

City Council Information Items



January 10, 2020

Items for information is a weekly publication for the public and members of City Council. Members of City Council may request that any item appearing on this publication be placed onto the next available Committee of the Whole meeting for discussion.

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Information Report



Service Area	Infrastructure, Development and Enterprise Services
Date	Friday, January 10, 2020
Subject	Net Zero Carbon Development: Tools and Opportunities
Report Number	IDE-2020-14

Executive Summary

Purpose of Report

To provide information regarding potential tools and other opportunities for the City to pursue its net zero carbon objectives through the development approvals process.

Key Findings

There are a number of potential tools and opportunities available to municipalities in Ontario that can assist in facilitating net zero carbon development.

Given the City's targets to achieve net zero carbon in the future, this report is focused on opportunities for new building construction, although broader opportunities are also described.

It is noted that there are legislative and regulatory limitations to what municipalities can require through Planning Act approvals.

Financial Implications

There are no immediate financial implications associated with this report. A number of the potential opportunities described in this report could have financial implications, which would need to be further examined, if the City were to pursue implementing such tools.

Report

Council has endorsed the Community Energy Initiative (CEI) Update, which includes a significant work plan and technical actions to achieve the goal of Guelph becoming a Net Zero Carbon community by 2050. To help achieve this goal, a not-for-profit entity called Our Energy Guelph (OEG) has been contracted to act as the City's CEI delivery partner. The City has entered into a Service Agreement with OEG that sets out roles, responsibilities and key deliverables, and defines an ongoing relationship with the City as a key stakeholder (see [Report IDE-2019-80](#)).

Of the 25 actions contained in the CEI Update, two specifically relate to new development:

1. Incrementally increase the number of net zero new homes to 100% by 2030.
2. Incrementally increase the number non-residential buildings that achieve Passive House levels of performance to 100% by 2030.

At the May 27, 2019 meeting of Council the following motion was carried:

"That Council direct staff to review the municipal tools for catalyzing net-zero energy development identified in the Federation of Canadian Municipalities/GMF Feasibility study, consult with community partners as needed, and return to Council with implementation options and recommendations."

In response, a staff working group was established to investigate policy, regulatory and legislative tools potentially available to single tier municipalities in Ontario to incentivize and/or impose net zero carbon measures through development approvals under the *Planning Act*. The working group carried out their investigations under three general themes:

1. Building Energy Efficiency/Ontario Building Code/Passive House Standard
2. Land Use Policy/Legislation/Development Approvals
3. Research/Literature Review

Attachments 1-3 summarizes the results of the staff investigations into these three theme areas. **Attachment 4** provides the list of potential tools identified and an initial evaluation of each tool.

Based on an initial evaluation, the following items have been identified as the most promising opportunities that could warrant further investigation. Each tool/approach is briefly described and next step(s) are outlined.

Building Energy Efficiency/Ontario Building Code/Passive House in Standard

Opportunity 1: That the City identify and participate in advocacy efforts to promote changes to the Ontario Building Code, in collaboration with OEG, with the objective of achieving net zero carbon construction standards by 2030.

Description: Municipalities in Ontario cannot impose conditions of development approval that require new building construction to exceed the energy efficiency standards set out in the Ontario Building Code (OBC). This is a key limitation to achieving the City's targets for net zero carbon new construction. To address this limitation the OBC would have to be amended, or municipalities would need to be given the authority to impose standards higher than the OBC. The City could participate in advocacy efforts in this regard. Advocacy efforts could also include promoting amendments to planning and other legislation to give municipalities more authority to impose mandatory conditions of development approval related to net zero carbon development.

Opportunity 2: Participate in the New Construction Advisory Group to be established by Our Energy Guelph.

Description: The CEI Update Report presented to Council in May 2019 identifies the convening of an advisory group for new construction as one of OEG's proposed immediate work plan priorities once an Executive Director is in place. The City would participate in the advisory group subject to the availability of staff resources and mandate of the group.

Land Use Policy/Legislation/Development Approvals

Opportunity 3: Integrate Community Energy Initiative Update considerations into the development review process.

Description: Planning staff have already begun to identify CEI Update objectives to prospective development applicants. Through the mandatory pre-consultation process staff can identify the need to include a CEI Update report as part of the complete application submission. Through this report an applicant will identify what measures they are proposing to incorporate into the development to contribute to achieving Council's net zero carbon development targets, focusing on net zero carbon construction. As noted in Attachment 2, due to limitations in current planning legislation, an applicant's commitment to implement net zero carbon measures will largely be achieved through voluntary action and negotiation with the City.

Opportunity 4: Consider the objectives of the CEI Update through the City's next Official Plan Review.

Description: As outlined in Attachment 2, the City's current Official Plan contains policies that were designed to contribute to achieving the targets of the 2007 Community Energy Plan. The next review and update of the City's Official Plan is being initiated in 2020 and will afford an opportunity to consider how to respond to the goals, objectives and targets of the 2018 CEI Update, and subsequent reports, such as Report IDE-2019-47 Community Energy Initiative Update: Pathway to Net Zero Carbon by 2050.

Opportunity 5: Consider the objectives of the CEI Update through Secondary Planning.

Description: The Clair Maltby Secondary Plan that is currently underway includes the development of energy policies aimed at pursuing the City's CEI Update objectives. Block Plans to be prepared by proponents of development within the Guelph Innovation District are required to include a net zero carbon strategy component to indicate how development will contribute to achieving the City's net zero targets.

Opportunity 6: Consider the objectives of the CEI Update through the City's Comprehensive Zoning By-law Review.

Description: The Comprehensive Zoning By-law Review process that is currently underway is taking into consideration the CEI Update. Zoning regulations cannot address building construction methods, and cannot therefore directly contribute to achieving net zero carbon new construction targets. It is also not possible under current legislation to make zoning approvals conditional on achieving specific municipal objectives, such as net zero carbon construction. However, there may be opportunities to include regulations that enable or facilitate lower carbon development patterns, such as bicycle parking requirements, reduced vehicular parking requirements in strategic growth areas, broader pedestrian areas, etc.

Research/Literature Review

Opportunity 7: Consider establishing a Community Improvement Plan (CIP) focused on incentivizing net zero carbon development.

Description: Through the research and literature review, numerous examples of financial incentives were identified, particularly in jurisdictions such as Ontario, where municipalities are limited in what they can mandatorily impose through development approvals. The most common tool used to design and deliver a package of financial incentives aimed at facilitating specific municipal policy objectives is a CIP enacted under the *Planning Act*. The City has extensive experience with CIP's through the Brownfield Redevelopment and Downtown CIP's. Developing and operationalizing a Net Zero Carbon Development CIP would require significant staff and financial resources. Therefore, this concept is going to be assessed through the City's current Strategic Plan action planning process, and potential next steps will be reviewed with Council in the context of the Strategic Plan action planning.

Opportunity 8: Encourage and recognize excellence in net zero carbon development and building projects through an awards and recognition program.

Description: Publicly recognizing positive examples of net zero development and new construction in the City is one way of promoting voluntary innovation. The City's Urban Design Awards program that is being re-launched in 2020 includes criteria associated with innovation in sustainable development, including net zero carbon measures.

Opportunity 9: Develop net zero carbon development guidelines.

Description: A number of municipalities have developed guidelines or standards to help facilitate or encourage more "sustainable" development patterns. These can include a compilation of relevant best practices, model green development or building standards, and a listing of available resources and funding programs. Such guidelines are generally used as a resource to help staff and development proponents explore opportunities through development applications. As with the concept of exploring a net zero CIP, this idea will be assessed through the Strategic Plan action planning process.

Summary:

In summary, this report discusses the range of tools and opportunities that could potentially assist the City in pursuing its net zero carbon development goals, with a focus on new construction, and identifies the 9 most promising opportunities and related recommended next steps. Opportunities 3, 4, 5, 6 & 8 will be pursued through current or planned City initiatives. Opportunities 1, 2, 7 & 9 would require the allocation of staff resources and funding, and will be assessed in the context of overall City priorities through the ongoing Strategic Plan action planning process, the results of which are scheduled to be presented to Council in June 2020.

Financial Implications

There are no immediate financial implications associated with this report. A number of the potential opportunities described in this report could have financial implications, which would have to be further examined if the City were to pursue implementing such tools. These will be assessed through the City's Strategic Plan action planning process.

Consultations

Multiple City departments were involved in the Net Zero Carbon Development working group, including: Planning and Building Services; Facilities and Energy Management; Legal and Realty Services, and Business Development and Enterprise. The Finance Department was also consulted. No external consultation was undertaken in the preparation of this report.

Strategic Plan Alignment

Priority

Sustaining Our Future

Direction

Plan and design an increasingly sustainable City as Guelph grows.

Alignment

Identifying and implementing tools that can be used to facilitate the City's net zero carbon goals through new development is aligned with this priority of the Strategic Plan and will help prepare Guelph for a net zero carbon future.

Attachments

Attachment 1 - Net Zero Development Working Group - Building Energy Efficiency/Ontario Building Code/Passive House Standard

Attachment 2 - Net Zero Development Working Group - Land Use Policy/Legislation/Development Approvals

Attachment 3 - Net Zero Development Working Group - Research/Literature Review

Attachment 4 - Table 1: Summary of Potential Tools

Departmental Approval

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Internal Memo

Date January 10, 2020
To **Todd Salter**
From Net Zero Carbon Development Working Group
Service Area Infrastructure, Development and Enterprise Services
Department Planning & Building Services, Facilities and Energy Management
Subject **Building Energy Efficiency, Ontario Building Code and Passive House Standard**

Introduction

Council has directed staff to explore potential tools that could be used through the development approvals process to facilitate achievement of “net zero” carbon targets set out in the Community Energy Initiative (CEI) Update.

This memo provides a brief overview of the science of building energy efficiency, outlines current Ontario Building Code Standards in relation to building energy efficiency, reviews technical approaches to increasing efficiency, including cost/benefit where information is readily available, and discusses the Passive House Standard and how it could be applied to new non-residential buildings in Guelph.

Context

City of Guelph CEI Update

Two referenced actions from the CEI Update – Pathway to Net Zero Carbon by 2050 Appendix: Actions in the low carbon pathway are as follows:

1. Incrementally increase the number of net zero new homes to 100% by 2030
2. Incrementally increase the number of non-residential buildings that achieve Passive House levels of performance to 100% by 2030

Background on Building Energy Efficiency

Concern over building energy consumption has persisted in Canada since the oil crises in the 1970's. The first initiatives to conserve energy were rooted in safeguarding Canada's energy security, however, more recently attention has shifted to mitigating negative climate impacts by reducing greenhouse gas emissions resulting from excessive energy consumption. Early conservation

initiatives focused heavily on installing insulation in accessible locations and rudimentary draft proofing. However, this was done without consideration of impacts to other building components, such as the performance of combustion equipment and associated impacts on indoor air quality. Research in the field of building science and best practice standards for energy efficiency now recognize that buildings are comprised of multiple, complex systems that need to be considered as a whole to ensure optimal performance and avoid potential negative impacts to the longevity of buildings and the health of their occupants. For example, upgrading insulation levels and reducing building air leakage must also be accompanied by dedicated mechanical ventilation to deliver fresh air for building occupants and to allow recovery of energy that would otherwise be exhausted to the outdoors.

Some of the key energy efficiency measures addressed in building codes and voluntary energy efficiency standards, include:

- Increase insulation levels
- Better performing windows and doors
- Increase heating and cooling equipment efficiency
- Provide mechanical ventilation systems with energy recovery
- Provide efficient hot water systems and insulate hot water piping
- Automatic shutoff controls for lighting and idle electrical equipment
- High efficiency (LED) lighting systems
- Reduce overall window areas to prevent overheating and minimize heat loss
- Reduce building air leakage
- Minimize heat loss associated with thermal bridging by eliminating uninsulated components in exterior building assemblies

Many energy efficiency standards recognize the importance of focusing on the so called “passive” building elements, which are non-mechanical systems that can reduce heat loss, thereby minimizing the need to expend additional energy to heat or cool a building to compensate for these losses. By reducing these losses, it may also be possible to install smaller, more cost effective heating and cooling systems. Further, items included under the “passive” category, such as insulation, generally have a much longer service life than mechanical systems and are often more costly and difficult to upgrade at a later date without substantial disruption to building occupants.

It is important to distinguish between the various definitions of “Net Zero” used by different energy efficiency standards. For example, the Canadian Home Builders Association has a Net Zero Energy Homes program for low-rise residential construction, which contains two distinct certifications: 1) “Net Zero Energy Ready” and 2) “Net Zero Energy Home”.

- **Net Zero Energy Ready (NZEr) Home: “is a home that is NZE but has not yet installed the renewable energy component”**
- **Net Zero Energy (NZE) Home: “A NZE home is one that is designed, modelled and constructed to produce as much energy as it consumes**

on an annual basis. The energy produced is generated on-site and is renewable. NZE can be achieved via net-metering or on-site generation and storage”.

It should be noted that both of these certifications use site energy as the basis for calculation, meaning the calculated theoretical difference between modelled consumption and production at the home’s electricity and gas meters. While site energy consumption is often used as a proxy for carbon emissions, it is not as accurate as using source energy or directly addressing carbon emissions. Further, achieving certification with these standards does not guarantee that the home will actually achieve net zero energy on an annual basis once constructed and occupied. This is due to a multitude of factors, the most significant of which include homeowner energy consumption behaviour and yearly variations in weather.

Some standards target net zero carbon instead of energy. For example, the Canada Green Building Council’s (CaGBC) recently launched the Zero Carbon Building standard that was developed specifically for large buildings with the Canadian context in mind. **The definition used by the CaGBC Zero Carbon Building standard is as follows: “A zero carbon building is a highly energy efficient building that produces on-site, or procures, carbon-free renewable energy in an amount sufficient to offset the annual carbon emissions associated with building operations”.**

Other programs, such as the Toronto Green Standard (TGS) consist of measures mandating increased energy efficiency for buildings and reduced carbon emissions with the goal of near-zero emissions buildings by 2030. TGS includes four different tiers, representing different levels of energy efficiency and carbon emission reductions, with Tier 1 being the current mandatory requirement for planning approvals in the City of Toronto. Refunds to development charges are offered for applications meeting higher voluntary standards of Tiers 2 through 4 of TGS. **The Toronto Green Standard, version 3 defines Tier 4, the top level of certification as follows: “Tier 4 targets represent a near-zero level of emissions performance, at which point fuel switching is promoted to foster a shift away from natural gas towards electricity and renewable energy sources”.**

While it may be convenient to choose just one standard as the reference for verifying conformance with a net zero carbon development requirement or rebate program, it may not be applicable to all building types or relevant to site specific constraints. Each of the different net zero standards offer unique advantages and disadvantages, determination of which would be best left to the building designer to determine on a project by project basis.

Energy Efficiency Requirements in the Current Ontario Building Code

The Ontario Building Code (OBC) sets minimum requirements for building construction, including energy efficiency for new low-rise residential buildings under Supplementary Standard SB-12 and energy efficiency and carbon emissions for new commercial, institutional, industrial and non low-rise residential buildings under Supplementary Standard SB-10.

Prior to the most recent provincial election, the energy efficiency requirements of the OBC were poised to become more stringent on January 1, 2020, including

planned increases in energy efficiency towards the goal of a “net zero energy ready” building code by 2030. However, the current provincial government has shelved these planned code updates and also revoked all requirements mandating rough-in and installation of electric vehicle charging infrastructure in buildings containing parking facilities. To date, the government has not provided any indication whether future updates related to increasing energy efficiency requirements in the OBC will be undertaken. Meanwhile, the federal government, via the Canadian Commission on Building and Fire Codes (CCBFC), continues development of the model National Building Code and National Energy Code for Buildings with a stated goal that by 2030, all new buildings will be “near net zero energy ready”. The federal government announced the goal of harmonizing building codes across Canada in their 2018 Federal Fall Economic Statement and code harmonization was highlighted in the 2019 Ontario Budget, however, provinces and territories ultimately have the authority to decide whether or not to adopt specific National Building Code and National Energy Code requirements.

Current energy efficiency measures covered in the OBC include: prescribed minimum levels of insulation for roofs, walls, foundations and floors and mandating the use of double pane windows with improved thermal performance. The OBC also contains minimum standards covering the efficiency of mechanical systems such as water heaters, furnaces and air conditioning units. For large buildings, the OBC also regulates the efficiency of lighting systems, pumps, motors and energy using fixed appliances, such as refrigerated display units in grocery stores.

While the OBC does contain basic requirements covering building air leakage, including mandating installation of a continuous air barrier and defining acceptable materials to be used for the air barrier, it does not currently require testing of buildings for air leakage, nor does it set a limit on acceptable levels of air leakage. Air leakage is, however, one of the most important considerations in building energy efficiency, since leakage of air from buildings results in lost energy from heating or cooling. Several voluntary building standards, including the Passive House standard, set stringent limits on the air leakage allowed for buildings targeting certification and mandate air leakage testing of each building to verify compliance with these limits. Several North American jurisdictions, including the province of British Columbia and the state of Washington have legislated requirements for air leakage testing and limits on acceptable levels of building air leakage.

Passive House Standard – Applicability to Non-Residential and Non-Low Rise Residential Buildings

The Passive House Institute U.S. (PHIUS) developed a climate specific iteration of the International Passive House Standard, which is more broadly applicable across North America’s highly varied climate regions. The PHIUS+ 2018 Passive Building Standard is applicable to all buildings, including multi-unit residential and large non-residential building types. Requirements differ somewhat between single-family projects and large buildings, due to differences in design requirements and energy use patterns. It is a pass/fail performance-based energy standard that also includes prescriptive quality assurance provisions adopted from U.S. government programs, such as Energy Star and Zero Energy Ready Home.

