of a district energy system can potentially make a significant contribution to decreasing the community's greenhouse gas emissions. Based on additional stakeholder feedback, Town staff recommend that the feasibility of district energy be investigated while ensuring that the main objective is to reduce overall energy consumption and greenhouse gas emissions, and increase Halton Hills' resiliency[2] – regardless of the type of energy system(s) that is ultimately used. That is, the end goal is not necessarily district energy, but energy efficiency and lower greenhouse gas emissions. This approach has been confirmed with the Vision Georgetown energy consultants.

2. Energy and Climate Change. Role of Municipalities.

North American municipalities are increasingly focused on energy as a strategic priority to reduce operating costs, support economic development, mitigate rising utility costs, and to demonstrate their commitment to long-term sustainability. To complement this, a growing number of municipalities are taking steps to reduce community-wide energy use with the objective of reducing greenhouse gas emissions and addressing climate change. Across Canada, about 50% of the Canadian population lives in a municipality with a community energy Plan.[3]

Caused by rising global carbon dioxide emissions generated by human activity, climate change is projected to result in more frequent and more severe extreme weather conditions (e.g. 2013 ice storm), including heavy precipitation, flooding and heat waves. In turn, these events are anticipated to have significant economic and social impacts on communities, including on municipal infrastructure. A report by the Town's Environmental Advisory Committee highlighted the subject of climate change.

A June 2012 report prepared for the Insurance Bureau of Canada by the Institute for Catastrophic Loss Reduction, estimated the financial impacts (i.e. insured losses) caused by severe weather to have ranged from $10 to $50 billion globally each year over the past decade. In 2011, these costs reached $100 billion. In Canada alone, between 2009 and 2011, losses reached about $3.6 billion.[4]

[2] In the context of a community, resiliency is a term used to describe the ability of a community to withstand a 'stress' and continue to function properly. Examples of stresses include climate change and severe weather (e.g. ice storms, flooding, earthquakes, wind damage, etc). Resiliency also implies prevention and managing risks anticipated to be caused by such stresses through appropriate community design and infrastructure development. (Anna Hercz, City of Ottawa, February 9, 2012)

[3] Community Energy Planning – Getting to Implementation in Canada: http://gettingtoimplementation.ca

[4] Telling the Weather Story. June 2012. Institute for Catastrophic Loss Reduction. Prepared for the Insurance Bureau of Canada. Accessed June 11, 2014. Available at: www.ibc.ca/en/Natural_Disasters/documents/McBean_Report.pdf

Municipalities directly or indirectly control about half of all greenhouse gas emissions in Canada.[5] As a member of the Partners for Climate Protection program, the Town of Halton Hills is taking proactive and meaningful steps to address climate change.

Local governments are strategically positioned to make a significant contribution to addressing climate change, and reducing energy use and greenhouse gas emissions. This is because local governments have the ability to work closely with community stakeholders, and to act quickly to implement effective measures.

In February 2015, the Ontario Ministry of the Environment and Climate Change released "Ontario's Climate Change Discussion Paper 2015". This document outlines considerations that will shape the development of a long-term climate change strategy for Ontario. Among others, the objectives presented in the Discussion Paper include:

- Transitioning to a low-carbon economy that uses less fossil fuel;
- Implementing a price on carbon emissions to motivate reductions in greenhouse gas emissions;
- Designing carbon-neutral communities that are walkable, complete and healthy;
- Retrofitting existing buildings and infrastructure to be more efficient, and building new infrastructure that supports energy efficiency and cleaner fuels (e.g. district energy);
- Aligning provincial infrastructure investment and asset planning decisions with climate change objectives; and
- Elevating the efficiency of the transportation system and decreasing vehicle use.

The Discussion Paper's objectives align well with the objectives of the LAP. Through the LAP's implementation, the Town should be well positioned to make a meaningful contribution to addressing climate change.

3. Local Action Plan (LAP) - community-wide focus

3.1 LAP Objectives

Compared to the Corporate Energy Plan, the LAP is broader in scope as it applies to the municipal boundaries of Halton Hills (i.e. the entire community) rather than being limited to the Town's own corporate operations.

3.2 LAP Content

The LAP is comprehensive and data-intensive. It contains a large volume of valuable data which has been illustrated in a series of tables, graphs and figures. Key sections of the LAP are:

[5] Act Locally: The Municipal Role in Fighting Climate Change. EnviroEconomics. Prepared for the Federation of Canadian Municipalities. December 8, 2009. Accessed August 25, 2014. Available at: www.fcm.ca/Documents/reports/Act_Locally_The_Municipal_Role_in_Fighting_Climate_Change_EN.pdf

- Executive Summary: Provides a brief overview of the LAP, including results for the baseline year of 2011 in terms of energy use and greenhouse gas emissions. The outcomes of three scenarios modelled to the year 2031 are summarized.

- Context: Highlights the international, national, provincial and local context. A key point noted here is that rising global carbon dioxide emissions and the associated rise in temperatures are projected to cause climate change which will lead to more frequent and more severe extreme weather conditions.

- Town of Halton Hills: Summary of relevant Halton Hills policies and plans, including the Strategic Plan and the Community Sustainability Strategy.

- Mayor's Community Energy Plan: Outline of the project's scope, objectives and methods used.

- Community Engagement: Summary of a variety of community engagement strategies and their results.

- Modeling: Description of the GHGProof computer model which was used to generate the scenarios for the LAP, as well as the importance of land-use planning as a dominant driver of community energy use and greenhouse gas emissions. Includes data for the 2011 baseline year.

- Modelled Scenarios: Details of the three scenarios prepared for the LAP, and the resulting greenhouse gas emissions, energy consumption, transportation mode share and economic impacts.

- Discussion Items: Among other matters, highlights of the Social Cost of Carbon. This is an approach to monetarily quantify the economic damages caused by climate change.

- Corporate Energy Plan: Overview of the corporate component of the LAP. This section complements the recommendations of the Corporate Energy Plan.

- Recommendations: Presentation of 16 recommended actions that should be undertaken to work towards achieving the recommended greenhouse gas emission targets for Halton Hills.

- Conclusion: Concludes the LAP by underscoring that Halton Hills already has many of the ingredients necessary to move towards being a low carbon community – a community characterized by lower energy use and greenhouse gas emissions.