While the PHIUS+ 2018 standard does not directly limit carbon emissions from buildings, it does put a limit on overall source energy consumption through the use of a net source energy criterion. **Source energy is considered a better representation of emissions associated with energy use of a building than site energy, as source energy accounts for losses associated with the extraction, generation and distribution of energy.** In the rationale for implementing a limit on source energy, the PHIUS+ 2018 standard documentation states that: “[t]he source energy limit is not set based on cost optimization, but rather on the ‘fair share’ of carbon emissions allowed for each sector. To limit global warming and avoid many harmful impacts on society, emissions must go to zero overall and the energy system must go to 100% renewable”.

Further, in order to comply with the required net source energy criterion, the PHIUS+ 2018 standard allows for offsetting source energy consumption of a building with both on-site and off-site renewable generation. Off-site renewables may consist of: Virtual Power Purchase Agreements, community renewables, directly owned off-site renewable, and renewable energy credits.

Several other voluntary energy efficient and low carbon building standards are used throughout Canada. These include:

- Toronto Green Standard, Version 3
- Canada Green Building Council – Zero Carbon Building Standard
- Canadian Home Builder’s Association – Net Zero Energy & Net Zero Energy Ready Homes Standard, which is only applicable to low-rise residential buildings

As is the case with the PHIUS+ 2018 standard, each of these other standards have rigorous requirements that must be met which includes third party verification of the design and construction, before certification is granted.

Comparison of OBC and energy efficiency/low carbon building standards

A comparison analysis was conducted to determine the level of carbon emission reductions possible from upgrading energy efficiency of buildings beyond minimum OBC requirements to meet two different voluntary energy efficiency standards. Standards selected for comparison include the PHIUS+ 2018 Passive Building Standard and Toronto Green Standard, version 3. Toronto Green Standard was selected for comparison with the PHIUS+ 2018 Standard, as it represents a currently active energy efficiency program being used in Ontario’s largest City. An additional comparison case examines the impact to building carbon emissions by switching from natural gas in the code compliance case to 100% electric resistance heating with no additional upgrades. Several code compliant building cases were selected to represent low-rise residential, non-low rise residential and commercial buildings. These cases are based on actual building permit applications received since December 31, 2016 in the City of Guelph, which is reflective of the current energy efficiency requirements of the OBC. Full details of these analyses are provided in Appendix A.

The analysis indicates that building carbon emissions reductions up to approximately 90% from the OBC compliant design are attainable by designing to meet the PHIUS+ 2018 Passive Building Standard, regardless of building type. A similar level of carbon emissions reductions is achievable by designing buildings to comply with Tier 4 of the Toronto Green Standard, version 3 for commercial and non-low rise residential buildings. However, for low-rise residential buildings, the level of emissions reductions attainable is less pronounced, at approximately 60% less than the OBC compliant design.

Interestingly, fuel switching from natural gas for heating and hot water production to electric resistance with no additional energy saving measures yielded substantial carbon emissions reductions of around 58% for low-rise residential buildings to 65% and 68% reductions for non-low rise residential and commercial buildings, respectively. This is primarily due to the heavy reliance of all building types on natural gas as an inexpensive energy source for space heating and hot water production and the relatively high carbon intensity of natural gas when compared with electricity. It is important to note that even greater emissions reductions would be attainable if implementing advanced electrically powered technologies, such as ground source or air source heat pumps for space heating and hot water production. Due to the higher current cost of electricity as an energy carrier relative to natural gas, it is still recommended to add insulation and reduce air leakage in order to minimize energy costs for electrically heated buildings.

From the analyses summarized above, it can be concluded that significant carbon emissions reductions are attainable by designing new buildings of any type to comply with voluntary energy efficiency standards. Although only two standards have been analyzed here, other energy efficiency and low-carbon standards would be expected to enable similar levels of carbon emissions reductions. Additionally, incentivizing fuel switching could also result in substantial carbon emissions reductions, although likely not to the same extent as designing to either of the efficiency standards analyzed.

References

PHIUS+ 2018 Passive Building Standard:

<https://www.phius.org/media/W1siZiIsIjIwMTgvMTEvMDIvM2puNXJ3NnV2cV9QSElVU18yMDE4X1N0YW5kYXJkX1NldHRpbmdfRG9jdW1lbnRhdGlvbI92MS4wLnBkZiJdXQ?sha=1ca3bc8e>

The City of Toronto Zero Emissions Buildings Framework Report:

<https://www.toronto.ca/wp-content/uploads/2017/11/9875-Zero-Emissions-Buildings-Framework-Report.pdf>

Toronto Green Standard v3 – Sustainability Requirements for New Development in Toronto – Mid to High-Rise Residential & All Non-Residential:

<https://www.toronto.ca/legdocs/mmis/2017/pg/bgrd/backgroundfile-107487.pdf>

CaGBC Zero Carbon Buildings Framework For Commercial, institutional and Multi-Family Buildings in Canada, November 2016:

https://www.cagbc.org/cagbcdocs/NetZero/2016_CaGBC_Zero_Carbon_Framework_Full_Framework.pdf

Canadian Home Builder's Association Net Zero Energy Labelling Program Pilot – January 2016, Version P1: http://www.enerquality.ca/wp-content/uploads/2016/04/netZeroStandardPilot_vP01.pdf

APPENDIX A – Details of Carbon Emissions Comparison Analysis of OBC vs. Select Voluntary Energy Efficiency Standards

A basic comparison analysis is performed to determine where the OBC requirements for energy efficiency and carbon emissions currently stand in relation to the net zero carbon goal. Three categories of buildings were analysed, including:

1. low-rise residential buildings regulated under Supplementary Standard SB-12
2. commercial buildings regulated under Supplementary Standard SB-10
3. non-low rise residential buildings (apartment buildings and condo buildings) regulated under Supplementary Standard SB-10.

Two building energy efficiency standards were selected for this analysis based on their relevance to the goal of net zero carbon and the ability to translate the criteria of these standards for comparison with the OBC requirements. The selected standards are:

1. Passive House Institute U.S. (PHIUS+ 2018 Passive Building Standard)
2. Toronto Green Standard Version 3 (TGS v.3) – Tier 4 compliance for energy and carbon emissions

Data was collected and aggregated from building permit applications received within the past couple of years, representing the maximum annual energy consumption and carbon emissions allowed per the Code for these specific buildings. Model results presented in Table 1 are on a per square meter of occupied, heated building floor area and are compared with Passive House and TGS v.3, Tier 4 standards.

Table 1 – Comparison of Annual Energy Intensity for Buildings Designed to OBC, Passive House and TGS v.3 Tier 4 requirements

Criteria	Ontario Building Code (SB-10 or SB-12)	Passive House Standard (PHIUS+ 2018)	Toronto Green Standard v3, Tier 4
	Energy Intensity kWh/m2-year	Energy Intensity kWh/m2-year, (% reduction vs OBC)	Energy Intensity kWh/m2-year, (% reduction vs OBC)
Low Rise Residential (buildings < 4 stories)	96	27 (72% reduction)	70 (27% reduction)
Non- Low Rise Residential (buildings > 3 stories)	260	56 (79% reduction)	75 (71% reduction)

Criteria	Ontario Building Code (SB-10 or SB-12)	Passive House Standard (PHIUS+ 2018)	Toronto Green Standard v3, Tier 4
	Energy Intensity kWh/m2-year	Energy Intensity kWh/m2-year, (% reduction vs OBC)	Energy Intensity kWh/m2-year, (% reduction vs OBC)
Commercial Buildings	367	110 (70% reduction)	68 (82% reduction)

Table 2 – Comparison of Annual Carbon Intensity for Buildings Designed to OBC, Passive House and TGS v.3 Tier 4 requirements

Criteria	Ontario Building Code (SB-10 or SB-12)	Passive House Standard (PHIUS+ 2018) ^b	Toronto Green Standard v3, Tier 4
	Carbon Intensity kg CO2eq/m2-year	Carbon Intensity kg CO2eq/m2-year, (% reduction vs OBC)	Carbon Intensity kg CO2eq/m2-year, (% reduction vs OBC)
Low Rise Residential (buildings < 4 stories)	12 ^a	1 (92% reduction)	5 (60% reduction)
Non- Low Rise Residential (buildings > 3 stories)	37	3 (92% reduction)	5 (86% reduction)
Commercial Buildings	56	6 (89% reduction)	4 (92% reduction)

Notes to Table 2:

a. The OBC does not have a defined maximum allowable carbon emissions criteria for low rise residential buildings in Supplementary Standard SB-12, the energy model data were used to calculate what these emissions would be based on the proportions of annual electricity and natural gas consumption to allow for comparison with the requirements of the two standards.

b. The PHIUS+ 2018 does not have specifically defined criteria for maximum allowable carbon emissions. The estimated carbon emissions presented in the table are calculated based on the PHIUS+ 2018 net source energy criteria and carbon emission factors for Ontario's electricity grid.

Table 3 – Comparison of Annual Carbon Intensity for Buildings Designed to OBC and the Same Buildings with Fuel Switching to 100% Electric

Criteria	Base Ontario Building Code Case (SB-10 or SB-12)	Ontario Building Code + Fuel Switching to 100% Electric^b
	Carbon Intensity kg CO ₂ eq/m ² -year	Carbon Intensity kg CO ₂ eq/m ² -year, (% reduction vs Base OBC Case)
Low Rise Residential (buildings < 4 stories)	12 ^a	5 (58% reduction)
Non- Low Rise Residential (buildings > 3 stories)	37	13 (65% reduction)
Commercial Buildings	56	18 (68% reduction)

Notes to Table 3:

a. The OBC does not have a defined maximum allowable carbon emissions criteria for low rise residential buildings in Supplementary Standard SB-12, the energy model data were used to calculate what these emissions would be based on the proportions of annual electricity and natural gas consumption to allow for comparison with the requirements of the two standards.

b. It was assumed that all natural gas using systems were converted to straight electric resistance heating. Additional reductions in carbon emission intensity could be realized through the use of electric heat pumps. Calculations are based on carbon emission factors for Ontario's electricity grid.

Internal Memo

Date	January 10, 2020
To	Todd Salter
From	Net Zero Carbon Development Working Group
Service Area	Infrastructure, Development and Enterprise Services
Department	Planning and Building Services, Legal, Realty and Court Services
Subject	Land Use Policy, Legislation and Development Approvals

Introduction

Council has directed staff to explore potential tools that could be used through the development approvals process to facilitate achievement of “net zero” carbon targets set out in the Community Energy Initiative (CEI) Update.

This memo examines potential tools, opportunities and limitations related to land use policy, legislation and development approvals processes.

Policy Context

Provincial Policy Statement (PPS) 2014 - Climate Change Overview (planning decisions shall be consistent with)

The Provincial Policy Statement (2014) (PPS) recognizes that efficient development patterns optimize the use of land, resources and public investment. In turn, this assists in creating strong, liveable and healthy communities that promote and enhance human health and social well-being, are economically and environmentally sound, and are resilient to climate change.

The PPS requires that municipalities shall support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and climate change adaptation through land use and development patterns which:

- a) promote compact form and a structure of nodes and corridors;
- b) promote the use of active transportation and transit in and between residential, employment (including commercial and industrial) and institutional uses and other areas;

- c) focus major employment, commercial and other travel-intensive land uses on sites which are well served by transit where this exists or is to be developed, or designing these to facilitate the establishment of transit in the future;
- d) focus freight-intensive land uses to areas well served by major highways, airports, rail facilities and marine facilities;
- e) improve the mix of employment and housing uses to shorten commute journeys and decrease transportation congestion;
- f) promote design and orientation which:
 1. maximizes energy efficiency and conservation, and considers the mitigating effects of vegetation; and
 2. maximizes opportunities for the use of renewable energy systems and alternative energy systems; and
- g) maximize vegetation within settlement areas, where feasible.

Through the review of Planning Act applications, consistency with the PPS must be considered and analyzed. However, the PPS does not provide specific policy direction with respect to building construction methods, nor does it require Net Zero Carbon development.

The PPS is currently being reviewed by the Provincial Government. An updated PPS is expected in late 2019 or early 2020. One notable proposed change includes introducing a defined term 'impacts of a changing climate' which means 'the potential for present and future consequences and opportunities from changes in weather patterns at local and regional levels including extreme weather events and increased climate variability'.

A Place to Grow - Climate Change Overview (planning decisions shall conform or not conflict with)

The Greater Golden Horseshoe contains many of Ontario's significant ecological and hydrologic natural environments. These natural areas support biodiversity, provide drinking water for the region's inhabitants, sustain its many resource-based industries, support recreational activities that benefit public health and overall quality of life, and help moderate the impacts of climate change.

One of the guiding principles of A Place to Grow: the Growth Plan for the Greater Golden Horseshoe is to integrate climate change considerations into planning and managing growth. This could include planning for more resilient communities and infrastructure – that are adaptive to the impacts of a changing climate – and moving towards environmentally sustainable communities by incorporating approaches to reduce greenhouse gas emissions.

The policies in the Growth Plan encourage municipalities to plan 'complete communities' which support climate change mitigation and adaptation and reduce greenhouse gas emissions through various different methods and strategies including: protecting natural areas; planning for green infrastructure; and, increasing the modal share of transit and active transportation, among other things.

Through the review of planning act applications, conformity with A Place to Grow must be considered and analyzed. However, the growth plan does not provide specific policy direction with respect to building construction methods, nor does it require Net Zero Carbon development.

Conclusion

While it is noted that both the PPS and the Growth Plan should be read and applied in their entirety, some policies have broader implications and should be enacted through the City's Official Plan (OP), others are more relevantly applied through the review of site-specific development applications under the Planning Act. As both the PPS and the Growth Plan are implemented at the local municipal level, this must be taken into consideration.

Consistency or conformity with these two provincial documents is an important consideration when reviewing and evaluating a development application under the Planning Act. However, both only require that it be demonstrated that planning for climate change has been considered. At this time, neither require that development be carbon neutral, therefore while they can be used as a basis for local climate change related policies, they cannot be relied upon to require conformity with the City's Net Zero Carbon by 2050 goal.

City of Guelph Official Plan

The City's Official Plan provides policies to contribute to achieving the targets of the City's Community Energy Plan (CEP) (2007).

OP sections 4.6 entitled 'Climate Change' and 4.7 entitled 'Community Energy' provide a policy framework for increasing community resiliency to climate change and demonstrating corporate leadership in reducing energy use. Section 4.6 focuses on actions the City could take through the development of a climate adaptation strategy with its partners. Section 4.7 generally encourages action on the part of the City to implement the CEP (2007) and provides policies that are mainly a restatement of the CEP in the Official Plan. Its primary focus is on the City's plans for district energy as set out in the CEP (2007) and how the City would support the development of district energy systems. Section 4.7 also provides encouragement policies for building end-use energy efficiency by suggesting ways in which energy efficiency could be achieved through the development and construction processes.

OP chapter 11.2, entitled 'Guelph Innovation District Secondary Plan' contains policies that support the creation of sustainable and energy efficient infrastructure in the development of this area. These policies were largely premised on the development of, and connection to, an integrated energy distribution system and the use of low impact development standards. Specifically, section 11.2.3.2 provides policies that encourage development to approach carbon neutrality through gains in energy efficiency in built form and by sourcing additional needs from renewable sources and encourages roof area to be dedicated to roof top solar.

The OP policies related to climate change, energy and the CEP are encouragement policies; they encourage action to achieve the goals of the CEP and the vision of the OP. They provide a framework for achievement of goals through willing partners, negotiation, and education. They are not prescriptive.

Planning Act Applications and Relevant Legislation

Planning Act applications have been and assessed with respect to the opportunities and constraints of implementing Net Zero Carbon requirements, focussing on CEI Technical Actions 1 and 2 that apply to new buildings, as follows:

1. Incrementally increase the number of net zero homes to 100% by 2030.
2. Incrementally increase the number of non-residential buildings that achieve Passive House levels of performance to 100% by 2030.

The different planning applications that have been identified for this discussion are:

- Zoning By-law Amendments
- Official Plan Amendments
- Draft Plan of Subdivision
- Consent to Sever applications
- Minor Variances
- Site Plan

A brief description of the relationship between the Ontario Building Code and these Planning Act applications is provided for the purpose of context prior discussing any details under the various types of applications.

The Ontario Building Code is a regulation under the Building Code Act. It establishes detailed technical and administrative requirements and minimum standards for building construction. In addition, there is other applicable law that must be satisfied prior to issuance of a building permit, and this includes compliance with the City's Zoning By-law. However, there are limitations to what can be imposed through zoning, noting that conditional zoning cannot be imposed and that zoning cannot regulate the manner of building construction.

Subsection 10(2) of the Municipal Act conveys authority on single-tier municipalities to pass By-laws respecting the economic, social, and environmental well-being of the municipality. This, however, is limited by section 14 of the Municipal Act, which explains that a By-law is without effect to the extent of any conflict with a provincial Act or a regulation made under such an Act (which mandates the common law "paramountcy doctrine" approach to resolving conflicts between By-laws and provincial legislation).

Section 35 of the Building Code Act sets out the following:

35 (1) This Act and the building code supersede all municipal by-laws respecting the construction or demolition of buildings.

(2) In the event that this Act or the building code and a municipal by-law treat the same subject-matter in different ways in respect to standards for

the use of a building described in section 10 or standards for the maintenance or operation of a sewage system, this Act or the building code prevails and the by-law is inoperative to the extent that it differs from this Act or the building code.

Therefore, while Council could pass a By-law dealing with the environmental well-being of the City, it would be without effect and inoperative to the extent that it conflicted with, or treated the subject-matter differently than, the Building Code Act or Building Code.

Despite these limitations identified, the City will continue to negotiate and encourage carbon neutral construction techniques throughout the various steps of the development planning process, beginning at the earliest pre-consultation stages. This will be done in an effort to voluntarily solicit cooperation and get agreement from owners to implement energy efficiencies into their developments towards meeting CEI Technical Actions 1 and 2.