- Appendix 1: Review of best practices. Although not necessarily fully transferable to the Halton Hills context, the best practices provide context and inspiration.

- Appendix 2: Provides an overview of the data, methods and assumptions that were used to develop and 'run' the GHGProof computer model. This includes a description of how the scenarios were developed and the uncertainty involved.

- Appendix 3: Summary of one of the community engagement sessions, focusing on the mapping of Halton Hills' green economy, and identifying opportunities for energy and greenhouse gas emission reductions.

- Appendix 4: Questions used to provide input into the modelled scenarios.

- Appendix 5: Overview of the concept of the Social Cost of Carbon.

3.3 Computer Modeling (GHGProof)

A unique aspect of the Halton Hills LAP is that it is based on a detailed computer model, referred to as 'GHGProof'. This computer model was used to analyze land-use patterns and transportation scenarios to evaluate their impact on energy and greenhouse gas emissions, as well as cost savings and economic benefits. Although the model does not predict outcomes with certainty, it does illustrate the effects of different scenarios.

Figure 1 illustrates the key areas considered by the model, including transportation, buildings, waste, agriculture and forests.

Figure 1: Issues Addressed by the GHGProof Model

3.4 Overview of Modelled Scenarios

To develop greenhouse gas emission reduction targets, the computer model is based on three scenarios:

- Scenario 1: Moderate Energy Efficiency
- Scenario 2: Towards a Low Carbon Community
- Scenario 3: Low Carbon Community

The scenarios represent different land-use patterns, levels of building efficiency, transportation mode share, fuel mileage efficiency, and local agricultural food production – among other factors. Each model builds on 2011 as a baseline year and forecasts to 2031. Appendix 1 to this report provides a summary of each scenario.

Because population is a key driver in the model the scenarios should only be compared on a per capita basis rather than on total energy and greenhouse gas emission results.

It is critical to underscore that the purpose of the scenarios was to explore the impacts of 'pulling different levers' or to explore 'what ifs' in terms of community energy use and greenhouse gas emissions, rather than to define exactly what will happen in 2031. The assumptions underlying the scenarios are not intended to be interpreted as the conditions that will necessarily materialize by 2031. Because of the large number of inputs and assumptions, it is acknowledged that the model contains some uncertainty.

Also, because the Town has already taken many proactive steps towards sustainable land-use planning, including the update of its Official Plan, completion of the Intensification Strategy (OPA No. 9), implementation of Green Development Standards and the completion of the Community Sustainability Strategy, in the case of Halton Hills, land-use is not a critical driver underlying the modelled scenarios. The Town's planned land-use patterns are already compact and are anticipated to achieve optimal land-use patterns for the purpose of the modelled scenarios. Aside from land-use, however, there are other key factors at play, including assumptions related to the potential for district energy, modal split, local food production, and the energy efficiency of existing and new development.

3.5 Scenarios and Recommended Greenhouse Gas Reduction Targets

Scenario 3 (Low Carbon Community) is the most ambitious of the three scenarios. Although, among other factors, achieving all three scenarios will require changes in human behaviour (especially related to how we commute) and greater energy efficiency of new development, given the current stage of the Town's evolution as a community, Scenarios 2 and 3 will require the most transformative change. That is, today, Halton Hills is a relatively low-density community, characterized by travel patterns that are dominated by the car. Although meaningful change is starting to take place as new development becomes more efficient, as more intensification occurs, as alternative modes of transportation become more widely used, and as more people realize the

benefits of energy conservation, it will take time and resources over the long-term to achieve significant change. Scenario 1 is the least ambitious.

Recognizing this and in-keeping with the PAREE Principle (Practical, Affordable, Reasonable, Educational and Enforceable), at this time, it is recommended that Scenario 2 (Towards a Low Carbon Community) be the basis for establishing greenhouse gas emission reduction targets for Halton Hills.

Scenario 2 will move Halton Hills towards being a low carbon community. Scenario 2 achieves a 35% reduction in per capita greenhouse gas emissions. Although there is an overall increase in total greenhouse gas emissions over the baseline year (2011), Scenario 2 does achieve a 14% decrease in total emissions compared to Scenario 1.

Basing the targets on Scenario 2 will allow the Town the time needed to start implementing the Plan's recommendations and to assess progress. The outcomes of the recommended district energy feasibility study (completed as part of the energy conservation assessment for Vision Georgetown) will be particularly important as all the scenarios, but especially Scenarios 2 and 3, are premised on Halton Hills having a district energy system in place by 2031. Once the results of the study are known and the Plan's implementation is underway, the model can be revisited and adjusted as appropriate. It is recommended that this be done every two years. A comprehensive review of the LAP would be completed every five years, and take into account development trends and technological improvements.

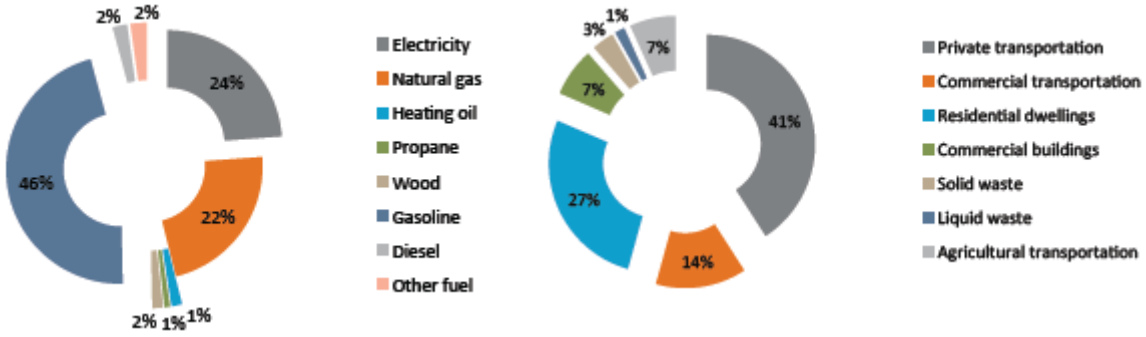
3.6 Result Highlights

The computer model generated a large number of detailed outputs. Some of the key results are highlighted below.