Zoning Bylaw Amendments

A Zoning By-law controls the use of land. Within the geographic boundaries of the City it mandates:

- how land may be used
- where buildings and other structures can be located
- the types of buildings that are permitted and how they may be used
- the lot sizes and dimensions, parking requirements, building heights and setbacks from the street
- minimum landscape requirements
- parking and loading facilities.

If a proposed development is not in accordance with the zoning bylaw, a zoning bylaw amendment can be requested to change how the land is used and/or specific zoning regulations. However, zoning and zoning bylaw amendments cannot determine how a building is constructed. Building construction details are outside the scope of the Planning Act development processes. Therefore, Planning review of a Zoning By-law amendment application (or any Planning Act development application) cannot make recommendations for approval or refusal on the basis of whether or not certain Net Zero Carbon targets through building construction are being met. It is recognized that zoning by-law amendment applications must conform with the OP, which does include Climate Change (Section 4.6) and Community Energy (Section 4.7) policies. However, as stated previously, these are encouragement policies and not prescriptive.

It is acknowledged that there could be specific zoning provisions implemented through approvals, which still represent good planning as part of a comprehensive development review process that could facilitate the future implementation of low and net zero carbon measures associated with the final building design. For example, this could include consideration of the orientation of buildings to

accommodate solar panels, and establishing specific building envelopes to address efficiencies. However, it is important to note that zoning by-law amendments cannot be passed subject to conditions, such as tying the approval of specialized zoning regulations to requirements that are related to how the building is constructed.

Official Plan Amendments (OPA)

Development applications that include a request to amend the Official Plan relate to broader land use designations and policies and no opportunities to respond to Technical Actions 1 and 2 in the CEI through the OPA process have been identified.

Draft Plan of Subdivision

Section 51(24) of the Planning Act outlines the criteria to be considered in reviewing a proponent's draft plan of subdivision application and includes "the extent to which the plan's design optimizes the available supply, means of supplying, efficient use and conservation of energy".

Conditions of Draft Plan approval and conditions within subdivision agreements will also be carried forward and implemented into the detailed design and ultimate development of the approved subdivision. Staff will also pursue opportunities to have conditions relating to CEI Technical Actions 1 and 2 implemented into site plan control agreements for development blocks within the plan, albeit as a voluntary action by the owner.

While conditions relating to building construction may not be enforceable (as previously discussed), planning staff's review and recommendations associated with a draft plan of subdivision application do include consideration of other sustainability and energy efficiency goals of the Official Plan that can assist in meeting net zero carbon targets in the CEI update. This includes such matters as considering lot orientation for solar access, mix of land use and density to support transit and pedestrian oriented development, low impact development, provision of centralized shared parking, water efficiency measures, etc. The subdivision review process also presents opportunities to implement alternative development standards for streets, utilities and infrastructure that could facilitate the implementation of Net Zero Carbon solutions.

Consent to Sever Applications (Committee of Adjustment)

The planning review of consent to sever application generally utilize the same review criteria as draft plan of subdivision applications, so therefore could include energy conservation measures with conditions of consent applied to approvals. However, the Committee of Adjustment does not have authority to impose conditions related to building construction, and any recommendations from staff would require voluntary uptake from proponents.

Minor Variances (Committee of Adjustment)

Planning staff review of minor variance applications are limited in scope to meeting all 4 tests under Section 45(1) of the Planning Act as follows:

- Is the application minor?
- Is the application desirable for the appropriate development of the lands in question?
- Does the application conform to the general intent of the Zoning Bylaw?
- Does the application conform to the general intent of the Official Plan?

Assessing energy efficiency in building construction can form part of the Official Plan conformity test with respect to the relevant climate change policies in the Official Plan. However, because the Official Plan policies are “encouraging” in nature, the staff recommendations or decision could not be determinative on this one component in recognition that construction standards are beyond the scope of the Committee of Adjustment.

Site Plan

The opportunity to apply condition(s) relating to net zero carbon commitments into site plan control agreements has been identified, subject to agreement by the owner. However, if an owner voluntarily agrees to have such a condition implemented into a site plan control agreement it would be unlikely that such a condition could be enforced in the case of future non-performance given the clear limitations of site plan control to determine building construction. Section 41 (4.1) of the Planning Act lists the following matters that staff cannot consider when approving/conditioning site plan applications:

- Interior design;
- The layout of interior areas, excluding interior walkways, stairs, elevators and escalators;
- The manner of construction and standards for construction.

Council has delegated the authority to approve/condition site plans to staff. It is recommended that staff continue to negotiate specific conditions and continue efforts in persuading owners to implement these type of conditions at the building permit stage. However, it would have to be done voluntarily recognizing once again that the construction of buildings is governed by the Building Code.

Development Application Review Process

The following outlines the various steps of the development review process for Planning Act applications (Official Plan and Zoning By-law Amendments and Draft Plan of Subdivisions) and discusses opportunities and constraints in integrating net zero carbon considerations into these development application review processes.

Pre-consultation

Through the mandatory pre-consultation meetings held at the Development Review Committee (DRC), City staff request information, material or studies to assess planning applications (OPAs, ZBLA, Draft Plan of Subdivision) as part of a complete application. It is recommended that these requirements include the submission of an Energy Strategy Report prepared by a qualified professional. Requiring this Energy Strategy Report would allow the early identification of opportunities to integrate energy solutions that are efficient and contribute to the CEI Net Zero Carbon goals. The nature and scope of Energy Strategy Report would vary based on the type of application being proposed but would be focused on addressing Action Items 1 and 2 in the CEI Update. The development of a Terms of Reference for the Energy Strategy Report is recommended to provide direction to proponents and could include the following elements:

- Establish baseline design energy performance
- Identify and evaluate opportunities for low-carbon energy solutions
- Identify passive and active conservation strategies that should be considered to reduce external loads on the building
- Estimate the contributions of the identified on-site and off-site low carbon solutions towards achieving zero emissions
- Identification of preferred scenario and recommendations and next steps for implementation

The Energy Strategy Report would be used by the development industry to provide upfront focus on additional requirements from development applications, those required, incented and/or encouraged through the climate change and energy efficiently policies of the Official Plan. This will also help identify opportunities early in the process that can be coordinated and help inform and build on the broader work of Our Energy Guelph (OEG).

Complete application review

Upon receipt of a formal application, planning staff would review the submission and ensure that the submission included the required Energy Strategy Report that was requested during the pre-consultation process prior to deeming the application complete.

Development Review (circulation for comment)

Once the planning application is deemed complete, which could include the submission of the required Energy Strategy Report, planning staff would circulate the application to internal and external departments and agencies for review and comments. Staff from Building Services and the Facilities and Energy Management Department could be used as a resource to review the proponent's energy strategy. This review could also be outsourced to an external peer reviewer if needed. Through the review of the application staff would continue to negotiate and encourage the ultimate implementation of identified net zero or low carbon

solutions, also taking advantage of any incentives or initiatives that may be developed through the broader work of the City and OEG.

Staff recommendation report

Once the review of the planning application is complete planning staff bring forward their planning recommendation report at the decision meeting at Council. This decision report would include a separate section in the main body of the report specifically addressing how the proposed development intends to address Technical Actions 1 and 2 of CEI Update. This section generally refers to a commitment letter prepared by the proponent as a separate attachment to the report that outlines the intended actions the owner intends to take to implement energy efficiencies into their development towards the net zero carbon goal. Zoning By-law amendment applications decision reports also include wording of a condition that would be intended to be applied at the subsequent site plan approval process. This is provided simply as information to Council recognizing that the zoning conditions cannot be tied to these approvals. In terms of draft plan of subdivision decision reports, the recommended conditions associated with a draft plan approval could contain a similar condition outlining how the proponent's development intends to address Technical Actions 1 and 2 of the CEI Update.

Site Plan Control

With the exception of applications that involve single detached and semi-detached dwellings, development applications approved by Council are subject to site plan approval with staff having delegated approval authority. As discussed previously, while staff could continue to negotiate and encourage owners to agree to construct towards meeting Net Zero Carbon targets, it would still have to be done voluntarily. Again, this is based on the recognition that the construction of buildings is governed by the Building Code.

Conclusion

Planning staff currently communicate CEI Update objectives to development proponent and request planning application submission requirements focussing on how their proposed development would contribute to achieving Council's Net Zero Carbon targets. However, due to the limitations in current planning legislation discussed and with the understanding that the construction of buildings is governed by the Ontario Building Code, an applicant's commitment to implement Net Zero Carbon measures ultimately relies on the voluntary action by development proponents.

Internal Memo

Date	January 10, 2020
To	Todd Salter
From	Net Zero Carbon Development Working Group
Service Area	Infrastructure, Development and Enterprise Services
Department	Planning and Building Services, Facilities and Energy Management
Subject	Research and Literature Review

Introduction

Council has directed staff to explore potential tools that could be used through the development approvals process to facilitate achievement of “net zero” carbon targets set out in the Community Energy Initiative (CEI) Update, and specifically referred the Federation of Canadian Municipalities/Green Municipal Fund Feasibility Study to staff for consideration.

This memo identifies key literature sources that were reviewed by staff, and summarizes potential tools identified through this review. To provide necessary context, the memo also defines the difference between “net zero carbon” and “net zero energy”.

Context

In May 2019, Guelph City Council endorsed the community target of Net Zero Carbon by 2050 with the focus of reducing carbon or greenhouse gas (GHG) emissions and acting on climate change. In alignment with this target initiative, there is opportunity to encourage the design and construction of new building sites to be more sustainable through the development approvals process, where energy usage is minimized and energy efficiency and production is maximized.

The term ‘Net Zero Carbon’ refers to a site’s zero balance of carbon emissions. Carbon emissions are generally produced from the use of energy and fuel such as, but not limited to, electricity, natural gas, diesel and gasoline. Energy conservation and energy efficiency, or using low-to-no carbon emission energy sources, are strategies that reduce the amount of site generated carbon emissions. Carbon emissions can also be offset by sequestering carbon through methods such as growing trees and natural elements, or by purchasing carbon credits to bring the carbon emissions accounting to net zero. The accounting period is typically for a given a year.

This is different than ‘Net Zero Energy’ which is defined as when a site’s net energy use is equal to zero, or all energy needed for the site can be produced onsite and is renewable.

Strategies such as energy conservation and energy efficiency will reduce energy usage, while generating energy at the site will counter energy consumption and bring the energy accounting to net zero. Again, the accounting period is typically for a given a year.

Guelph City Council has endorsed the updated CEI which is Guelph's commitment to use and manage energy differently moving forward. The main goal of the CEI is for Guelph to become a Net Zero Carbon community by 2050. The CEI is led by Our Energy Guelph (OEG), a not-for-profit organization that is intended to act as the City's CEI delivery partner with the goal of community influence to reduce energy consumption, save energy dollars, increase local economic benefit from energy spending, and reduce GHG emissions.

The updated CEI includes the following technical actions relevant to new construction:

- Incrementally increase the number of net zero new homes to 100% by 2030.
- Incrementally increase the number of non-residential buildings that achieve Passive House levels of performance to 100% by 2030.

It is anticipated that OEG will work toward these goals by:

- a. Creating advisory groups on residential new construction, ICI new construction, and community/neighborhood/urban planning
- b. Building Net Zero Carbon capacity in the local property development and building construction sector (information sharing, best practices, etc.)
- c. Advocating for changes in the Ontario Building Code / National Building Code
- d. Stimulating demand for Net Zero new construction through awareness and outreach campaigns to the home-buying public.

Through established policies and procedures, municipalities are required to support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and climate change adaptation through land use and development. However, the current planning and development approvals process does not require new construction to comply with Net Zero Carbon development or specific sustainable building construction methods. However a number of current resources have been reviewed with the purpose of identifying potential tools for municipalities to utilize to facilitate net zero carbon through development applications.

Context continued

Key sources of information used to identify and assess the potential tools are as follows:

- [FCM/GMF Feasibility Study: Municipal Tools for Catalyzing Net-Zero Energy Development](#)

The Federation of Canadian Municipalities (FCM) is a national non-profit organization consisting of members from municipalities across Canada. The Green Municipal Fund (GMF) is a unique FCM program that provides low-interest funding and knowledge services to support sustainable community development in Canada including improving air, water, and soil quality, and to mitigate the impacts of climate change. The above noted study focused on exploring technical, financial, or process/policy related barriers and possible solutions for municipalities to help motivate and enable the development community to adapt to net zero energy construction.

- Clean Air Partnership's Clean Air Council Green Development Standards Workshop

Clean Air Partnership is a charitable environmental organization with the mission to help municipalities minimize GHG emissions and to become sustainable communities. In coordination with over 30 Southern Ontario municipalities a Green Development Standards Workshop was held in November 2018 to work collaboratively and advance Green Development Standards.

- [Presentation from webinar by the Security and Sustainability Forum \(SSF\) on Climate Action Planning](#)

The Security and Sustainability Forum is a US-based organization is promoting knowledge sharing on climate action matters. They offer free webinars that convene global experts on a variety of topics including food, water, energy and climate for the purpose of information sharing and promoting clean energy and solutions to protect the environment. The above noted webinar held in August 2019 was focused on Creating Low Carbon, Resilient Communities.

Through the research and literature review, a number of potential tools were identified, summarized and assessed that could be utilized through the processing of development applications, including Official Plan Amendments, Zoning By-law Amendments, Plans of Subdivision and Site Plan Approvals. The tools were analyzed based on the following criteria:

- Level of municipal influence
- Potential net zero carbon impact
- Financial impact
- Available examples from other municipalities

Table 1, included as Attachment 2 to Report IDE-2020-14, provides the list of identified potential tools and associated analysis. A summary of the most promising tools, based on the analysis, is provided below:

- a) Consider establishing a Community Improvement Plan (CIP) focused on incentivizing net zero carbon development. Numerous examples of financial incentives were identified, particularly in jurisdictions such as Ontario, where municipalities are limited in what they can mandatorily impose through development approvals, and where there are legislated limitations regarding financially `bonusing` development. The most common tool used to design and deliver a package of financial incentives aimed at facilitating specific municipal policy objectives is a CIP enacted under the *Planning Act*. The City has extensive experience with CIP's through the Brownfield Redevelopment and Downtown CIP's.
- b) Encourage and recognize excellence in net zero carbon development and building projects through an awards and recognition program. Publicly recognizing positive examples of net zero development and new construction in the City is one way of promoting voluntary innovation. The City's Urban Design Awards program that is being re-launched in 2020 includes criteria associated with innovation in sustainable development, including net zero carbon measures.

- c) Develop net zero carbon development guidelines. A number of municipalities have developed guidelines or standards to help facilitate or encourage more “sustainable” development patterns. These can include a compilation of relevant best practices, model green development or building standards, and a listing of available resources and funding programs. These types of guidelines are generally used as a resource to help staff and development proponents explore opportunities through development applications.
- d) Feasibility Study Grant can provide an incentive for a developer to consider alternative energy measures in the development. Funding from the municipality or other entity would pay the developer for a study that considers alternative energy solutions that could include district energy or other technologies that would achieve a Net Zero Carbon standard.
- e) Development Charge Reductions/Exemptions/Rebates as a means to incentivize developers and builders to adapt to net zero construction methods.
- f) Tax increment based grants that allow deferral of taxes incrementally to encourage the redevelopment of sites with significant development costs and are paired with specific net zero building requirements.
- g) Advocate for change in Provincial planning policies and regulation that include mandatory adoption to Net Zero Carbon development standards.

Attachment 4 - Table 1: Summary of Potential Tools

Table 1: Review of Potential Tools to facilitate Guelph's Net Zero Carbon targets through Development Applications

Note: "Development Applications" includes: Official Plan Amendments, Zoning By-law Amendments, Plans of Subdivision and Site Plan Approvals)

Note: with respect to Level of Municipal Influence, "Direct" means that single tier municipalities in Ontario currently have specific legislative authority to implement the tool, and "Indirect" means that there isn't specific legislative authority enabling use of the tool, but single tier municipalities could voluntarily opt to develop such a tool to indirectly encourage, support or facilitate lower carbon development.

Note: this is a high-level initial evaluation and a more detailed evaluation, such as a business case/cost benefit analysis, may be required, if the City were to pursue specific actions with higher financial implications.

Potential Tool	Level of Municipal Influence	Potential Net Zero Carbon Impact	Financial Impact	Example	Notes
Community Improvement Plan (CIP) a plan to implement policy initiatives towards a specific project area with funding/financial incentives	Direct	Moderate to High, depends on outcomes of CIP	High, depends on specific plan attributes	Kitchener (CIP: Energy & Water Efficiency for Land and Buildings), City of Guelph Downtown CIP for sustainable design elements	Further review needed; outcomes depend on scope and potential incentive programs undertaken. FCM developed a framework that municipalities are currently refining.

Potential Tool	Level of Municipal Influence	Potential Net Zero Carbon Impact	Financial Impact	Example	Notes
Development Approvals	Direct	Low to High, depends on level of developer uptake	Limited to municipality. Can impact cost of development	All municipalities follow Planning Act development approvals processes	Relevant CEI Update elements could be integrated into different process steps, as applicable
Our Energy Guelph Activities	Indirect	Low to High, depending on outcomes	To be determined (depends on specific activity)	Guelph has established a service agreement with OEG	OEG work plan includes certain items related to development and construction that the City could participate in
Awards and Recognition Program	Indirect	Low	Low	Waterloo, Vaughan, Canadian Green Building Council	Could be coordinated together with Urban Design Awards

Potential Tool	Level of Municipal Influence	Potential Net Zero Carbon Impact	Financial Impact	Example	Notes
Green Building Standards	Indirect	Moderate	Moderate, depends on incentives	Hamilton, Brantford, Toronto, Halton Hills	Many municipalities have developed voluntary GBS, easier to implement, could standardize with other municipalities to measure performance on the path to net zero carbon guidelines
Feasibility Study Grant Incentive for developer to consider alternative energy measures	Direct (under CIP)	Moderate	Moderate	Further review needed	Municipality or other entity pays for the study for developer to consider alternative: i.e. district energy, other technology that would get them to a net zero carbon standard
Development Charge Reductions/Exemptions/Rebates Incentive programs for Developers and Builders	Direct	Moderate	Moderate to High	Not been used for energy to date. Cambridge used for rebates for Urban Agriculture Rooftop program	Further review needed, potential CIP outcome. Rebates generally considered best municipal tool because action has already been taken and is more measurable.