3.6.1 Baseline (2011)

Side by side, Figure 2 shows the community's energy consumption by fuel type and greenhouse gas emissions by source. Shown on the left, the main source of energy in Halton Hills is gasoline at 46%, more than electricity (24%) and natural gas (22%). On the right, the main source of community greenhouse gas emissions is private transportation (41%). Emissions from residential dwellings account for 27% of the emissions, with commercial transportation accounting for 14%.

Figure 2: Halton Hills Energy Consumption and Greenhouse Gas Emissions



Using GIS mapping and utility data, the model generated valuable “heat maps” of electricity and natural gas consumption in Halton Hills (Figures 3 and 4). These maps illustrate where energy is being used and the intensity at which it is being used relative to other areas. The ‘warmer’ the colour on the map, the more significant the energy consumption. The ‘cooler’ the colour, the less energy consumption there is in that area.

Results of the GIS analysis provide a basis for targeting energy conservation programs in specific areas of the Town. Figure 3 shows electricity consumption in baseline year of 2011. Figure 4 shows the natural gas consumption in 2011.

In Georgetown, electricity consumption is generally concentrated along the commercial Guelph Street corridor, in a pocket south of Argyll Road in Georgetown South, in a pocket on Armstrong Avenue, and in the downtown area. In Acton, electricity consumption is concentrated in parts of the downtown. A direct comparison between the electricity and natural gas data is not possible as the data have been provided at different resolutions.

In terms of natural gas use across the Town, the highest concentration is visible west of Ninth Line and north of Argyll Road in Georgetown South.

Figure 3: Electricity Consumption (kWh/hectare/year)

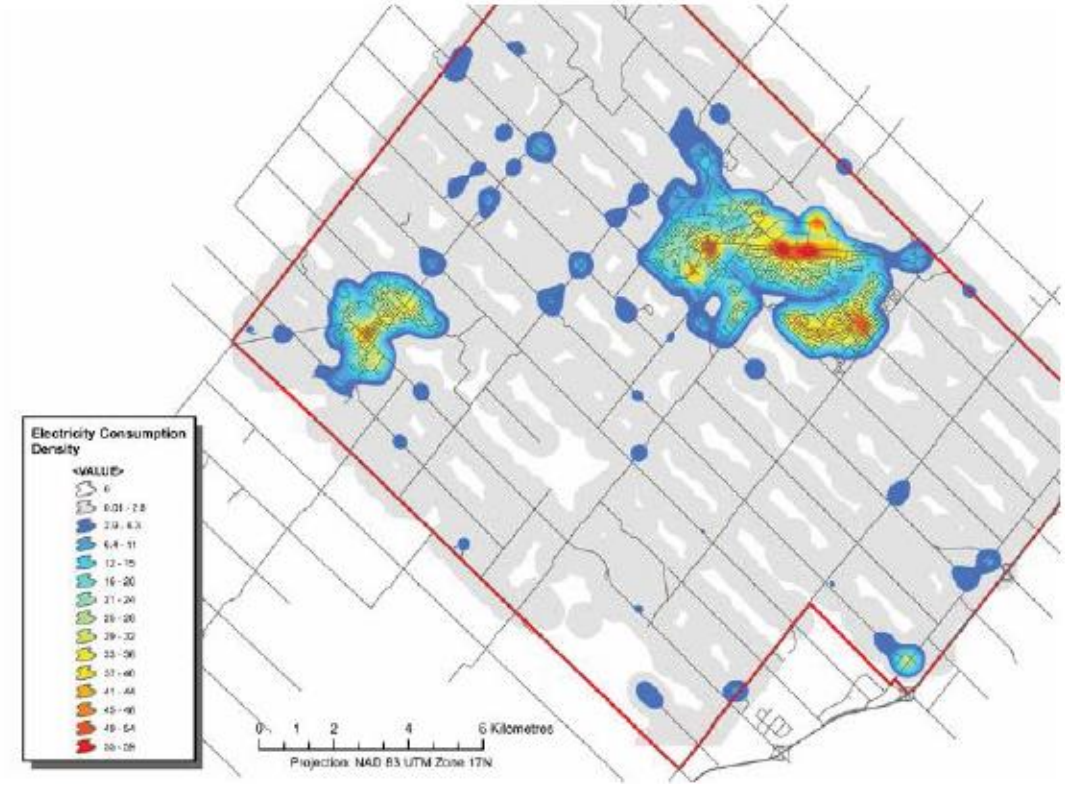
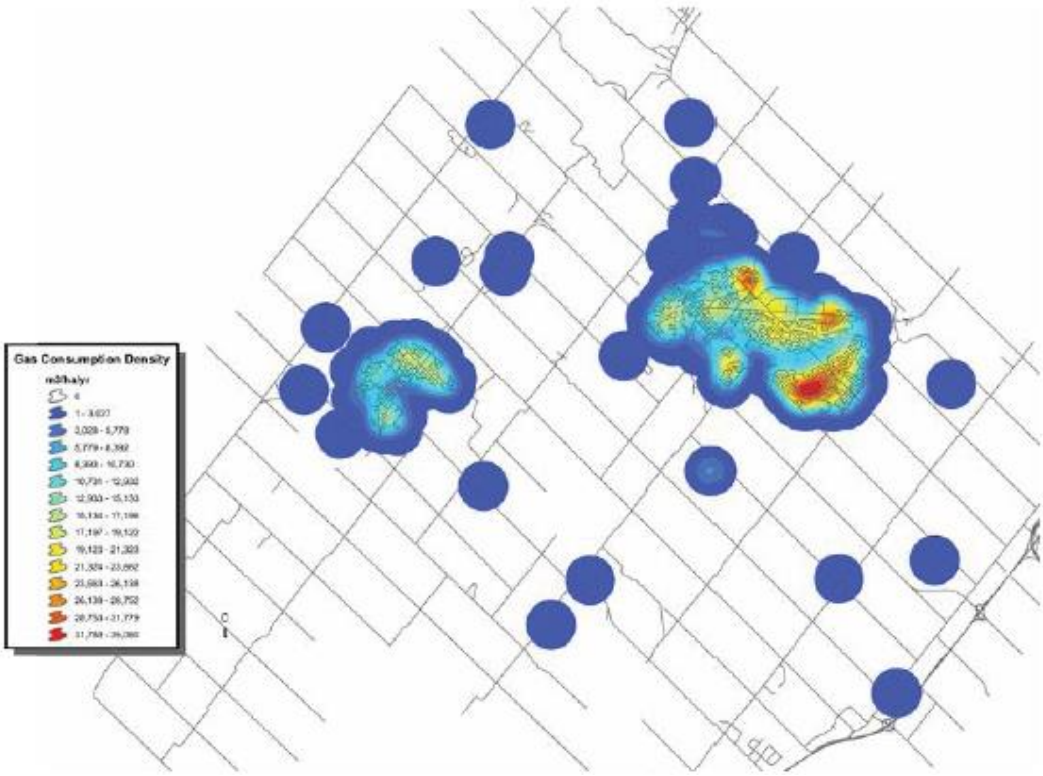


Figure 4: Natural Gas Consumption (m^3/hectare/year)



3.6.2 Future Scenarios (2031 compared to 2011 baseline)

Detailed results for each of the three future scenarios are included in the body of the LAP. The results demonstrate an important relationship between population growth and greenhouse gas emissions. As population grows, achieving reductions in total emissions is difficult. Achieving per capita reductions is more achievable.

In terms of greenhouse gas emissions, Figure 5 shows the estimated total and per capita greenhouse gas emissions for each scenario.

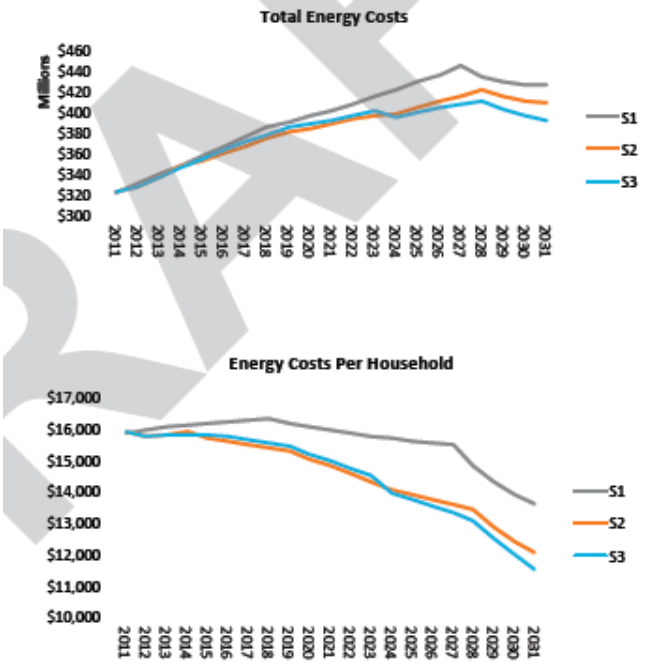
Total greenhouse gas emissions will continue to climb in Scenarios 1 and 2. Under Scenario 3, a 12% reduction in total emissions will be achieved. Compared to Scenario 1, Scenario 2 is modelled to achieve a 14% decrease in emissions. Significant per capita greenhouse gas reductions will be achieved across all scenarios. Per capita emissions decline by 35% under Scenario 2.

Figure 5: Total and Per Capita Greenhouse Gas Emissions – All Scenarios

	Total (tCO2e)			Per capita Total (tCO2e)		
Scenario	Baseline (2011)	2031	% change	Baseline (2011)	2031	% change
1	618,465	720,291	+17%	10.5	8.3	-21%
2	618,465	638,353	+3%	10.5	6.8	-35%
3	618,465	542,430	-12%	10.5	5.8	-45%

Figure 6 shows the estimated total (top graph) and household (bottom graph) energy costs projected for each of the three scenarios.

Figure 6: Total and Household Energy Costs – All Scenarios

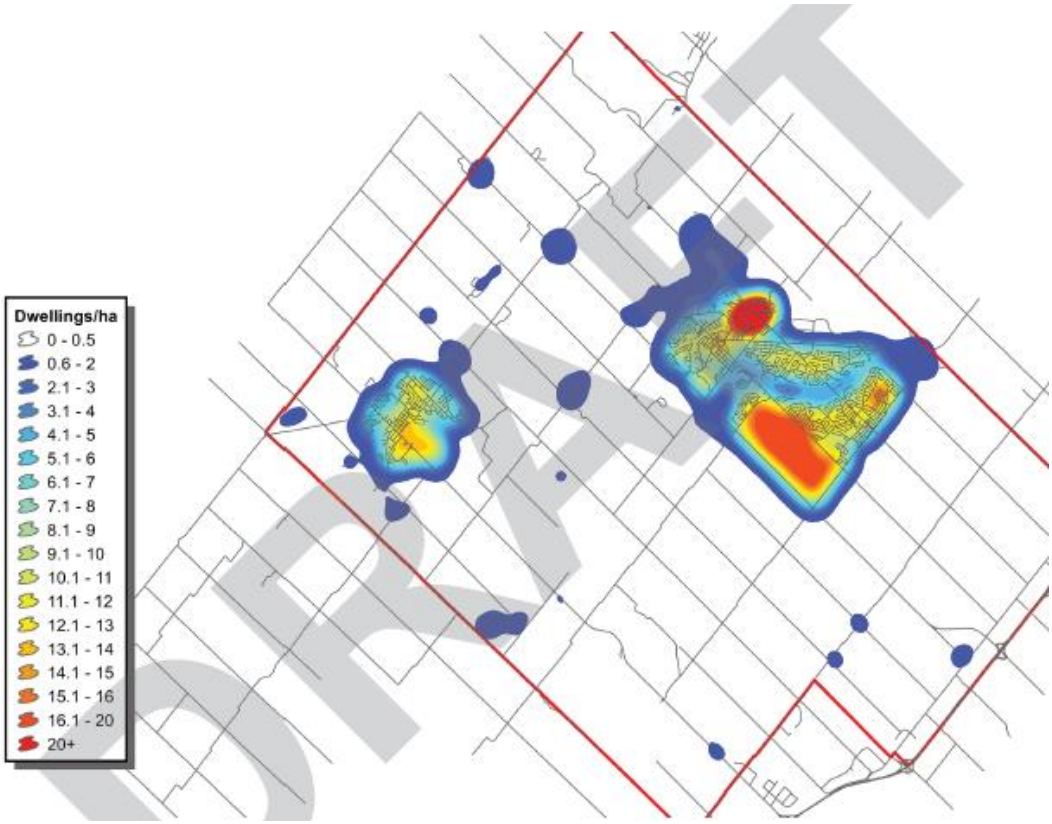


In terms of total community energy costs, under Scenario 1, energy costs reach $426 million by 2031, an increase of about $105 million over the 2011 baseline. This compares to an increase of $88 million under Scenario 2 and $70 million under Scenario 3. Annual household energy costs decrease from the 2011 baseline ($15,846) to $12,037 under Scenario 2. Overall, as the level of ambition with respect to energy conservation increases, the incremental rise in community energy costs is decreased.