Potential Tool	Level of Municipal Influence	Potential Net Zero Carbon Impact	Financial Impact	Example	Notes
Tax Increment Based Grant Permits deferral of taxes incrementally to encourage the redevelopment of sites with significant costs associated (i.e. Brownfields)	Direct (under CIP)	Moderate to High – would need to be paired with specific net zero requirements	Moderate	Waterloo	Used frequently to incentivize brownfield redevelopment; potential CIP outcome
Building Permit Fee Reduction/Rebate	Direct	Moderate	Moderate	Ottawa, St Thomas, Welland	Further review needed, potential CIP outcome

Potential Tool	Level of Municipal Influence	Potential Net Zero Carbon Impact	Financial Impact	Example	Notes
Official Plan, Secondary Plan and Zoning Best Practices Implemented	Direct	Low to high	Low	Many Official Plans contain climate change/low carbon policies	Could be considered through the current Comprehensive Zoning By-law Update, next OP update and Secondary Plans. The Official Plan/ Secondary Plans have high potential to address sustainable development patterns at a land use/urban form/infrastructure planning level. But Official Plan policies and zoning regulations have limited ability to directly regulate/mandate low carbon construction based on Provincial legislation
Green Roof Program	Indirect	Moderate; potential energy and infrastructure savings	Moderate	Toronto	Further review needed of potential costs and benefits of a voluntary or incentivized program.

Potential Tool	Level of Municipal Influence	Potential Net Zero Carbon Impact	Financial Impact	Example	Notes
Expedited Development Approvals – prioritize review of developments that promise to be net zero	Indirect	Low	Moderate	Further review needed	<p>Application processing times are only partially controlled by the municipality (i.e. the portions of the process related to City review) but other elements are less under municipal control (i.e. developer-led portions of the process, involvement of external agencies). Timelines set out in Planning Act are already very tight and it would be difficult to expedite further. It is also not possible at building permit to require construction standards that exceed the Ontario Building Code (i.e. net zero carbon standards).</p>

Potential Tool	Level of Municipal Influence	Potential Net Zero Carbon Impact	Financial Impact	Example	Notes
Advocate for stronger provincial planning policies/legislation related to net zero carbon development and enhanced Ontario or National Building Code for net zero construction standards	Indirect	Low to High (depending on outcomes of advocacy)	Low	Stronger Provincial Policies, regulations for Net Zero in PPS and Planning Act and changes to Ontario Building Code	Guelph could leverage its involvement in larger municipal advocacy efforts, such as through the Association of Municipalities of Ontario (AMO) and the Federation of Canadian Municipalities (FCM).

Information Report



Service Area	Infrastructure, Development and Enterprise Services
Date	Friday, January 10, 2020
Subject	Prosperity 20Next - Guelph's Next Economic Development Strategy Update
Report Number	IDE-2020-11

Executive Summary

Purpose of Report

This report summarizes the work completed on the City's new Economic Development Strategy and Implementation Plan and provides information on the next steps of the project.

Key Findings

The first phase of the new Economic Development Strategy is now complete. The deliverables for this initial phase included an economic base analysis and environmental scan. Specifically, the economic outlook as well as local, national and global industry and market trends; policy and strategy influences of higher levels of government; Guelph's current business support ecosystem and other factors influencing Guelph's local economy now and into the future were examined. This work lays the foundation to complete Phase 2 and 3 of the project. The project is on schedule and is expected to be completed in May 2020, with the final strategy and a report presented to Council for endorsement in Summer, 2020.

Financial Implications

The creation of Guelph's new economic development strategy is funded through the Capital Budget PN0707. This project is currently within budget.

Report

Details

As the City of Guelph enters the final year of its Economic Development Strategy – Prosperity 2020, the City's Business Development and Enterprise Services (BDE) Department is charged with renewing this strategic plan. The strategy will provide City staff with strategic directions and a road map to implement actions that will continue to advance Guelph's position as a competitive and prosperous location for private and public sector investment. It will support the growth and diversification of Guelph's economic sectors and the goals and vision of the City's new Corporate Strategy.

The City has engaged the Global Investment Attraction Group (GIAG) to assist in the development of Guelph's new five-year Economic Development Strategy. This strategy will establish the strategic directions and framework to help guide economic development priorities, programs and initiatives of the City. It will align with the City's Strategic Plan as well as other corporate strategies and City Master Plans. It will also take into consideration the programs and strategies of our local, regional, national and international economic development partners to identify and create alignment where possible.

The next Economic Development Strategy will include an implementation plan to inform work plans and budgets for the City for the next five years and will assist staff in setting the strategic directions, priorities, programs and key performance metrics as it relates to economic development.

The following report will summarize the work completed and yet to be completed on the City's new Economic Development Strategy and Implementation Plan.

The Strategy

The purpose of a new economic development strategy is to:

- Provide strategic directions, priorities and an implementation plan along with key performance metrics to advise BDE and other City departments' annual work plans where economic development can be supported or influenced
- Create alignment across City departments and with external stakeholders, economic development partners and organizations involved in the renewal of the economic development strategy

The economic development strategy will be completed in three phases:

PHASE 1: Economic Base Analysis and Review of Prosperity 2020

- Economic Base Analysis – Economic, labour and sector analysis
- An environmental scan of strategies and policies that would influence the economic development strategy for the City
- Economic Outlook – local, regional, national, international
- Review, assess and summarize the outcomes/achievements of Prosperity 2020
- High level assessment of employment lands, real estate and infrastructure (hard and soft services)

PHASE 2: Economic Development Review, Assessment and Engagement

- Complete a SOAR Analysis (Strengths, Opportunities, Aspirations, and Results)
- Best practice review of other community EDO structure/resources/advisory committees (up to 5 comparator)
- Review current staff, projects and financial resources, roles, responsibilities and advisory committee requirements for BDE

PHASE 3: Development and Completion of Strategy and Implementation Plan

- Identify strategic directions, sectors and priorities
- Identify annual BDE programs of work including an assessment and validation of required resources and roles to implement the 5 year plan with KPIs, budgets and method(s) of reporting/communicating

- Evaluation of BDE advisory committees and their requirements/relevancy to help implement the renewed strategy, including recommendations on changes needed
- A final strategy and implementation plan report

Beginning in August 2019 the consulting and staff teams developed a community engagement plan for the strategy. This plan is consistent with the [City's Community Engagement Framework](#). The engagement plan involves consultation with a comprehensive list of stakeholders using established principles and objectives and defined tactics and tools. It also aligns with the engagement-related work conducted through other City master plans. Consultations include the business community of all sizes and sectors, industry associations, economic development and community support agencies and partners, academic institutes, City Council, cross-departmental staff, and representatives from both provincial and federal governments charged with economic development related portfolios.

Phase 1 is now complete. The objective for Phase 1 work was to collect primary and secondary data and conduct research to complete and develop baseline data for the strategy. This included an economic base analysis; identification of market and industry trends and research on other local, regional, national and international economic development partners and programs; and a collection of data and statistics of Guelph and comparator communities including Kitchener, Waterloo, Cambridge, London and Hamilton. The engagement tactics used were mainly interviews (telephone calls and face to face) with staff and other key economic development support partners in the region to help understand Guelph's current economic climate and ecosystem.

The consultant has presented staff with a summary of Phase 1 findings for the background work and economic base analysis. These findings will be used as a foundation on which the next phases of the project can build on. These findings will become part of the final strategy document that is expected to be completed in May 2020 and will be presented to City Council for endorsement by the end of Q2-2020.

Phase 2 work will begin in January 2020. This phase will be used to gather insights and ideas from the target audiences, as described above, using the SOAR (Strengths, Opportunities, Aspirations, Results) model of appreciative inquiry. This information will help inform and shape the City's next Economic Development Strategy and create a shared vision for future aspirations and the results they will bring. Engagement tactics will consist of a combination of round tables, on-line surveys and telephone calls. Phase 2 is expected to be complete by the end of February/early March 2020.

Upon completion of Phase 2 work, Phase 3 will begin. This phase will focus on creating the final strategy and implementation plan using the information and data collected in the first two phases. The final strategy will provide City staff with strategic directions, priorities and a road map to implement actions that will continue to advance Guelph's position as a competitive and prosperous location for private and public sector investment. It will support the growth and diversification of Guelph's economic sectors and align with the goals and the vision of the City's new Strategic Plan.

Financial Implications

Funding for the development of Guelph's new Economic Development Strategy will be \$78,000 and is funded through the Capital Budget PN0707.

Consultations

As described above, a community engagement plan has been prepared to include consultations with Guelph's businesses of all sizes and sectors, industry associations, business and community support agencies and partners, academic institutes, City Council, cross-departmental staff, and representatives from both provincial and federal governments charged with economic development related portfolios. Consultation methods include variety of tactics such as round table discussions, on-line surveys, face to face and telephone interviews

Strategic Plan Alignment

The Economic Development Strategy will provide strategic directions and a road map to achieve the shared vision of the City's Strategic Plan. Specifically, it will support and align with the Powering Our Future priority – an economy that empowers us, contributes to a sustainable, creative and smart local economy connected to regional and global markets, and supports share prosperity for everyone.

Attachments

None

Departmental Approval

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Information Report

Service Area	Infrastructure, Development and Enterprise Services
Date	Friday, January 10, 2020
Subject	York Road/Elizabeth Street land use study and urban design concept plan
Report Number	IDE-2020-02

Executive Summary

Purpose of Report

The purpose of this report is to inform Council that staff have initiated the York Road/Elizabeth Street land use study and urban design concept plan.

Key Findings

The York Road/Elizabeth Street land use study and urban design concept will help develop a coordinated land use strategy for the study area and urban design concept plan that includes a built form and public realm framework. This project will coordinate with the strategic goals of higher order plans and policies such as the Provincial Policy Statement and the Growth Plan for the Greater Golden Horseshoe as well as inform the municipal comprehensive review and Official Plan update.

Financial Implications

The York Road/Elizabeth Street land use study and urban design concept plan is funded through approved capital budgets.

Report

Details

The proposed boundary for the York Road/Elizabeth Street study area runs along York Road from Stevenson Street South (captures part of Johnson Street), to Watson Parkway south, all bounded by the CNR rail line to the north. The plan area will also include the south side of York Road between Stevenson Street and Victoria Road (see Attachment 1). York Road from Victoria Road to the east plan boundary is identified in the Official Plan as an [Intensification Corridor](#), which is planned to provide for mixed-use development in proximity to transit services at appropriate locations. Intensification corridors are also planned to achieve:

- i) Increased residential and employment densities that support and ensure the viability of existing and planned transit service levels;
- ii) A mix of residential, office, institutional, and commercial development where appropriate; and

A range of local services, including recreational, cultural and entertainment uses where appropriate (OP 3.10.2)

Creating a plan for the York Road area to review the function, design and character of the corridor is also a priority action from the [Urban Design Action Plan](#). The majority of the area is designated as [industrial](#), [service commercial](#) and [mixed business](#) with a variety of uses including manufacturing, used car dealerships, restaurants, residential, auto repair and scrap yards.

The York Road/Elizabeth Street land use study and urban design concept plan will develop a coordinated approach to land use planning and urban design in a heterogeneous area. The study will:

- Review the context and history of the area and conduct a land use compatibility study for noise, dust, light, odour, air quality and vibration impacts on the York Road/Elizabeth Street area. It will examine the study area as it relates to the Ministry of the Environment (MOE) requirements such as the Guideline D-6 (Compatibility Between Industrial Facilities and Sensitive Land Uses). The land use compatibility study will also review the impacts of the existing railways and the Guelph Noise Control Guidelines.
- Develop a land use strategy that considers the following:
 - the York Road, Victoria Street and Stevenson Street frontages
 - transition between residential and non-residential uses
 - appropriate land uses along the rail corridor
 - identifying larger scale redevelopment and intensification opportunities
 - defining the Employment Area for the plan area
 - examining the mixed business, service commercial and special study area land use designations
- Develop an urban design concept plan that considers the following:
 - Built form framework including addressing transitions
 - Public realm framework including conceptual street cross-sections
 - 3D model for the York Road, Victoria Street and Stevenson Street frontages
- Provide a plan that respects the natural and cultural heritage of the area and engages with stakeholders and residents

The study is intended to develop a coordinated approach for the land in this area to inform Guelph's Official Plan update and Growth Plan conformity exercise. This project will be iterative with the Municipal Comprehensive Review. In particular, it will include:

- recommendations for potential employment land conversion to inform the Employment Lands Strategy;
- recommendations for land use changes;
- estimated yield of people and jobs; and
- directions for changes to the urban structure for the area.

This project will also consider other ongoing projects and inputs, which include the Commercial Policy Review Official Plan Amendment and York Road Environmental

Design Study. The IMICo lands (5.2 ha brownfield property at 200 Beverley Street) is also within the study area.

Financial Implications

The York Road/Elizabeth Street land use study and urban design concept plan is funded through approved capital budgets.

Consultations

A variety of techniques will be used to reach a broad cross-section of stakeholders. Techniques may include a bus tour, workshops, and online engagement.

Strategic Plan Alignment

The York Road/Elizabeth Street land use study and urban design concept plan will support the City's existing policies and guidelines and align with the following priorities within Guelph's Strategic Plan:

- Powering our future – This study will support a healthy economy.
- Navigating our future – The study will consider transportation connectivity, safety and improving connections to workplaces in Guelph.
- Building our future – By prioritizing policy work that supports the development of new assets this study will respond to Guelph's growing and changing social, economic and environmental needs.

Attachments

Attachment-1: Project Boundary Map

Departmental Approval

Not applicable

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Attachment 1 – Study Area Boundary



Provincial and Federal Consultation Alert



Amendment to the Record of Site Condition (Brownfields) Regulation related to the Requirement to Sample Ground Water

Ministry

Ontario Ministry of Environment, Conservation and Parks

Consultation Deadline

13 January 2020

Summary

Ontario is proposing to amend brownfields-related regulations under the *Environmental Protection Act* to allow qualified persons to determine the need or lack thereof for ground water testing under certain circumstances during the Record of Site Condition process.

Proposed Form of Input

Written submission on the Environmental Registry of Ontario.

Rationale

City staff are analysing the regulatory proposal to determine impacts and to advance City of Guelph interests.

Lead

Engineering and Transportation Services with support from Environmental Services.

Link to Ministry Website

<https://ero.ontario.ca/notice/019-0987>

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Provincial and Federal Consultation Alert



Discussion Paper: Public Health Modernization

Ministry

Ontario's Ministry of Health

Consultation Deadline

10 February 2020

Summary

The Ministry of Health is holding consultations on transforming Public Health Services across Ontario to inform provincial decision-making on public health service delivery and restructuring. A discussion paper has been posted online alongside a survey that is open for public input.

Proposed Form of Input

That the City of Guelph respond to the Ministry's discussion paper survey, write a letter with interested partners to Municipal Advisor Jim Pine and prepare to participate in in-person consultations should a session be held in the region.

Rationale

The City of Guelph is a co-funder of the Wellington-Dufferin-Guelph Public Health Unit and has representation on the Board of Health.

Lead

Finance/Intergovernmental Services

Link to Ministry Website

http://health.gov.on.ca/en/pro/programs/phehs_consultations/docs/dp_public_health_modernization.pdf

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Provincial and Federal Consultation Alert



Discussion Paper: Emergency Health Services Modernization

Ministry

Ontario's Ministry of Health

Consultation Deadline

10 February 2020

Summary

The Ministry of Health is holding consultations on modernizing municipal land ambulance services. A discussion paper has been posted online alongside a survey that is open for public input.

Proposed Form of Input

That the City of Guelph respond to the Ministry's discussion paper survey, write a letter to Municipal Advisor Jim Pine and prepare to participate in in-person consultations should a session be held in the region.

Rationale

Any provincial reforms arising from the consultation will have a direct impact on the finances and operations of Guelph-Wellington Paramedic Services.

Lead

Public Services - Guelph Wellington Paramedic Services

Link to Ministry Website

http://health.gov.on.ca/en/pro/programs/phehs_consultations/docs/dp_emergency_health_services_modernization.pdf

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Provincial and Federal Consultation Alert



Ontario 2020 Budget Consultations

Ministry

Ministry of Finance

Consultation Deadline

11 February 2020

Summary

The Ministry of Finance is holding public pre-budget consultations in advance of the 2020 Ontario Budget.

Proposed Form of Input

Written submission.

Rationale

These consultations provide an opportunity for the City of Guelph to provide input into the development of the Budget that will guide Ontario's finances and fiscal decision-making in the 2020/2021 provincial fiscal year. The City has an interest in advocating for a fiscal approach from the province conducive to the City's financial wellbeing and continued growth.

Lead

Intergovernmental Services

Link to Ministry Website

<https://www.ontario.ca/page/2020-budget-consultations>

Contact Information

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Future-proofing our buildings through energy efficiency retrofits

Report to Guelph City Council January 2020



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Executive Summary

The world is facing a climate crisis. Emissions of greenhouse gases (GHGs) must be reduced dramatically to avoid a global catastrophe.

Canada's emissions per person are 4th in the world¹. It is the solemn responsibility of each community to curb their own contribution to the problem, as City Council acknowledged in May 2018 by endorsing the goal of making Guelph a Net Zero Carbon community by 2050².

Residential and commercial buildings contribute nearly half of our emissions by burning natural gas for space heating and domestic hot water supply. These emissions can be curtailed through energy efficiency retrofit projects, which reduce energy consumption through energy efficiency, and switch to non-emitting fuels.