Figure 7 illustrates the housing density achieved under Scenarios 2 and 3, by 2031. A similar map is included in the LAP for Scenario 1.

The highest dwelling densities (number of dwellings per hectare) are generally anticipated in the 1000 acres subject to the Vision Georgetown Secondary Plan exercise, and east and west of Mountainview Road in proximity to the Georgetown GO Station, subject to the approved GO Station Area/Mill Street Corridor Secondary Plan.

Figure 7: Housing Density in 2031 – Scenarios 2 and 3



4.0 Additional Result Highlights

In addition to the information already presented above, LAP highlights include:

- Halton Hills already has the many key ingredients needed to move towards a low carbon future, characterized by a community that uses less energy and generates less greenhouse gas emissions. This includes:
    - Established downtowns of Acton and Georgetown;
    - Extensive greenspace to offset greenhouse gas emissions and limit sprawl;
    - Strong policy framework to support intensification;
    - Vision Georgetown lands which offer an opportunity to plan a community that reduces energy use and greenhouse gas emissions. In fact, at a Vision Georgetown Community Visioning Workshop held on November 2, 2013, among other matters, more than 80% of the participants felt that it is either very important or somewhat important that conservation and energy efficiency be encouraged in the new community;
    - Strong relationship with Halton Hills Community Energy Corporation/Halton Hills Hydro; and
    - Numerous existing initiatives focused on energy efficiency and greenhouse gas emission reductions.

- Investing in lower energy use and greenhouse gas emissions across Halton Hills is projected to have significant economic benefits, including:

    - About $17 million in gross annual community energy cost reductions under Scenario 2 in 2031, compared to Scenario 1, for total energy cost savings of $271 million between 2011 and 2031. At the household level, annual energy costs decrease by $1,550 under Scenario 2 compared to Scenario 1, or $3,809 compared to 2011.

    - Investments in energy and greenhouse gas emission reductions are estimated to translate into about 218 additional jobs under Scenario 2.

    - Greenhouse gas emissions contribute to climate change. In turn, climate change is associated with a wide range of negative impacts, including flooding, droughts, extreme weather, human health costs and loss of habitat.

      One way of estimating or monetizing the costs of these damages is to estimate the "Social Cost of Carbon". The Social Cost of Carbon assigns a value to the damages caused by climate change anywhere in the world (including in Halton Hills) due to emissions produced in Halton Hills. Due to the uncertainty of the estimates of the costs and other factors, estimates of annual damages caused by carbon dioxide emissions originating in Halton Hills range from about $3 million to $74 million.

    - Every kilowatt-hour (kWh) of electricity saved in Halton Hills represents greater savings than that one kWh in the context of the broader energy system. This is because every kWh of electricity used by the end customer requires more than one kWh to be generated in order to account for efficiency losses between the electricity being generated and used.

5.0 Recommendations

At the community-wide level, to achieve efficiencies, the LAP recommends that the following targets be adopted by the Town:

- 35% reduction in per capita greenhouse gas emissions by 2031 – compared to 2011 levels; and

- 14% reduction in total greenhouse gas emissions by 2031 – compared to emissions modelled for Scenario 1 (Moderate Energy Efficiency).

Table 16 of the LAP outlines actions recommended to be pursued in order to work towards achieving the aforementioned targets. Doing so is projected to generate about $271 million in energy savings. To achieve this, an initial investment is needed of about $720,000 (excluding staff time) in terms of recommended actions between 2015 and

2019. However, a portion of these costs is intended to be offset by: (i) external funding, including from the Federation of Canadian Municipalities; (ii) structuring some of the initiatives to use self-replenishing funds (e.g. revolving energy fund); (iii) relying on other project budgets, specifically the Vision Georgetown project which will deliver the district energy feasibility study; and (iv) by leveraging planned existing capital projects such the update of the Town's Green Development Standards. This approach is expected to significantly reduce the required net investment.

The recommended actions are based on several inputs, including existing initiatives, stakeholder and community feedback, best practices, and professional judgment by the consulting team. Successful implementation of the recommendations will require collaboration with internal and external stakeholders, as well as the leveraging of existing Town and community initiatives and policies.

The LAP recommendations will also be subject to additional review by Town staff and discussions with potential partners/stakeholders. Recommended actions include:

- Continue to promote intensification: Continue to focus on intensification by increasing the number of dwellings located within 500 metres of commercial cores, and implementing the Town's intensification policies.

- Continue to encourage mixed-use development: Continue to focus on promoting mixed-use developments and complete communities. These developments encourage active transportation, reduce the vehicular mode share, are more energy efficient, and generate fewer greenhouse gas emissions. Work towards decreasing the share of total trips taken by vehicles from 84% to 71%.

- Energy Retrofits: Develop a program for Property Assessed Payments for Energy Retrofits (PAPER). This could be a way for the Town to encourage energy retrofits in the community through the provision of secure, low-interest financing that is repaid on the property tax bill of participating landowners. Focus should be on increasing the energy efficiency of new dwellings as well as retrofitting 5% of the existing building stock each year.

- Revolving Loan Fund: Implement a revolving loan fund mechanism for financing energy efficiency projects using the savings from energy conservation projects.

- Incentives: Encourage the uptake of existing energy efficiency incentives as a way of increasing the efficiency of new and existing buildings. Develop a community engagement strategy to facilitate increased awareness and uptake of available incentives.

- Green Development Standards: Enhance the Green Development Standards by expanding them to address the efficiency of major renovations and the retrofit of the existing building stock. Consider the use of the 'Passive House' standard for the Vision Georgetown lands. According to the Canadian Passive House Institute, a Passive House involves construction techniques that achieve 80% to

90% energy savings compared to conventional construction. Among other things, this is achieved by minimizing surface area to reduce heat loss, maximizing heating by natural sunlight, substantial insulation improvements and advanced windows.

- District Energy: Complete a feasibility study for district energy as part of the Vision Georgetown project. Engage Halton Hills Community Energy Corporation, Union Gas, landowners, school boards and other appropriate stakeholders to include district energy criteria as part of the Vision Georgetown Secondary Plan exercise to determine if district energy is feasible for all or part of the urban expansion area. Town staff recommend that the end goal of this study be increased energy conservation, reduced greenhouse gas emissions and community resiliency – regardless of the specific technology chosen.

  Among other matters, a more in-depth district energy feasibility study may address:

  - Baseline Data (e.g. practical examples of district energy systems implemented in a context similar to Halton Hills, current and projected energy loads; utility costs; availability and proximity to energy anchors);

  - Development Densities and Land-use Mix (e.g. establish a build-out scenario which will be accomplished through the Vision Georgetown concepts; which buildings to connect and when; development phasing, and scheduling of how the system will grow over time);

  - System Boundaries (e.g. identify the boundaries, size and configuration of a district energy system, including location(s) for a possible district energy plant and pipe distribution network);

  - Availability of Suitable Energy Sources (e.g. wood waste, solid waste, solar energy, waste heat, geothermal; energy costs; building/customer proximity to energy sources);

  - Technology (e.g. type of technology that may be used to power the district energy system; its availability and costs);

  - Ownership Structure (e.g. Town ownership vs private utility vs Public Private Partnership; and the financial, legal and political implications of each ownership model);

  - Type of District Energy System (e.g. will the system be for heating, cooling or both);

  - ‘District Energy Ready Development’ (e.g. requirements for development to be ‘District Energy Ready’ so that new and existing projects are compatible and easily connectable to a district energy system);

- Implementation (e.g. a detailed implementation plan, including financing mechanisms, marketing plan, timelines and recommended ownership structure);

- Policy Framework (e.g. Town, Regional, Provincial and national policies to encourage and support district energy; mechanisms for ensuring connections to district energy; review of applicable regulatory considerations);

- Engineering Considerations (e.g. recommended piping distribution system size and layout; assessment of the energy characteristics of potential buildings that will be connected to the system);

- Financing Options (e.g. who will finance the system and how; availability of grants and loans);

- Business Case (e.g. cost-benefit analysis, projected capital costs, revenues and expenses; greenhouse gas emission reductions; customer pricing; timing of connections of customers and main anchors, lower and more stable utility costs);

- Risk Assessment (e.g. consideration of possible risks associated with financing, likelihood of customers connecting to the system, energy cost fluctuations and changing economic conditions); and

- Consultation (e.g. consultation with technical experts and key stakeholders, including Halton Hills Community Energy Corporation, Union Gas, landowners, school boards, and possible energy suppliers and customers).

Regarding the feasibility of district energy, it is important to emphasize that while the LAP suggests that district energy may potentially be feasible, this conclusion is based on a wide range of assumptions. Consequently, the viability of a district energy system in all or part of the Vision Georgetown lands requires a much more detailed assessment which takes into account specific variables, as listed above. Recognizing this, the undertaking of a district energy feasibility study is one of the recommendations of the LAP (see Table 16 of the LAP).

Acknowledging the benefits of energy conservation and the fact that low carbon solutions are a critical part of developing sustainable communities, Phase 3 of the Vision Georgetown project includes the preparation of an Energy Conservation Assessments/Strategy. This Strategy is being closely coordinated with the outcomes of the Mayor's Community Energy Plan.

Based on discussions with the Vision Georgetown consultants, the scope of the feasibility study recommended by the Mayor's Community Energy Plan is somewhat broader than that originally budgeted as part of the Vision

Georgetown project. The additional cost of completing an in-depth district energy feasibility study will be approximately $23,000. Based on discussions with Halton Hills Community Energy Corporation, this additional cost will be covered by Halton Hills Community Energy Corporation.

Appendix 2 to this report provides a brief overview of district energy.

- Transportation: Recognizing that transportation and associated fuel use are major energy users and greenhouse gas generators (respectively), the LAP makes several transportation-related recommendations, including:

    - Active Transportation: Support active transportation. Implement the Cycling Master Plan. Prioritize walking and cycling over vehicle travel in the Vision Georgetown lands. Decrease the share of all trips being taken by car from 84% to 71%.

    - GO Transit: Increase GO Transit service. Increase densities within 500 metres of hourly GO Transit service.

    - Linkages: Explore additional public transportation linkages within Halton Hills and to other communities.

    - Public Transit: Improved access to public transit by year 2031 is implicit/included in Scenario 2. As appropriate, opportunities for enhancing access to public transit will be explored through the upcoming update of the Town's Transportation Master Plan in 2016. The Town will continue to advocate to Metrolinx for two-way all day GO Transit service to meet its modal split objectives. A more detailed analysis of public transportation options at this time is beyond the scope of the Mayor's Community Energy Plan.

    - Smart Commute: As appropriate, in collaboration with Smart Commute Halton and other stakeholders: deliver custom school and workplace travel plans; offer bicycle training programs; establish car sharing programs; engage employers in transportation planning; and offer personalized transportation planning to individual and households.

- Walking: In collaboration with the school boards, expand options to walk to school. Walking to school reduces vehicle traffic and can reduce the vehicle mode share.

- Local Food: Local food production and consumption reduces greenhouse gas emissions. Continue to support local farmers' markets. Develop a Halton Hills Food Security Plan. Introduce a local food procurement policy, and explore opportunities to engage a new generation of farmers.

- Green Economic Development Strategy: Develop an energy hub for energy conservation and renewable energy businesses to facilitate collaboration and learning opportunities.

- Forests: Protect and enhance forested areas. Complete an analysis of the carbon storage capacity of forested areas as these areas absorb greenhouse gas emissions.