The biggest barrier to energy efficiency retrofit projects is financing. The most promising solution of the seven that were reviewed is Property-Assessed Clean Energy (PACE), which attaches financing to the property, rather than the property owner, through the tax roll. The program was previously introduced to Council as the Guelph Energy Efficiency Retrofit Strategy (GEERS).

This report builds on prior work, but proposes to minimize municipality's role to the bare minimum necessary. The bulk of the program will be performed by a 3rd party delivery agent. Other parties will play key roles, including investors, contractors, utilities, and property owners, with each party deriving specific benefits from their involvement. The program poses risks specific to each participant, but various measures are proposed to mitigate these risks.

By moving ahead with GEERS, our community will make our building stock more energy efficient, more valuable, more comfortable, and more resilient. We will also significantly reduce our contribution to the global climate change crisis.

¹ <https://www.ucsusa.org/resources/each-countrys-share-co2-emissions>. Data from 2016.

²

<https://guelph.ca/2018/05/council-unanimously-accepts-energy-guelphs-community-energy-recommendations/>

Introduction

Climate change is rapidly becoming the central issue of our time. The Intergovernmental Panel on Climate Change published a special report in October 2018 laying out in stark detail the implications of global warming of 1.5 °C above pre-industrial levels³. Climate emergencies have been declared by countries like Canada, Portugal, Ireland and France, and in individual cities such as Paris, New York, Toronto and Vancouver. On May 28, 2019, Guelph City Council has passed a motion acknowledging the climate crisis⁴. On November 5, 2019, more than 11,000 scientists signed a declaration of a climate emergency in the journal *Bioscience*⁵.

The update to Guelph's Community Energy Initiative, presented to Council in May 2018, showed that the municipality does not have the luxury of leaving the climate challenge to other orders of government and to the marketplace. If it were to choose to do so, greenhouse gas (GHG) emissions in 2050 would be essentially the same as they are today; while broad advances in energy efficiency are anticipated, population growth would almost completely eclipse them⁶. Against this backdrop, Guelph City Council endorsed the target of making Guelph a Net Zero Carbon community by 2050.

By taking this important step, Council acknowledged that our community-wide GHG emissions are contributing to the global climate crisis. Council further acknowledged that our community must act. If we rely on the marketplace and other orders of government to deliver climate solutions, our community-wide emissions will remain static - any improvements in efficiency will be eclipsed by growing population. Finally, Council acknowledged the clearly- expressed desire of our community for Guelph to continue its leadership role on climate action, by taking aggressive steps to drive GHG emissions down.

³ <https://www.ipcc.ch/sr15/>

⁴ https://guelph.ca/wp-content/uploads/council_minutes_052719.pdf#page=15

⁵ <https://www.cbc.ca/news/technology/scientists-declare-climate-emergency-1.5347486>

⁶ <https://www.ourenergyguelph.ca/downloads/baseline-and-business-as-usual-report.pdf#page=5>

One year later, Our Energy Guelph (OEG) presented Council with a roadmap to achieve that target: The Pathway to Net Zero Carbon⁷. This Pathway contained two surprises, both in contrast to public discourse which assumes massive taxpayer-funded expenses will be required to address climate change. First, eliminating Guelph's GHG emissions will result in a substantial net economic benefit of \$1.7B (in present dollar terms) and the addition of 1,300 jobs. Second, the Pathway offers an Internal Rate of Return (IRR) of nearly 9%⁸, making it an attractive investment opportunity for private sources of financing, and rendering public sector capital contributions unnecessary.

Of the 25 actions in the Pathway, three involve retrofitting existing buildings to improve energy efficiency (EE). A further five actions can be enabled using the same basic approach. Together, these eight actions account for 61.5% of the annual greenhouse gas emissions (GHG) reductions required to meet the target⁹. This document proposes a program to deliver these eight actions.

The CEI update of May 2018 also reported on progress toward two key goals from the original Community Energy Initiative, namely to reduce GHG emissions by 60% and energy consumption by 50%¹⁰. The community was on track to achieve the former target, but due to actions taken provincially rather than locally (i.e. the elimination of coal-fired generation from the provincial electricity supply). The city was far from achieving the latter target (2% compared to the 20% reduction that would have been expected by 2016 assuming linear progress)¹¹. Achieving the new Net Zero Carbon goal will require significant reductions in energy consumption, and these can only be

⁷ <https://www.ourenergyguelph.ca/pathway-to-net-zero-carbon>

⁸

<https://www.ourenergyguelph.ca/downloads/ssg-phase-2-report-the-pathway-to-net-zero-carbon.pdf#page=8>

⁹

<https://www.ourenergyguelph.ca/downloads/ssg-phase-2-report-the-pathway-to-net-zero-carbon.pdf#page=35> Actions 3, 4, 5, 7, 8, 9, 12, and 21 account for 578 out of 940 kT CO₂e.

¹⁰ Both targets with respect to 2006 levels, to be achieved on a per-capita basis by 2031.

¹¹

<https://www.ourenergyguelph.ca/community-energy-initiative-cei-update-2018/research-and-response/baseline-and-business-as-usual-report>

achieved through deep energy efficiency retrofits across all of the city's building stock.

How do buildings use energy?

Energy allows buildings to be comfortable, safe, and useful. Heating (including hot water), cooling, humidity control, and ventilation make buildings comfortable and avoid risks to human health. Lighting makes it possible to see what you're doing, whether that's moving around or performing tasks. Electrical outlets supply power to devices that make life easier, including refrigerators, dishwashers, clothes washers and dryers, televisions, computers, and smartphones.

Natural gas is used for space and water heating, and in some cases cooking food and drying clothes. Electricity can provide these services, as well as everything else mentioned above. Diesel fuel is used for backup generators, although natural gas is another option.

Why does building energy efficiency matter?

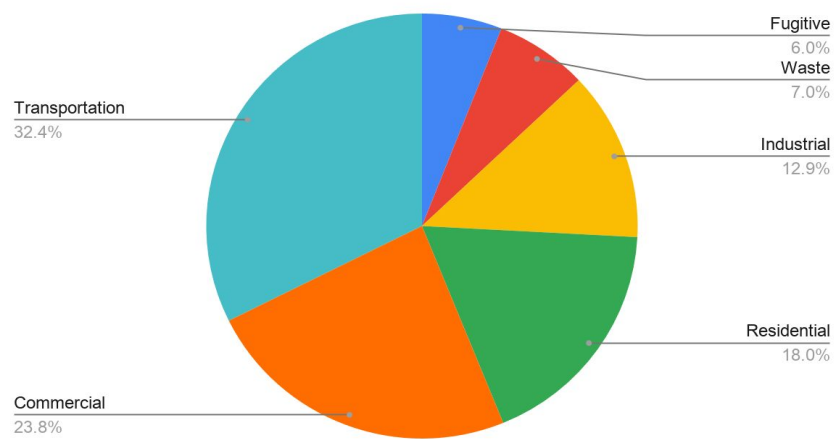
If a building is not efficient, it is wasteful. Wasted energy results in unnecessary GHG emissions and exposure to fluctuating energy costs. Inefficient buildings are also less comfortable, noisier, and can have bad health effects for occupants. They are more dependent on externally-supplied energy, making them less resilient.

Buildings emit GHGs

When buildings use energy, that energy can produce GHG emissions. These emissions could be onsite, such as the carbon dioxide that is given off when natural gas is burned in a residential water heater. They could also be “upstream”, meaning emissions that are produced in the process of generating energy and transporting or transmitting it to the building. An example of this is when natural gas is burned in so-called “peaker plants” (like the one on the north side of Highway 401 in Milton). Emissions can also be “embodied”, meaning that they happened during the original manufacture and shipping of the materials that make up the building as it was being constructed.

Together, residential and commercial buildings are responsible for nearly half (41.8%) of our community-wide GHG emissions¹². The chart on the right shows how each sector contributes to our emissions.

Guelph community-wide emissions by sector



An inefficient building emits more GHGs than an efficient one. By making our buildings more efficient, we can reduce their contribution to GHG emissions and hence to global climate change.

Energy costs can fluctuate wildly

Prudent homeowners live within their means, and use a budget to keep finances on track. The same goes for business owners. When a particular budget item is subject to large and unpredictable price movements, it wreaks havoc. The more exposed a home or business is to price swings, the more necessary it is to have a financial cushion - a reserve, or a line of credit - to deal with unexpected cost increases.

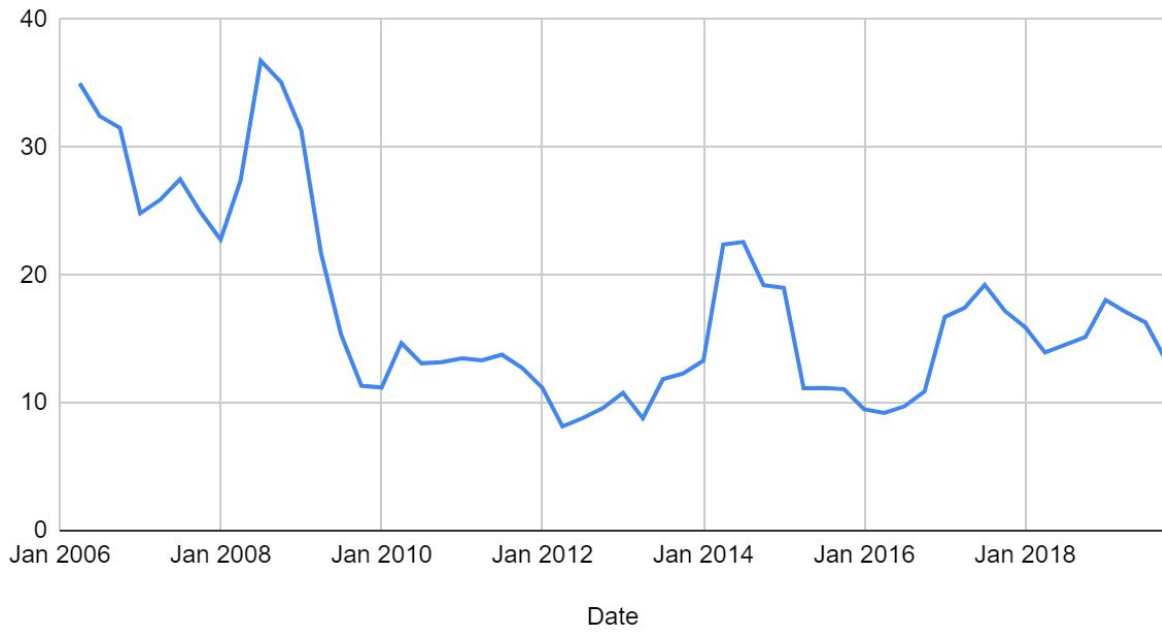
Ontario energy prices are regulated, so they don't tend to change much from month to month, especially for homes and small businesses. Larger businesses, such as medium to heavy industry, pay market rates that can vary dramatically over time (especially considering the impact of the so-called Global Adjustment). The chart below illustrates how much natural gas prices have fluctuated since 2006. For example, from July 2008 to October 2009 a recession combined with a dramatic increase in production caused the price to drop nearly 70%; by contrast, from April

¹²

<https://www.ourenergyguelph.ca/downloads/baseline-and-business-as-usual-report.pdf#page=14>

2013 to July 2014, the Polar Vortex extreme cold event caused the price to increase 70%. Price swings like these can wreak havoc on personal and business finances.

Natural gas commodity price (¢/m³)



Energy-efficient buildings are less exposed to fluctuating energy prices. This makes it easier to budget for energy costs, and makes it less important to keep a “rainy day fund” to deal with the unexpected.

Leaky buildings are uncomfortable, unhealthy, and noisy

Inefficient buildings usually have a leaky outside shell, referred to as the “building envelope”. Cracks around windows and doors, as well as baseboards and electrical outlets on outside walls, provide pathways for air to move in and out of the building. That makes it harder to keep the inside at a comfortable temperature, so the furnace or air conditioner needs to consume more energy to offset the air that leaks out. It also means that some parts of the buildings are drafty. Sitting by the window of a century home may offer a nice view, but it probably also means a chilly draft in wintertime. In a well-insulated home, you can be as comfortable in a chair by the window as in bed under a quilt.

Cold spots on outside walls can cause worse problems than discomfort. They can get chilly enough to reach the dew point, and moisture can start to build up. That moisture can lead to problems like mold and mildew, which in turn can cause health issues like respiratory illnesses.

Finally, thin and poorly-insulated walls aren't very soundproof. If you live in a noisy neighbourhood, and your house doesn't have good insulation, you'll hear all kinds of things that you wouldn't hear in an efficient, well-insulated house. This can be more than irritating - it can interfere with sleep, which can lead to all manner of health problems.

By contrast, well-insulated, efficient homes offer comfort, health, and quiet.

Inefficient buildings are less resilient

Extreme weather events like flooding, high winds, ice storms, and heat waves are becoming more frequent. These events can cause power outages that disable heating and cooling equipment. A building can only remain livable for a certain period of time when this happens. This period of time depends on how energy efficient the building is - specifically, how well the building envelope keeps heat out during summer and warmth in during winter.

A less efficient building with a leaky envelope will rapidly become unlivable when its energy supply is interrupted. Hence, occupants of less efficient buildings are more likely to be forced to vacate their building and seek shelter elsewhere - likely in a municipal warming or cooling centre, such as a recreation centre. This increases the burden on municipal resources during an emergency and makes it less likely that the community can weather the storm without calling on outside help.

Conversely, a more efficient building with a better envelope will remain livable for a longer period of time.

What's included in an EE project?

EE retrofit projects typically include improvement or replacement of the following measures in their scope:

- Attic, wall, and basement insulation
- Weather stripping
- Windows (ideally triple glazed)
- Furnace
- Air conditioner
- Water heater
- Smart thermostat
- Drain water heat recovery

While not strictly speaking considered EE measures, the following may also be included:

- Water efficiency systems, such as grey water recovery or rainwater harvesting
- Rooftop solar systems (photovoltaic electricity generation, or solar hot water)
- Electric Vehicle Supply Equipment (i.e. electric car charger)
- Re-roofing (raised seam steel roofing, steel architectural tile, or ceramic tile)

History

The idea of renovating a building to make it more energy efficient is not new, but it received a big push from the two energy crises of the 1970s. These events, and the resulting sharp increases in energy prices, prompted property owners and builders to reduce their dependence on imported heating oil by making their buildings more efficient. Lower energy prices in the 1980s led to reduced interest. More recently, concerns about climate change have revived the EE market. An example is the EcoEnergy for Homes program of 2007-2012, which stimulated adoption of EE retrofits in Canada.

PACE in the US

One of the most significant transformations to the EE retrofit industry has resulted from the Property Assessed Clean Energy (PACE) program in the United States. 20 states have implemented PACE programs, allowing property owners to make EE investments in their buildings and repay the capital cost on their property tax bill over an extended period of time. Since the inception of the program over ten years ago, US\$5.6 billion has been invested in residential properties and US\$1.1 billion in the industrial, commercial, and institutional (ICI) sector according to the advocacy group PACENation¹³.

PACE loans have two significant benefits that distinguish them from other options:

1. **Lower default rate.** Properties with PACE loans have a lower property tax default rate than properties without them¹⁴.
2. **Resale premium.** Properties with PACE loans command a premium on resale of the property that is over and above the value of the loan. In other words, the PACE project increases the value of the property by an amount higher than the cost of the project. This is in contrast to other renovation options, which see property value increases lower than the cost of the project¹⁵.

Solar City in Halifax

Launched in 2013, the Solar City program¹⁶ has had considerable success with promoting the installation of rooftop solar energy systems, including both solar hot water and solar electric (photovoltaic) technologies. Solar City uses a similar financing approach to PACE.

Other municipalities in Nova Scotia, including Bridgewater and Digby, are at various stages of implementing PACE programs.

¹³ <https://pacenation.org/pace-market-data/>

¹⁴

<https://www.pacenation.org/wp-content/uploads/2018/04/DBRS-Residential-PACE-Delinquency-Trends.pdf>

¹⁵ https://www.paceab.ca/resources/05_PACE_Impact_on_Home_Real_Estate_Value.pdf

¹⁶ <http://poweredbycommunities.ca/index.php/2019/10/21/property-assessed-clean-energy/>

Local Improvement Charges in Ontario

An amendment to provincial legislation passed in 2012 allows a municipal finance tool called Local Improvement Charges (LICs) to be used on a voluntary basis for energy and water efficiency retrofit projects on private property. This amendment was inspired by the success of the US PACE program. The City of Guelph participated in the advocacy efforts that led to this amendment, through a collaboration led by the Clean Air Partnership called CHEERIO (Collaboration on Home Energy Efficiency Retrofits In Ontario)¹⁷.

HELP in Toronto

The Home Energy Loan Program (HELP)¹⁸, initiated in January 2014, uses PACE-type financing based on the LIC mechanism to enable EE retrofits. The program offers loans of up to \$75,000 and financing terms of up to 20 years. Capital is supplied from a City of Toronto reserve fund. A companion program, High-rise Retrofit Improvement Support (HI-RIS), targets multi-unit residential buildings. As of May 2019, the two programs had mobilized a total of \$14.9 million to deliver 202 retrofit projects. The average HELP loan amount is \$22,000, while the average HI-RIS loan is \$735,000¹⁹.

GEERS

The City of Guelph has been exploring ways to encourage EE retrofits for more than ten years:

Date	Event
2007	Guelph adopts the Community Energy Plan, which identifies EE retrofits as a tool to reduce community-wide energy consumption.

¹⁷ <https://www.cleanairpartnership.org/projects/cheerio/>

¹⁸

<https://www.toronto.ca/services-payments/water-environment/environmental-grants-incentives/home-energy-loan-program-help/>

¹⁹ <https://www.toronto.ca/legdocs/mmis/2019/ie/bgrd/backgroundfile-134697.pdf#page=7>

September 2015	Guelph Energy Efficiency Retrofit Strategy (GEERS) first presented to Council.
May 2016	GEERS presented to Council again, incorporating the changes that were requested in 2015.
2016-2018	GEERS is put on hold while the Community Energy Initiative (CEI) is updated.
May 2018	CEI Update is presented to Council, recommending GEERS or a similar program to reduce energy consumption of buildings.
May 2019	Pathway to Net Zero Carbon is presented to Council. EE retrofits comprise three of the 25 technical actions in the Pathway.

In response to the recommendations of the May 2018 CEI Update, a project was initiated in February 2018 to revise the GEERS proposal.

Engagement approach

The GEERS project employed an engagement approach consisting of two elements. The first was to convene a team of local stakeholders, while the second was to participate in a joint project with other municipalities (see CASC, below).

Stakeholder team

The stakeholder team included the following individuals:

Name	Organization	Constituency
Patrick Andres	City of Guelph	Building inspections
Gavin Baxter	SHED Design	Renovation contractors
Alex Chapman ²⁰	Our Energy Guelph	Guelph community
Ian Dunbar	Enbridge Gas	Natural gas utility
Don Eaton	Elora Environment Centre	Energy auditors
Evan Ferrari	eMerge Guelph Sustainability	Environmental NGOs

²⁰ Alex Chapman transitioned from the role of Manager, Climate Change Office with the City of Guelph to ED of Our Energy Guelph during the course of the mandate of the GEERS Advisory Group but served as chair throughout.

Andy Goyda	Owens Corning	Materials suppliers
James Krauter	City of Guelph	Finance
Mark Poste	County of Wellington	Social housing
Irene Szabo	Sutton Group	Realtors
Erik Veneman	Alectra Utilities	Electricity utility
Heather Yates	City of Guelph	Water utility

This advisory group met seven times over the course of the year, examining different aspects of the program and refining the recommended approach described in this document.

CASC

With funding support from the Federation of Canadian Municipalities Transition 2050 program, in 2019 the Clean Air Partnership launched the Climate Action Support Centre (CASC). This entity is supporting three work streams, one of which is assisting communities interested in implementing an EE retrofit program. Guelph provided a letter of support for the preparation of the initial application. CASC has delivered a series of webinars on this topic as part of this program.²¹

The financing barrier and how to overcome it

EE retrofit projects result in reduced consumption of electricity, natural gas, and possibly water. This leads to utility bill savings which serve to pay back the initial investment, but they don't do so very quickly. The typical residential EE project has a simple payback period of eight years²².

Coincidentally, the typical Canadian will stay in their home for eight years²³. Hence, the average homeowner would have to retrofit their home immediately after

²¹ <https://www.cleanairpartnership.org/projects/casc/>

²² http://guelph.ca/wp-content/uploads/IDE_agenda_090815.pdf#page=37

²³

https://mortgageproscan.ca/docs/default-source/default-document-library/a-profile-of-home-buying-in-canada.pdf?sfvrsn=e54ef47e_0

purchase to have a reasonable chance of repaying their initial investment before the house is sold again. This is likely to discourage many prospective customers.

If a property owner goes ahead with an EE project anyway, they have a number of possible ways to pay for it, including:

- Savings
- Home equity loan or line of credit
- Unsecured line of credit
- On-bill financing
- Utility incentives

These are discussed in more detail below.

Savings

EE retrofits compare rather well with other investment alternatives. They provide savings on after-tax income, whereas the interest earned on investments (e.g. a savings account, mutual funds, stocks, bonds, or Guaranteed Investment Certificates) is taxable in the investors hands. The eight-year simple payback period for the bundle of EE measures envisioned for a typical residential project (see *What's included in an EE project?* above) translates into an after-tax rate of return of 12.5%; such a rate of return is difficult to match on the stock market, let alone lower-risk investment options.

The problem is that most Canadians are heavily indebted. Few have savings available to invest in an EE project. Even if a property owner has capital to spare, EE projects are a highly illiquid investment; you can't cash out on demand as you can with, say, a high-interest savings account.

Home equity loan or line of credit

Canadians typically use this instrument to finance renovations like granite countertops, adding or improving a bathroom, or replacing flooring. (It can also be used for unrelated purposes like debt consolidation or post-secondary education

tuition.) Because the debt is secured by the property, the lender has the right to seize the property and sell it to recover their money if the borrower goes into default. Hence it is a comparatively low risk for the lender and they can offer an attractive interest rate.

Loans have strict terms for repayment, while lines of credit are more flexible. Flexibility can be both good and bad; it can lead to a lack of fiscal discipline, which results in a much longer time to pay off the debt than in the case of fixed payments. In both cases, means testing is used to determine if the borrower is an acceptable risk, and not all will pass that test; those that do will face limits on future borrowing as the debt is attached to the individual rather than the property. When the property is sold, the debt must be paid off.

Unsecured loan or line of credit

This option is similar in most respects to the previous item, except that the lender does not have the last-resort option of seizing an asset if the borrower defaults on their debt. As a result, the interest rate is considerably higher to compensate for the higher risk to the lender.

On-bill financing

Some utilities provide financing to help their customers to purchase energy-saving devices (e.g. replacing an old furnace with a new, high-efficiency one). The customer incurs little or no up-front cost, and they pay off the principal on their utility bill. Utilities have a comparatively low cost of capital and can therefore offer an attractive interest rate. However, they do not have the ability to seize the property or the asset, so the rate is typically higher than that available with a Home Equity Line of Credit. It is also difficult for the utility to force the new owner to assume the liability if the property changes hands.

Neither Alectra Utilities or Enbridge Gas currently offer any programs of this type.

Utility incentives

Electricity, natural gas, and (some) water utilities offer incentives for implementing measures that reduce consumption. These incentives are usually in the form of a rebate that is paid out after the measure is completed, thereby reducing the capital cost that must be repaid through the bill savings arising from reduced consumption. The programs may be “prescriptive”, meaning that a given measure is automatically eligible for a specific rebate (e.g. at the time of writing, Union Gas offers a \$40 rebate for every window that is replaced with an ENERGY STAR® Zone 2 or 3 qualified model). They may also be “engineered” or “custom”, which requires the proponent to provide detailed calculations demonstrating the savings that the measure will produce.

Rebates reduce the initial cost of an EE project, but don't solve the problem of financing the remainder. Rebates can be “stacked” (i.e. combined) with other options. Currently the Independent Electricity System Operator (IESO) is responsible for all incentive programming related to electricity efficiency.

The Government of Canada offered rebates for EE retrofits through its EcoEnergy for Homes program, but this was discontinued in 2012.

LIC/PACE loan

This option is open to municipalities that pass an enabling bylaw. Essentially, the property owner borrows the money for an EE project from (or through) the municipality. The debt is then attached not to the owner, but rather to the property itself, via the tax roll. The owner then makes debt repayments along with their property tax payments.

If the property is sold, the buyer can require that the seller repay the PACE loan as a condition of sale. (This occurs in about 50% of cases in the US PACE program.) If they choose not to, they automatically assume the liability when they take ownership of the property.

This option is very low risk as the municipality holds a more senior debt obligation on the property to that of mortgage lenders. If the property goes into default, and all

efforts to extract payment are unsuccessful, the municipality has the legal right to subject the property to a tax sale. The municipality then recovers its unpaid taxes from the proceeds, before any mortgage lenders are allowed to recover their investment. This low risk can translate into very attractive interest rates.

In some PACE programs, the capital for the loans is supplied from the municipality's reserve funds. In others, private capital is obtained from investors such as pension funds or insurance company asset managers.

Ontario LIC legislation allows the term of the loan to match the usable life of the asset. This could be as long as 25 years.

The municipality is the only entity that can perform certain administrative tasks related to the PACE loan, including:

- Adding the loan to the property at the outset
- Processing payments
- Transferring to another owner on sale
- Liquidating the loan when the term is concluded
- Liquidating the loan when a buyer requires it to be paid in full as a condition of sale

Other tasks related to PACE programming, including specifying contractor qualifications, marketing the program to customers, raising capital, and paying investors, may be performed by a third party (typically called a "delivery agent").

Ontario's LIC legislation allows for the municipality and the delivery agent to recover administrative costs through these methods:

- Interest rate rider on financing terms
- Administration charge added to initial financing capital
- Grant or other discretionary funding sources

Green mortgage

Energy efficient properties offer two key benefits. First, they have higher intrinsic value than less-efficient properties; research conducted into PACE properties in the US showed that they commanded a premium higher than the value of the PACE loan. This means that the PACE project added value over and above its cost. By comparison, other renovation projects almost always destroy value; the increase in sale price of the property is less than what the renovation cost.

Second, an energy-efficient property offers its owner protection against unexpected jumps in energy costs. In extreme cases, an increase in electricity or natural gas prices could drive a property owner into default; this outcome is less likely if the property consumes less energy and therefore has lower bills.

In recognition of these two benefits, so-called “green mortgages” offer a lower interest rate to energy-efficient properties. The [Energy Efficiency Mortgage Action Plan](#) is exploring this idea in the European Union and several banks have piloted green mortgage products. Here in Canada, the Canadian Mortgage and Housing Corporation [Green Home program](#) offers a 25% reduction in mortgage loan insurance to property owners that build, buy, or renovate for energy efficiency. In 2011 the Bank of Montreal launched a reduced rate product called the Eco Smart Mortgage but has since abandoned it. It does not appear that any major Canadian bank offers a green mortgage product.

Recommended approach

The only option listed above that has the potential to drive significant adoption of EE retrofits in the near term is PACE financing. It is therefore recommended that Guelph adopt a PACE program as soon as practical. The program should be targeted to achieve the following objectives:

- Address energy poverty by targeting low-income or affordable housing
- Focus on very large projects to reduce the share of PACE administration costs as a percentage of overall project cost
- Reduce sales cycles by focusing on commercially-owned rather than owner-occupied properties

The type of property that fulfills each of these criteria is multi-unit residential buildings (MURBs). They often house tenants in the lower income category. They are typically larger buildings, requiring larger investment to drive significant energy efficiency improvement. They are also commercially owned, which means that investment decisions are driven by economics and a sound business case.

Based on prior direction from Council, the role of the municipality should be kept to the bare minimum. It is therefore recommended to employ a delivery agent to perform all tasks other than those that only the municipality can perform.

The Delivery Agent

This entity (and any subsidiary entities it engages on a subcontract basis) will be the cornerstone of the program. It will perform the following tasks:

1. In consultation with OEG, develop strategies for engagement with all relevant stakeholders/partners, including:
 - a. Investors
 - b. eMerge Guelph Sustainability and other local organizations
 - c. Property management corporations
 - d. Realtors and mortgage brokers
 - e. Mortgage lenders
 - f. Property insurers
 - g. Contractors
 - h. Energy auditors
 - i. Suppliers
 - j. Utilities
 - k. Architects/design consultants
 - l. Building science consultants
 - m. Local municipality
 - n. Peer municipalities
 - o. Property owners
2. Manage relations with investors, including:
 - a. Identifying potential investors

-
- b. Pitching the program
 - c. Obtaining investor agreement to provide funds
 - d. Execute all necessary legal documents
 - e. Receiving funds from investors
 - f. Manage all “parked” funds until such a time as they may be remitted to each property owner
 - g. Manage repayment of funds to investors, including agreed interest
3. Manage relations with eMerge Guelph Sustainability and other local organizations with goals that are aligned with those of the program, including:
- a. Providing collateral material to assist with promoting the program
 - b. Specifying what data must be collected when referring a prospective customer
 - c. Establishing an appropriate fee to be paid out in consideration of the referral value
4. Manage relations with property management corporations, including:
- a. Pitching the value of energy efficiency retrofits to
 - i. Increase the asset value of the building
 - ii. Increase the attractiveness of the property to prospective tenants
 - iii. Reduce the risk of tenant default on rent payments
 - iv. Reduce risks to the integrity of the building, such as cold spots leading to condensation and mold/mildew
 - b. Facilitate discussions with the actual property owner with the goal of signing them up as a program participant
5. Manage relations with realtors and mortgage brokers, including encouraging realtors to present a PACE project to:
- a. Increase the value of the property in advance of a sale
 - b. Increase the value, comfort, quiet, and cost-effectiveness of a property following sale
6. Manage relations with mortgage lenders, including presenting PACE projects as a tool to:
-

- a. Increase the asset value of the property by an amount greater than the PACE loan value
 - b. Decrease the risk of default on mortgage payments
 - c. Future-proof the property against future fluctuations in energy prices
 - d. Enhance the resilience of the property to extreme weather events, including resulting interruptions in energy supply
- 7. Manage relations with property insurers, including item 6(d) above and its potential to reduce overall insurer risk, offer discounted premiums, and communicating these facts to policyholders to encourage program uptake
- 8. Manage relations with contractors, including:
 - a. Developing contractor eligibility criteria, likely including a 3rd party qualification program
 - b. Developing and implementing a program to help property owners to select a contractor
 - c. Developing and implementing a program for property owners to evaluate contractor performance
 - d. Working with local stakeholders including post-secondary institutions, the Ontario College of Trades, to develop and grow a workforce with the necessary skills to support the program
- 9. Manage relations with energy auditors, including:
 - a. Identifying an energy audit framework that is suitable to the PACE program, consisting of:
 - i. Auditor qualifications
 - ii. Audit methodology
 - iii. Audit standards
 - iv. Auditing tools
 - v. Audit deliverable templates and samples
 - b. Determining whether a pre and post audit will be a mandatory element of the program or a value-added option offered at an additional charge
 - c. Determining how to integrate audit execution in the context of the PACE program with audit-related offerings from utilities (see below)

-
- d. Aggregating audit results in a database with other salient project attributes to provide a resource to guide program continuous improvement
10. Manage relations with suppliers, including:
- a. Developing product eligibility criteria, likely including a 3rd party evaluation program (e.g. ENERGY STAR®)
 - b. Integrating the PACE program delivery process with product customer evaluation/review processes and tools
 - c. Arranging bulk discounts
11. Manage relations with utilities (or entities responsible for delivery of EE incentive programs, such as the IESO), including:
- a. Promoting the program through bill inserts or other means, especially after the property changes hands (as this is when owners are most likely to engage in a retrofit project)
 - b. Identifying EE measures that are eligible for both the PACE program and utility incentives/rebates
 - c. Harmonizing the application processes for the PACE program and incentive programs to allow both to be completed in a single step
 - d. Harmonizing energy audit processes and rebates
 - e. Integrating rebate payment process
12. Manage relations with architects/design consultants, including:
- a. Demonstrating the benefits of adding a PACE EE project to the scope of an existing renovation project
 - b. Providing tools to facilitate integrating EE measures into a renovation design, including modelling of the benefits
13. Manage relations with a building science consultancy, including:
- a. Identifying or creating a standard that contractors must meet to be eligible to participate in the program
 - b. Collaborating with other entities to develop the standard, including:
 - i. Peer municipalities
 - ii. Provincial ministries such as the Ministry of Environment, Conservation, and Parks; the Ministry of Natural Resources and

Forestry: and the Ministry of Energy, Northern Development, and Mines

- iii. Federal ministries such as Natural Resources Canada and Environment and Climate Change Canada
- iv. Canadian Green Building Council

14. Manage relations with the local municipality, including:

- a. Assisting with continuous improvement of LIC administration process
- b. Confirming LIC receipts that the municipality retains to defray the costs of LIC administration
- c. Working with the municipality to monitor program key metrics, such as:
 - i. New PACE loans executed
 - ii. Total PACE repayment receipts
 - iii. Property sales involving PACE loans
 - iv. PACE loans that are paid out, either as a precondition of property sale or otherwise under the direction of the property owner
 - v. PACE loans in default (as a percentage of the overall default rate)
 - vi. Tax sales executed on PACE properties
- d. Program qualitative reporting in the context of overall OEG progress reporting

15. Manage relations with peer municipalities, including:

- a. Identifying and collaborating with municipalities that are in the process of developing and deploying PACE programs
- b. Reporting on PACE program progress
- c. Developing options for extending the program to other municipalities, such as:
 - i. A playbook resource
 - ii. Hands-on assistance with setting up new local entities modeled on OEG and the Delivery Agent
 - iii. Expanding the service territory of OEG and/or the Delivery Agent

16. Manage relations with property owners, including:

- a. Sales and marketing
- b. Qualifying applicants (see details below)

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- c. Instructing successful applicants on their role in the process
 - d. Advancing funds to pay the contractor deposit, if applicable
 - e. Directing them to resources to assist with:
 - i. Contractor selection
 - ii. Reviewing and executing the contract
 - iii. Applying for and receiving utility and/or government incentives/rebates
 - iv. Paying a deposit
 - v. Overseeing the project
 - vi. Reviewing completed work, including making and closing out a deficiency list
 - vii. Evaluating and reporting on contractor performance
 - viii. Issuing final payment to the contractor
 - ix. Understanding the warranty and addressing any issues that arise during the warranty period
 - f. Issuing final payment
 - g. Following up on any issues/questions regarding the PACE loan and repayment process
 - h. Providing guidance regarding subsequent property sale, including:
 - i. Paying out the PACE loan if the buyer requires it
 - ii. Providing a PACE primer to the buyer if they choose not to pay out the loan
 - i. Advising the property owner when the PACE loan has been fully paid
17. Manage program sales and marketing, including development of the following sales channels:
- a. Contractors presenting a PACE project as a potential change order on a renovation project at some stage of completion
 - b. The eMerge Home Tune-Up
 - c. Various programs that OEG supports, such as My World, My Choice
 - d. Real estate stakeholders, including realtors, mortgage brokers, mortgage lenders, and utilities

18. Qualify program applicants and either accept or reject them according to specified criteria, including:
 - a. The applicant must be able to demonstrate that all persons/entities on the title for the property (as determined by a title search) agree to have the PACE loan attached to the property
 - b. The property owner must be up to date on their property tax payments
 - c. The loan value may not be higher than a specified percentage of property value
19. Communicate the outcome of the eligibility screening to the property owner
20. Issue the request to the City to add the LIC to the property
21. Release funds to the property owner (including any advance/deposit that the contractor requires, and the balance due upon project completion)
22. Receive aggregated PACE repayment instalments from the City (net of the agreed fee for recovery of costs for LIC administration)
23. Retain the portion of the administrative fee associated with its own operations
24. Forward net, aggregated PACE repayment instalments to investors
25. Report on progress to all stakeholders
26. Work with OEG to promote/advocate for a mandatory requirement that all property renovation projects include measures to bring the entire building up to the EE requirements of the current Ontario Building Code

To establish the delivery agent relationship, OEG will likely start by issuing a Request for Proposals from organizations wishing to partner with OEG in the role of Delivery Agent. If no suitable organization is identified, OEG will build the Delivery Agent organization from the ground up.