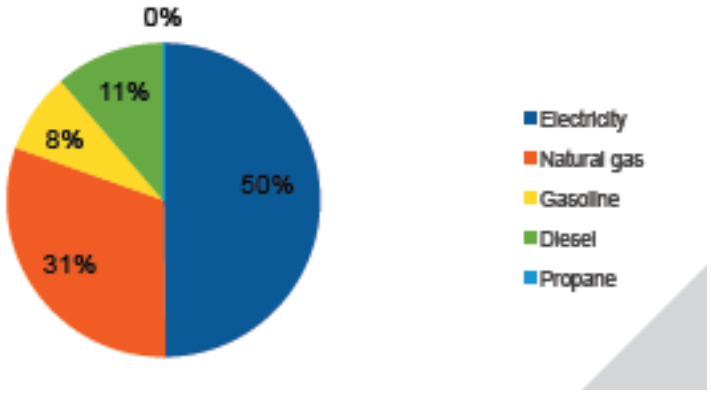
- Monitoring and Update: Monitor progress towards achieving targets, and update the greenhouse gas inventory and GHGProof computer model bi-annually. Update the LAP every five years. Report on progress annually.

6.0 Corporate Targets

The Partners for Climate Protection milestones also require the consideration of the Town's corporate operations. Although these operations were detailed in the Corporate Energy Plan, the Local Action Plan supplements the Corporate Energy Plan by expending the scope to include the Town's vehicle fleet, streetlights and solid waste[6].

For 2011, the baseline year, total energy consumption by the Town's operations is estimated at nearly 72,000 gigajoules[7] at a cost estimated to be about $1.9 million, generating nearly 3,200 tonnes of greenhouse gas emissions. Figure 8 shows the Town's 2011 corporate energy consumption by fuel type.

Figure 8: Energy Consumption by Fuel Type (2011) – Town Corporate



The Gellert Community Centre, Mold-Masters SportsPlex and the Acton Arena are the major energy loads in the Town's building portfolio. The same three facilities generate the highest greenhouse gas emissions, and have the highest energy cost.

[6] Consideration of solid waste is limited to the amount of solid waste generated by Town staff (on average).

[7] According to the Alberta Ministry of Energy: "One gigajoule is one billion joules. The amount of natural gas consumed each year in a typical Canadian home is equivalent to 120 gigajoules…The amount of energy represented by one gigajoule is equivalent to about 30 litres of gasoline, 39 litres of propane, 278 kilowatt-hours of electricity or 45.5 kilograms of coal." Source: www.energy.alberta.ca/about_us/1132.asp

The targets presented by the LAP for the Town's corporate operations build on the targets outlined in the Corporate Energy Plan by adding a possible 30% reduction in energy consumption from the conversion of streetlights to LED technology. As a result, the overall corporate greenhouse reduction target recommended to be achieved by 2019 via the LAP is 20%.

In addition to implementing the recommendations of the Corporate Energy Plan, in order to achieve the 20% greenhouse gas emissions reduction recommended by the LAP, the following actions are recommended:

- Converting streetlights to LEDs;
- Purchase electric and/or hybrid vehicles where small cars are suitable;
- Purchase electric vans;
- Offer fleet management courses to improve fuel efficiency; and
- Identify opportunities to reduce fleet vehicle use to deliver services.

Achieving a 20% reduction in the Town's corporate greenhouse gas emissions by 2019 is estimated to generate between $300,000 and $360,000 in annual energy cost savings by 2019.

7.0 Stakeholder and Community Engagement

As with the Corporate Energy Plan, the LAP incorporated stakeholder input. This was achieved through a variety of channels, including workshops, interviews, employee engagement opportunities, online crowdsourcing, surveys, stakeholder presentations, meetings of the Steering and Technical project committees, and outreach at several community events, including:

- Georgetown Farmers' Market
- Acton Farmers' Market
- Acton Fall Fair
- Halton Forest Festival
- Presentations to:
    - Halton Hills Chamber of Commerce
    - Georgetown BIA
    - Town Environmental Advisory Committee
    - Mayor's Youth Action Committee
    - Halton Hills Hydro Board of Directors
    - Youth Summer Camps

The full scope of community engagement is detailed in the LAP.

8.0 Next Steps

To complete the Mayor's Community Energy Plan, the draft LAP will be updated based on any additional feedback received. The final LAP will then be consolidated with the Corporate Energy Plan into one seamless Plan – the Mayor's Community Energy Plan.

RELATIONSHIP TO STRATEGIC PLAN:

Sustainability is one of ten Council priorities identified in the Town's Strategic Action Plan, and repeatedly referenced throughout the Strategic Plan's Strategic Objectives and Strategic Actions. Therefore, the completion of the Mayor's Community Energy Plan will better enable the Town to fulfill its many sustainability objectives, including those directly related to energy. In particular, Strategic Action B.5.(h) which reads: "Develop a Community Energy Plan, in cooperation with Halton Hills Community Energy Corporation."

FINANCIAL IMPACT:

Implementation of the LAP is anticipated to result in significant economic benefits for the broader Halton Hills community, as well as the Town's corporate operations. For example, at the community level, annual energy costs are modelled to be reduced by $17 million ($271 in total). There is also the benefit of about 218 new jobs being generated under Scenario 2, and the potential to reduce the costs associated with damage caused by climate change.

At the corporate level, achieving a 20% reduction in greenhouse gas emissions, is projected to result in up to $360,000 in annual energy cost savings by 2019.

COMMUNICATIONS IMPACT:

The LAP contains a large amount of technical information. Recognizing this, a communication plan and material will be developed.