Partners

It is recommended that the parties listed in item 1 of the previous section be engaged as additional partners in the program.

The role of each party is elaborated below.

Investors

-
- Supply capital for PACE projects, and receive a return on their investment. Potential investors include insurers (especially property insurers), pension funds, and even individual investors making deposits through a cooperative or other aggregating entity.

eMerge Guelph Sustainability and other local organizations

- Market the PACE program to participants in programs such as the eMerge Home Tune-Up program, positioning PACE as a next logical step.
- Pass referrals to the Delivery Agent for follow up.
- Receive a referral fee as a reward.

Property management corporations

- Market the PACE program to property owners as a means to reduce property management risks such as damage from moisture and tenant default on rent payments.
- Pass referrals to the Delivery Agent for follow up.

Realtors and mortgage brokers

- Market the PACE program to sellers as a means to enhance the value and salability of properties before they are listed, and to buyers as a means to enhance the value, comfort, and operating cost profile of properties after purchase.
- Pass referrals to the Delivery Agent for follow up.

Mortgage lenders

- Encourage borrowers to adopt the PACE program as a means to enhance the asset value of the property and reduce the likelihood of default on mortgage payments.
- Pass referrals to the Delivery Agent for follow up.

Property insurers

- Encourage policyholders to adopt the PACE program as a means to decrease property susceptibility to extreme weather risks, whether these may be direct (e.g. water damage due to flooding) or indirect (e.g. pipes freezing and bursting when heating plant stops working during a power failure), and thereby offer savings on premiums.
- Pass referrals to the Delivery Agent for follow up.
- Participate in the PACE program in the role of investor, to align financial assets with business objectives.

Contractors

- Encourage renovation clients to adopt the PACE program as a no-money-down increase to the project scope that will enhance the building's cost-effectiveness, comfort, quiet, and health and the opportunity to attain all this while the usability of the property is already disrupted by the initial renovation.
- Pass referrals to the Delivery Agent for follow up. Alternatively, use a direct sign-up process to qualify applicants on the spot (as some US PACE providers offer).

Energy auditors

- Conduct pre and post retrofit energy audits to demonstrate the effectiveness of the project.
- Provide program participants with an audit report including audit approach, findings, and recommendations.

Suppliers

- Supply products aligned with PACE program objectives (see *What's included in an EE project*, above).

-
- Provide bulk discounts to reflect the large purchase volumes that result from the success of the program.

Utilities

- Integrate incentive program application processes with the PACE program application process.
- Promote the program to customers through bill inserts and dedicated mail-outs when the property changes hands.

Architects/design consultants

- Promote adoption of the PACE program to renovation clients as a no-upfront-cost method to enhance the building's cost-effectiveness, comfort, quiet, and health.
- Pass referrals to the Delivery Agent for follow up.

Building science consultant

- Develop a certification/qualification program for contractors to demonstrate that they have the required skills, experience, and ability to deliver successful EE retrofit projects.

Local municipality

- Establish and manage PACE administrative processes
- Pass the LIC bylaw
- Add the LIC to the tax roll for each PACE property
- Issue property tax bills*
- Collect property tax remittances, including PACE repayment revenues*
- In the event that the property owner defaults on payments, execute established procedures (ultimately concluding with a tax sale if all other measures to obtain payment are unsuccessful)*

- Remit the aggregate LIC receipts to the Delivery Agent, net of the agreed amount for recovery of LIC administration costs
- Retire the LIC if it is paid out upon the request of the property owner, as a condition of sale, or on completion of the payment schedule
- On sale of the property, transfer the LIC to the new property owner they have not requested that it be liquidated as a condition of sale

* These items are not significantly different from current practice in the absence of the LIC/PACE program.

The role of each of the parties in the business process is depicted in *Appendix: GEERS Business Process*.

Benefits

The table below lists the benefits to each of the program stakeholders.

Stakeholder	Benefits
1. Investor	<ul style="list-style-type: none"> • A low-risk investment with an attractive return
2. eMerge Guelph Sustainability and other local organizations	<ul style="list-style-type: none"> • Ability to offer a more complete and comprehensive service to clients • Referral fee revenues
3. Property management corporation	<ul style="list-style-type: none"> • Reduced risk of tenant default on rent payments • Reduced risk of building damage due to moisture and mold/mildew
4. Realtor, mortgage broker	<ul style="list-style-type: none"> • Enhanced service to clients • Competitive differentiator
5. Mortgage lender	<ul style="list-style-type: none"> • Enhanced value of the asset • Reduced risk of borrower default on mortgage payments
6. Property insurer	<ul style="list-style-type: none"> • Enhanced resilience of the insured property; reduced risk of insured loss due to extreme weather • Opportunity to offer a premium discount as a reward to the policyholder

	<ul style="list-style-type: none"> • Competitive differentiator
7. Contractor	<ul style="list-style-type: none"> • Increased project scope and revenues
8. Energy auditor	<ul style="list-style-type: none"> • Additional projects and service revenues
9. Supplier	<ul style="list-style-type: none"> • Additional sales and resulting revenues
10. Utilities	<ul style="list-style-type: none"> • Increased uptake of incentive/rebate programs • Ability to accommodate growth without adding to the asset base
11. Architect/design consultant	<ul style="list-style-type: none"> • Enhanced professional image
12. Building science consultant	<ul style="list-style-type: none"> • Service revenues • Enhanced professional eminence due to role in developing a widely-accepted standard
13. Local municipality	<ul style="list-style-type: none"> • Contribution to the goals of the Pathway to Net Zero Carbon • Increased assessment values • Enhanced ability to accommodate growth, by freeing up utility capacity (water, wastewater, electricity, and natural gas) • Full recovery of costs incurred
14. Peer municipality	<ul style="list-style-type: none"> • An established, successful PACE program to use as a model for their own program
15. Property owner	<ul style="list-style-type: none"> • Reduced property operating costs • Increased quiet • Greater comfort • Reduced risk to health • Enhanced resilience to energy supply disruption • Obtaining all of the above with no out-of-pocket costs or investment

Risks and mitigation

The PACE program poses risks to some stakeholders. These risks, and the means to mitigate them, are detailed below.

Risk: The property owner defaults on payment.

Description: The property owner is unable to make one or more property tax payments, including the Local Improvement Charge component.

Affected stakeholders: Delivery agent, investors, mortgage lender, local municipality, property owner

Mitigation: Property tax collections are the primary revenue source for municipalities. Default rates are extremely low given that the municipality has the power in extreme cases to subject the property to a tax sale. Property owners usually resolve the problem and clear the arrears before the municipality is compelled to exercise this option. This factor contributes to why interest rates on municipal bonds are also quite low and they are considered among the lowest risk financial instruments available.

Guelph has among the lowest default rates in the province. In the US, properties with PACE loans have been shown to have a lower default rate than those without. The combination of these three factors makes this risk exceedingly low.

In the US, mortgage insurance providers Fannie Mae and Freddie Mac have declined to cover properties with PACE loans. In Toronto, some mortgage lenders have declined to give their consent for borrowers to participate in HELP. To mitigate concerns of mortgage lenders and insurers, the State of California implemented a loan loss reserve; it has never been used. It is therefore recommended not to implement such a mitigation measure, unless it is implemented on a provincial scale as was recommended by the former Environmental Commissioner of Ontario²⁴.

This risk is best mitigated by highlighting the fact that the PACE project enhances the property value and is associated with a lower rather than a higher default rate. In other words, a PACE property is a better mortgage risk than a non-PACE one.

Risk: Project energy savings fail to meet expectations.

²⁴ <https://docs.assets.eco.on.ca/reports/energy/2019/why-energy-conservation.pdf#page118>

Description: An energy audit will typically include an estimate of the savings that can be expected after the recommended EE measures are implemented, and hence the business case for the project. There are three main reasons why the project may fail to meet expectations:

- The auditor overestimated the benefit of the proposed EE measures.
- The contractor made errors in the installation which prevented the included measures from performing as expected.
- The occupants exhibited wasteful behaviours that offset the expected energy savings.

No matter the reason, the result is that the savings - which were intended to pay back the initial investment - failed to materialize. This can have a negative impact on the property owner, as well as all players with a visible connection to the project. In an extreme case, a badly executed project can actually cause damage to the building.

Affected stakeholders: Property owner, delivery agent, contractor, municipality

Mitigation: This risk can be mitigated by requiring that the contractor obtain a specified qualification/certification before they are eligible to deliver a PACE-financed project. Parties involved in project financing (principally the delivery agent, but also the municipality) should avoid any direct link to the contractor, by avoiding explicit contractor endorsement (e.g. through an approved contractor list). In addition, the delivery agent can mitigate this risk for future projects by mandating all participating property owners to provide a review and rating of their contractor on a public forum, to provide transparency and accountability. The contractor can mitigate their risk by obtaining warranty insurance, as well as by training the occupants and/or the property manager how to obtain optimum performance from the retrofit and tuning any newly-installed equipment to manufacturers specifications after the project is complete. (This is referred to as commissioning.)

Risk: A project has excessive delays.

Description: Poor project planning, including resource mismanagement, can draw out project duration by weeks or even months. This can lead to occupant discontent and in extreme cases legal action.

Affected stakeholders: Property owner, occupants, contractor

Mitigation: This risk is mitigated by requiring contractors to meet the qualification/certification, and by providing transparency on contractor performance through a public customer review and rating platform.

Risk: A supplier product causes project failure.

Description: If a product such as a high-efficiency water tank fails to perform as intended, it can cause the project to fail to meet EE expectations and may even damage the building.

Affected stakeholders: Suppliers, contractor

Mitigation: This risk can be mitigated via the product warranty, and by requiring contractors to be trained how to install the product properly and in accordance with the supplier's specifications.

Risk: Outstanding PACE loans negatively impact municipal finances.

Description: Where a municipality directly borrows the funds for a PACE program, there is a risk that excessive borrowing could affect the City's credit rating and/or encroach on debt limits imposed by local policy or provincial regulation.

Affected stakeholders: Municipality

Mitigation: This risk only exists if the liability is on the municipal ledger. It is mitigated by taking the debt off the municipal books completely, and having it reside exclusively with the Delivery Agent.

Risk: Disruption to building inspection cost recovery.

Description: Building inspection fees for larger properties are used to cross-subsidize those for smaller properties. If there is a significant increase in the number of inspections for smaller properties, it could drive Building Services into a budget deficit.

Affected stakeholders: Municipality

Mitigation: Begin the program with a focus on large-value properties. As the program is made available for smaller properties, monitor the balance of inspection costs and make adjustments as required.

Program economic analysis and business case

The economic benefits of the proposed program vary from stakeholder to stakeholder. A business case for a sample multi-unit residential building is provided below.

Property type	Multi-Unit Residential Building
Number of units	100
Floor area per unit (m ²)	90
Total floor area (m ²)	9,000
Retrofit cost per m ² (per 2015 GEERS report, adjusted for inflation)	\$75.50
Total retrofit cost	\$679,000
Cost per MWh, natural gas	\$23.40
Cost per MWh, electricity	\$146.96
Operating energy savings, natural gas	35%
Operating energy savings, electricity	35%
Total operating cost savings	\$63,436.76
LIC interest rate	6%
LIC repayment term	20 years

GEERS annual repayment	\$59,198.31
Net annual savings to owner, Year 1	\$4,238.44
Co-benefits	<ul style="list-style-type: none"> • Increased occupant comfort by eliminating drafts • Reduced noise transmission from outside • Reduced risk of occupant health impacts • Reduced exposure to energy price fluctuations

The Delivery Agent program financials are estimated to be as follows:

Total investment in first year of operation	\$25,000,000
Total number of buildings per example	37
Annual revenue	\$2,190,000
Investor repayment (principal + interest at 4%)	\$1,840,000
LIC administration fee to City	\$50,000
Net revenue	\$300,000

Targets, measurement, and reporting

The retrofit program has the following principal targets, taken from the *Pathway to net zero carbon* report presented to Council in 2018:

- Retrofit 98% of pre-1980 dwellings by 2050, with retrofits achieving thermal and electrical savings of 50%.
- Retrofit 98% of dwellings built between 1980-2017 by 2050, with retrofits achieving average thermal and electrical savings of 50%.
- Retrofit 98% of pre-2017 ICI buildings by 2050, with retrofits achieving average thermal and electrical savings of 50%.

Further, PACE financing could be used to achieve the following targets associated with HVAC equipment:

- Air source heat pumps are added to 50% of residential buildings and 30% of commercial buildings by 2050

-
- Ground source heat pumps are added to 20% of residential and 40% of commercial buildings by 2050
 - Solar PV- net metering Solar PV systems are installed on 80% of all buildings by 2050. These PV systems provide on average 30% of consumption for building electrical load for less than 5 storeys and 10% for multi-unit buildings greater than 5 storeys and commercial buildings.
 - Hot water heat pump installations are scaled up to 80% of residential buildings by 2050, and 50% of commercial buildings by 2050.

Finally, PACE financing could be used to finance the purchase of electric vehicle chargers in support of the following targets:

- 100% of new passenger vehicles are electric by 2030.
- 95% of new commercial vehicles are electric by 2030.

To aid in tracking progress toward these goals, the following metrics will be used:

1. Number of units retrofitted
2. Aggregate floor area retrofitted
3. Aggregate electricity savings arising from retrofits (kilowatt-hours)
4. Aggregate natural gas savings arising from retrofits (cubic metres)
5. Aggregate dollar savings, broken out by energy type
6. Aggregate carbon emissions reductions

Each of these metrics will be broken out by building category (i.e. single detached, double detached, row housing, apartments, industrial, commercial, and institutional). We will endeavour to track all retrofit projects, not just those done through the GEERS program.

The retrofit business volume will not be constant, as the renovation sector will take time to build up capacity to match demand. Initially, volume will double every five years, meaning a compound annual growth rate of 15%. After ten years, growth will level off. This is illustrated in the following two tables (excerpted from the *Pathway to net zero carbon*), the first showing the aggregate number of residential units retrofitted as of the end of each five-year period:

Year	Single detached	Double detached	Rows	Apartments
2026	10,856	1,287	4,076	3,696
2031	21,711	2,574	8,152	7,392
2036	22,154	2,627	8,318	7,543
2041	23,098	2,739	8,436	7,673
2046	23,394	2,774	8,309	7,596
2051	23,369	2,772	8,071	7,450

The next table shows the aggregate floor area (in square metres) of retrofit activity in the ICI sector in five year increments:

Year	Commercial	Retail	Warehouse	Education	Institution
2021	96,400	248,033	126,867	268,268	193,007
2026	193,897	488,984	256,718	547,689	387,745
2031	244,765	611,124	325,779	701,108	491,080
2036	270,899	677,481	364,401	785,343	545,336
2041	283,759	712,700	385,190	831,593	574,513
2046	289,632	729,794	396,117	856,987	589,325
2051	291,931	736,692	401,658	870,930	596,239

The Delivery Agent will provide detailed quantitative reporting on progress of the above metrics on an annual basis, along with quarterly qualitative progress reports.

Next steps

The first order of business is to get the Delivery Agent in place and ready to begin work. This is expected to take 4-6 months, and will include the following tasks:

- Analyse business process in detail to identify all requirements
- Develop and issue RFP

- Revise RFP in response to proponent feedback
- Select successful proponent

A parallel work stream will mobilize investment capital, so that it is ready to be invested when the Delivery Agent is open for business.

As described above in the section entitled *Recommended approach*, the first target market for the Delivery Agent will be MURBs. It is proposed to focus solely on this market segment in the first year of operations. This will maximize the amount of capital mobilized and the amount of floor area retrofitted, compared to the number of transactions. This will give the City of Guelph Finance Department time to drive down the organizational costs associated with LIC administration, and will allow these costs to be spread over a much larger per-transaction capital base.

In the second year of operations, it is proposed to continue having sales and marketing efforts focus on MURBs. Other building types will be welcome to participate in the program, but will not be specifically targeted.

By Year 3, sales and marketing efforts will be expanded to include all building types and sectors.

This sales and marketing approach is summarized below:

Year	Single detached Double detached Townhomes	MURBS	Industrial Commercial Institutional
1	No	Yes	No
2	Reactive	Yes	Reactive
3	Yes	Yes	Yes

By Year 3, the program will be well on its way to driving down energy consumption and carbon emissions in Guelph's building sector. The success of this effort will play a crucial role in achieving the goal of making Guelph a Net Zero Carbon community by 2050.

Appendix: GEERS Business Process

Refer to diagram at [this link](#).

TO **Committee of the Whole, City of Guelph**

SUBJECT **Quarterly progress report to Guelph City Council**

DATE January 13, 2019

Per the Service Agreement with the City of Guelph¹, this document provides a progress report on activities we have been working on since the inaugural Board meeting on July 8.

Governance and General Operations

Service agreement. The service agreement between Our Energy Guelph and the City of Guelph² was fully executed on August 15.

Board member updates. Kristen Tilley became Secretary of the OEG Board of Directors in August. Alex Ciccone was welcomed to the Board in the meeting held on November 5th.

With the resignation of Helen Loftin from the City in December 2019, we are seeking a replacement to serve as the City representative on the Board. We recommend that Helen's successor in the position of General Manager of Business Development and Enterprise continue to serve in this role.