SUSTAINABILITY IMPLICATIONS:

The Town is committed to implementing our Community Sustainability Strategy, Imagine Halton Hills. Doing so will lead to a higher quality of life. The relationship between this report and the Strategy is summarized below:

Do the report's recommendations advance the Strategy's implementation? Yes

Which pillar(s) of sustainability does this report support?
Economic Prosperity, Environmental Health and Social Well-Being

There is strong alignment between the LAP and the Community Sustainability Strategy, especially the focus areas of:

- Diversified and Resilient Economy
- Knowledge-Based Industry & Research and Innovation

- Energy
- Air Quality and Greenhouse Gas Emissions
- Green Economy
- Infrastructure
- Natural Heritage
- Land Use
- Housing
- Transportation

The LAP and the broader Mayor's Community Energy Plan also relate to numerous Green Plan recommendations, including #25, 26, 31, 39, 43, 44, 48, 60, 66 and 67 which relate to energy and water efficiency, new development practices, energy management, LEED® building design, renewable energy and greenhouse gas emission reductions. There are also synergies with the Town's Strategic Plan, Official Plan, Green Development Standards, Vision Georgetown Secondary Plan process, and the climate change report prepared by the Town Environmental Advisory Committee.

The LAP's recommendations are anticipated to benefit future generations through a focus on efficiency, conservation, renewable energy, greenhouse gas emission reductions, and mitigation of climate change impacts. Successful implementation is anticipated to translate into financial benefits.

Overall, the alignment of this report with the Community Sustainability Strategy is:
Very Good

CONSULTATION:

The project's Steering and Technical committees guided this project. In addition, various modes of community engagement were used for the LAP and the broader Mayor's Community Energy Plan. The Senior Management Team, staff involved in the Vision Georgetown project, and the Manager of Transportation and Development Engineering were also consulted.

CONCLUSION:

This report highlighted one of the two key components that will make up the overall Mayor's Community Energy Plan – the Local Action Plan (LAP).

Building on the Town's past successes and many existing efforts, the LAP is anticipated to materialize in reduced energy use, lower greenhouse gas emissions, retention of energy spending within the local economy, household energy savings, employment, climate change mitigation, and more efficient and healthy communities.

At the community-wide level, the LAP recommends that the following targets be adopted by the Town:

- 35% reduction in per capita greenhouse gas emissions by 2031 – compared to 2011 levels; and
- 14% reduction in total greenhouse gas emissions by 2031 – compared to emissions modelled for Scenario 1 (Moderate Energy Efficiency).

Sustained and comprehensive effort is anticipated to yield significant positive results.

Respectfully submitted,

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David Smith
Chief Administrative Officer

APPENDIX 1 to Report No. PDS-2014-0041
-Summary of Modelled Scenarios-

	2011	2031		
	Baseline	S1: Moderate Energy Efficiency	S2: Towards a Low Carbon Community	S3: Low Carbon Community
Total GHG emissions (tCO2e)	618,465	720,291	638,353	542,430
GHG emissions per capita (tCO2e)	10.5	8.32	6.79	5.8
% change in GHG emissions/capita over baseline	N/A	-21%	-35%	-45%
% change in absolute GHG emissions over baseline	N/A	+17%	+3%	-12%
Energy/capita (GJ)	168	136	120	110
Vehicle kilometres travelled/capita (km)	51,094	42,127	37,365	28,354
Average trip length (km)	22	19.6	20	20
Total dwellings		11,080	13,740	13,740
# of dwellings within 500m of a commercial area	9,200	11,071	12,230	12,230
Transportation improvements		GO station in Georgetown and Acton with increased daily service.	GO station in Georgetown and Acton with increased daily service. Bus service between Georgetown and Acton. (The model is based on a change from infrequent to frequent (at least hourly) service).	GO station in Georgetown and Acton with increased daily service. Access to the Georgetown GO station from South West Georgetown via shuttle bus or similar method. Bus service from Acton to Georgetown and Milton.
Vehicle mode share	84%	82%	71%	54%
Dwellings connected to district energy by 2031	0	502	2,713	2,713
Local food production	5%	20%	20%	20%
Agricultural area	18,390	17,707	17,707	17,707
Total annual community energy costs	$321 million	$426 million	$409 million	$391 million
Annual household energy costs	$15,846	$13,587	$12,037	$11,379
New jobs created	N/A	N/A	218	237
Estimated annual damages resulting from GHG emissions generated in Halton Hills	$3 million - $41 million	$7 million - $74 million	$6 million - $65 million	$5.5 million - $55 million

APPENDIX 2 to Report No. PDS-2014-0041
-Brief Overview of District Energy-

District energy is a system that provides heat and/or cooling to more than one building from a central power plant[8]. Buildings that are connected to district energy do not require their own individual boilers, furnaces, chillers or air conditioners. Instead, energy is transported through a network of underground pipes. District energy is not a new concept, with the first commercial system introduced in 1877. Today, there are about 120 such systems across Canada. District energy advantages can include:

- Efficiency: Improved efficiency since there is no need for buildings to have their own individual heating systems, and achievement of economies of scale through centralization of equipment.

- Cost Savings: Efficiencies characteristic of district energy systems can result in reduced energy costs for customers connected to the system. Upfront capital costs for developers can be reduced by avoiding the need for individual heating and cooling systems for each building. The freed-up space that would otherwise be used for mechanical items, can be used as revenue-generating space.

- Reliability: District energy stems are professionally operated and known to provide more reliable service.

- Maintenance: Compared to the maintenance of multiple individual systems, the maintenance of a single system is more cost-effective.

- Local Economy: By sourcing fuel from local sources instead of importing energy from distant locations, a district energy system can retain spending on energy within the local economy. Local employment can be generated to support the construction, operation and maintenance of a district energy system.

- Flexibility: A district energy system can respond to changes in fuel costs and availability by being converted to the most economical fuel source. For example, a gas driven district energy system could potentially be converted to biomass in response to gas shortages and price volatility.

- Greenhouse Gas Emissions: Lower greenhouse gas emissions, especially when a renewable energy source is used to power a district energy system.

[8] This section is based on information from several sources, including: (i) Kelowna District Energy – Prefeasibility Study, January 2010. City of Kelowna. Community Energy Association; (ii) District Energy System Pre-Feasibility Study, City of Whitehorse, Yukon – A study to assess the viability of establishing a District Energy System in the City of Whitehorse, Yukon. Stantec Consulting Ltd. and Earthvoice Strategies; (iii) Pearson Eco-Business Zone District Energy Feasibility Study for Toronto and Region Conservation Authority. April 10, 2012. FVB Energy Inc.; (iv) District Energy Inventory for Canada, 2013. John Nyboer et al. Canadian Industrial Energy End-use and Analysis Centre. Simon Fraser University. March 2014.