All other board roles remain as they were in the report to Council on July 22, 2019³.

Executive Director recruitment. The posting was published in August, interviews were conducted in September, and an offer was extended to Alex Chapman in October. Alex started in the role on November 4th.

Operational funding. The City transferred the initial \$49,000 in August, and made the agreed monthly payments of \$10,500 in each of the following months.

Office space. The ED is currently hot-desking at 10C, as well as working from home. Other space options we are exploring include Innovation Guelph and the University

¹ Schedule 1, Item 3. Agreement dated July 26th, 2019.

² https://guelph.ca/wp-content/uploads/council_agenda_072219.pdf#page=60

³ https://guelph.ca/wp-content/uploads/council_agenda_072219.pdf#page=53

³ https://guelph.ca/wp-content/uploads/council_agenda_072219.pdf#page=45

of Guelph. A permanent space solution will not be a priority until additional staff are hired.

Information technology. We have signed up with TechSoup, a provider of IT products for the nonprofit sector. This has allowed us to purchase products such as Google G Suite and a laptop computer at significant discounts.

Nonprofit partnerships. We have become members of both 10C, the Guelph Chamber of Commerce, and the Ontario Nonprofit Network (ONN). ONN membership will provide us access to their group pension, benefits, and insurance programs including Directors & Officers Insurance.

Capital funding. We are designing an entity to fund the capital projects in the pathway to net zero carbon⁴. Since the Community Energy Initiative aims to minimize the leakage of energy dollars out of Guelph, we should similarly minimize the leakage of investment returns from CEI capital projects. The guiding principle for the fund is therefore that it will mobilize local capital to fund local projects delivering local economic, environmental, and social benefit and producing local financial returns. Our next step is a summit meeting in mid-January, bringing together various local stakeholders as well as other parties from outside of Guelph with specific expertise or assets to offer in this effort.

NRCan Solar Uptake Project. We are working with Natural Resources Canada and Alectra Utilities on a tool that would improve/encourage uptake of rooftop solar photovoltaic systems. Progress has slowed due to funding constraints, but we expect that this project will regain momentum in the new year.

Funding additional staff positions. There are four distinct federal job creation programs that may allow us to add staff to manage programs such as Green Economy Canada and Random Acts of Green (see below). We continue to investigate these opportunities.

Guelph Energy Managers (GEMS)

GEMS is a community of practice of energy and environment management professionals with Guelph's largest employers. Each quarterly meeting is hosted by a member organization on a volunteer basis. The Fall 2019 event was held at City Hall. Owens Corning has volunteered to host the Winter meeting in early December, and Linamar plans to host the Spring meeting in March. Meetings consist of general information sharing, roundtable updates from each member, an "Ask the Expert" segment, and a deep-dive case study on a specific energy project that the host selects. The meetings conclude with a tour, typically highlighting the case study project.

Since GEMS has been in operation for nearly two years, a member survey was conducted in the fall to assess whether we needed to make any changes in our approach. The respondents supported keeping the meeting frequency, duration,

⁴ <https://www.ourenergyguelph.ca/cei-update-part-2/the-pathway-to-net-zero-carbon>

format, hosting approach, and leadership model as is. There was also considerable enthusiasm for sector and/or topic-specific summit meetings, the most popular being Cleantech (water, waste, renewable energy), energy storage and microgrids, renovations and retrofits, on-site power generation, and new construction.

We are currently in discussions to create a Green Economy Canada hub. This would help us to launch a program similar to the Regional Sustainability Initiative led by Sustainable Waterloo Region, focused on assisting businesses and other organizations with setting sustainability goals and executing action plans to meet those goals.

Education, Communication, Outreach and Awareness (ECO A)

Youth Action on Climate Change. Led by University of Guelph students, this group aims to channel climate-related concerns of teens (and tweens) into constructive efforts to engage political leaders and affect change in the community. Building on the success of a workshop held at the UofG Arboretum in March, the group held a second workshop in Waterloo in July⁵. The lead on YACC, Emily De Sousa, is working with City of Guelph staffer Jennifer Juste, GCAT, and OEG Chair Kirby Calvert to conduct youth-led, youth-focused research and education on awareness of and barriers to active transit. The work involves a survey and possibly participatory mapping to align with the City's Transportation Master Plan. Their first priority has been active transportation. The group executed a public survey on this topic in the fall and delivered the results to City staff and other stakeholders in October.

Random Acts of Green. Developed in Peterborough, this mobile device app⁶ uses rewards to encourage sustainable behaviours. Users log their sustainable actions and are awarded "green points", which they can then exchange for discounts at local businesses. We are currently working on an arrangement whereby OEG encourages uptake of the app as well as paid business partnerships, and in return receives a share of the resulting revenue.

My World, My Choice. This program places University of Guelph students in primary and secondary schools to mentor younger students on sustainability. Mentors lead an experiential learning exercise, then students divide into teams to execute a sustainability-focused project over the following few weeks. The program concludes with an awards event recognizing student teams that stood out. We have secured funding assistance for the program from Alectra.

Planet Protector Academy. This program uses a superhero-themed multimedia approach to engage younger students (Grades 2-4, and in some cases 5-6) in "missions" that promote sustainable living. Students bring their program workbooks

⁵ See press coverage at <https://www.cbc.ca/news/canada/kitchener-waterloo/youth-take-on-climate-change-university-waterloo-event-1.5209892>

⁶ <https://raog.ca/>

home and engage their families in completing missions such as walking or biking to school, taking shorter showers, turning off lights when leaving a room, and avoiding idling and speeding. Three City departments provide funding support, while both school boards facilitate the introduction of the program into classrooms. We are also working with the UofG Community Engaged Scholarship Institute to replace the current vendor self-evaluation with student resources providing a 3rd party evaluation. This would also examine ultimate program impacts such as reduced household energy and water consumption, as well as uptake of follow-on actions such as the eMerge Home Tune-Up.

Newsletter. We have done two initial trials of a newsletter based on the MailChimp platform. The first went to GEMS members, while the second went to alumni of the CEI Update Task Force. The feedback we've received so far has been positive.

Communications team. We plan to convene a group of OEG stakeholders with communications experience to provide direction and oversight, and we have received a proposal from ECOA team member Emily De Sousa to undertake the preparation of the plan.

ED Alex Chapman participated in a panel discussion at the UofG Lang School of Business Sustainability Conference. The discussion was very well attended, received considerable student Q&A participation, and was well received by the attendees.

Alex also delivered presentations to the Alectra Sustainability Roundtable on November 27, and to the Royal City Men's Club on November 28.

Parkade Grand Opening. OEG exhibited at the grand opening of the Market Parkade. We used this opportunity to sign up interested visitors for the OEG newsletter.

Educators summit. Given the number of people with an interest in sustainability education that have become connected to OEG in some way, we are discussing the idea of getting them all in a room to do some level setting and to brainstorm on challenges and solutions. The challenges include:

- Climate change treatment in the academic curriculum (e.g. causes are not addressed)
- Addressing the gap in our programming at the Grade 5 and 6 level (PPA ends after Grade 4, MWMC starts at Grade 7)
- Training students for “reverse mentoring” with local businesses interested in creating and/or implementing sustainability plans
- Using schools as beachheads for neighbourhood-level climate mitigation and adaptation action, including targeting local multi-unit residential buildings for GEERS retrofits

- Retraining workers whose jobs are disrupted by the Energy Transition and related trends (e.g. the shift from privately-owned, human-driven internal combustion engine cars to shared, autonomous electric vehicles)

Blog post. We published an article explaining the meaning of Net Zero Carbon⁷, partially in response to discussion at the last board meeting. A follow-up post⁸ addresses the issue of scope and boundaries in defining the details around the net zero carbon goal.

Guelph Energy Efficiency Retrofit Strategy (GEERS) Advisory Group

Convened in February, this advisory group has prepared a report to Council that will accompany this report.

Regards,

Alex Chapman, Acting Executive Director
Our Energy Guelph

⁷ <https://www.ourenergyguelph.ca/community-matters/net-zero-carbon-what-does-it-mean>

⁸ <https://www.ourenergyguelph.ca/community-matters/scoping-1-2-3>

THE CORPORATION OF THE TOWN OF DEEP RIVER

P.O. BOX 400 • 100 DEEP RIVER ROAD • DEEP RIVER, ONTARIO K0J 1P0
Tel: (613) 584-2000 • www.deepriver.ca • Fax: (613) 584-3237



January 8, 2020

Hon. Doug Ford, Premier of Ontario
Queen's Park Legislative Building
1 Queen's Park, Room 281
Toronto Ontario
M7A 1A1

Subject: Premiers to Develop Nuclear Reactor Technology

Dear Honourable Doug Ford,

Please be advised that at the Regular Meeting of Council held October 9th, 2019, Council for the Corporation of the Town of Deep River passed the following resolution:

BE IT RESOLVED THAT the CBC News report entitled "**Group of premiers band together to develop nuclear reactor technology**", be received, and

WHEREAS the Premiers of Ontario, Saskatchewan and New Brunswick have announced their intention to work together on the development of small modular reactors to help their provinces reduce carbon emissions and address the challenges of climate change;

WHEREAS Canada has demonstrated excellence and leadership in the nuclear industry on the world stage for more than 70 years;

WHEREAS the Canadian nuclear industry is one of the safest and most well-regulated energy sectors in the world under the oversight of the Canadian Nuclear Safety Commission;

WHEREAS the citizens of Ontario have enjoyed the benefits of safe, clean, low-carbon energy produced by Ontario's nuclear industry for over 50 years;

WHEREAS small modular reactors have the potential to provide municipalities, especially rural and northern municipalities, with an innovative technology that provides a safe, low-carbon alternative to meet energy demands; therefore,

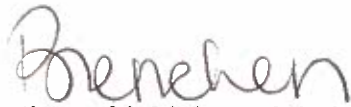
BE IT RESOLVED the Town of Deep River write to the Premiers of Ontario, Saskatchewan and New Brunswick to express support for their decision to work together on the development of small modular reactor technology as a safe, low-carbon energy option;

THAT the Town of Deep River write to the Prime Minister of Canada, Minister of Natural Resources, and the remaining provincial premiers asking that they support investment in the research and development of small modular reactor technology as an innovative, safe, low-carbon energy option; and

THAT this resolution be circulated to all upper and lower-tier municipalities in Ontario, and the Federation of Canadian Municipalities, for their consideration.

CARRIED

Thank you and please contact the writer should you have any additional questions.
Kindest regards,



Bethany McMahon, Administrative Assistant
Town of Deep River

cc: Hon. Scott Moe, Premier of Saskatchewan
Hon. Blaine Higgs, Premier of New Brunswick
Hon. Stephen McNeil, Premier of Nova Scotia
Hon. Brian Pallister, Premier of Manitoba
Hon. John Horgan, British Columbia
Hon. Dennis King, Premier of Prince Edward Island
Hon. Jason Kenney, Premier of Alberta
Hon. Dwight Ball, Premier of Newfoundland and Labrador
Hon. Francois, Premier of Quebec
Hon. Caroline Cochrane, Premier of Northwest Territories
Hon. Sandy Silver, Premier of Yukon
Hon. Joe Savikataaq, Premier of Nunavut
Hon. Justin Trudeau, Premier of Canada
Hon. Seamus O'Regan of Natural Resources
Association of Municipalities of Ontario (AMO)
Federation of Northern Ontario Municipalities (FONOM)
All Upper and Lower Tier- Municipalities



The Corporation Of The Township Of Stone Mills

4504 County Road 4, Centreville, Ontario K0K 1N0
Tel. (613) 378-2475 Fax. (613) 378-0033
Website: www.stonemills.com.

December 27, 2019

Honourable Jeff Yurek
Minister of Environment, Conservation and Parks
College Park 5th Flr, 777 Bay St.
Toronto, Ontario
M7A 2J3

minister.mecp@ontario.ca

Honourable Premier Doug Ford
Premier of Ontario
Legislative Building
Queens Park
Toronto On M7A 1A1

premier@ontario.ca

Re: Support Resolution of Conservation Authorities – Township of Stone Mills

Dear Premier Ford and Minister Yurek,

At the December 9, 2019 Stone Mills Township Council meeting, Council passed a resolution in support of the continuation of program support for Conservation Authorities in the Province of Ontario.

A copy of the resolution is attached for your consideration. We kindly request your support and endorsement for the continuance of Conservation Authority Support.

Sincerely,

Bryan Brooks
C.A.O./Clerk
Township of Stone Mills

Cc: MPP Daryl Kramp
MP Derek Sloan
Association of Municipalities on Ontario
Quinte Conservation

All Ontario Municipalities
Cataraqui Conservation Authority



The Corporation Of The Township Of Stone Mills

4504 County Road 4, Centreville, Ontario K0K 1N0
Tel. (613) 378-2475 Fax. (613) 378-0033
Website: www.stonemills.com.

RESOLUTION IN SUPPORT OF CONSERVATION AUTHORITIES

WHEREAS the Township of Stone Mills is committed to planning for and protecting the future sustainability of its resources and environment,

AND WHEREAS the Township of Stone Mills is within the Quinte and Cataraqui Conservation Authority areas,

AND WHEREAS the Province of Ontario is currently reviewing the mandate and operation of conservation authorities and;

AND WHEREAS Conservation Authorities provide essential services to municipalities in their watersheds and

AND WHEREAS smaller municipalities do not have capacity or the financial resource to employ staff with the technical expertise that conservation authorities provide and

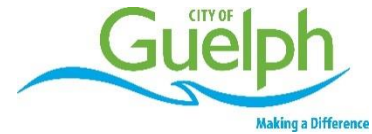
WHEREAS development near watercourses can have significant effects both upstream and downstream

THEREFORE BE IT RESOLVED THAT The Township of Stone Mills encourages the province to continue to support the principle of planning on a watershed basis in the on-going review and prioritize the allocation of adequate funding to support the core mandate of conservation authorities.

AND THAT this resolution be forwarded to Minister of the Environment, Conservation and Parks, Premier Doug Ford, MPP Daryl Kramp, the Association of Municipalities of Ontario, the Cataraqui and Quinte Conservation Authorities and all Ontario Municipalities.

.....
Township of Stone Mills - 4504 County Road 4, Centreville ON K0K 1N0
Attention: C.A.O./Clerk, 613-378-2475 Ext. 225, bbrooks@stonemills.com

Committee of Adjustment Minutes



Thursday, December 12, 2019, 4:00 p.m.

Council Chambers, Guelph City Hall, 1 Carden Street

Members Present:

K. Ash, Chair

S. Dykstra

L. Janis

K. Meads

J. Smith

Members Absent:

D. Gundrum

D. Kendrick, Vice Chair

Staff Present:

P. Sheehy, Program Manager-Zoning

S. Daniel, Engineering Technologist

J. da Silva, Council and Committee Assistant

T. Di Lullo, Secretary-Treasurer

K. Patzer, Planner

M. Witmer, Planner

Call to Order

Disclosure of Pecuniary Interest and General Nature Thereof

There were no disclosures.

Approval of Minutes

Moved by J. Smith

Seconded by S. Dykstra

That the Minutes from the November 14, 2019 Regular Meeting of the Committee of Adjustment, be approved as circulated.

Carried

Requests for Withdrawal or Deferral

Applications: B-2/18 and B-3/18

Owner: Charleston Homes Ltd. And Scattered Lotco Inc.

Agent: Jamie Laws, Van Harten Surveying Inc.

Location: 64 Queen Street

In Attendance: N/A

Secretary-Treasurer T. Di Lullo noted that the agent for the applications had requested deferral to allow additional time to consult with engineering staff. She recommended that the applications be deferred sine die to provide the applicant with ample time for staff consultation.

Secretary-Treasurer T. Di Lullo also noted that correspondence was received after the comment deadline from S. Moraca, resident of Queen Street, in opposition of the applications. She noted that this correspondence was originally submitted prior to the December 13, 2018 hearing and the resident requested it to be recirculated. A copy of the correspondence was provided to the members.

Moved by S. Dykstra

Seconded by L. Janis

That applications B-2/18 and B-3/18 for 64 Queen Street, be **deferred** sine die, and in accordance with the Committee's policy on applications deferred sine die, that the applications will be considered to be withdrawn if not dealt with within 12 months of deferral and that the deferral fee be paid prior to reconsideration of the applications.

Reasons:

The applications are deferred at the request of the agent to allow additional time to consult with staff.

Carried

Current Applications

Application: A-96/19

Owner: Dean Palmer and Jessica Steinhäuser

Agent: N/A

Location: 14 Park Avenue

In Attendance: D. Palmer

Chair K. Ash questioned if the sign had been posted in accordance with Planning Act requirements and if the staff comments were received. D. Palmer, owner, responded that the sign was posted and comments were received.

No members of the public spoke.

Having considered whether or not the variance(s) requested are minor and desirable for the appropriate development and use of the land and that the

general intent and purpose of the Zoning By-law and the Official Plan will be maintained, and that this application has met the requirements of Section 45(1) of the Planning Act, R.S.O. 1990, Chapter P.13 as amended,

Moved by J. Smith

Seconded by S. Dykstra

That in the matter of an application under Section 45(1) of the Planning Act, R.S.O. 1990, c.P13, as amended, a variance from the requirements of Table 5.1.2 Row 7 of Zoning By-law (1995)-14864, as amended, for 14 Park Avenue, to permit a minimum left side yard setback of 0.88 metres for the proposed second storey addition, when the By-law requires a minimum side yard setback of 1.5 metres, be **approved**, subject to the following condition:

1. That the side yard setback of 0.88 metres apply only to the proposed second storey addition on the south side of the property as shown on the Site Plan sketch.

Reasons:

This application is approved, as it is the opinion of the Committee that, with the above noted condition of approval, this application meets all four tests under Section 45(1) of the Planning Act.

Any and all written submissions relating to this application that were made to the Committee of Adjustment before its decision and any and all oral submissions related to this application that were made at a public hearing, held under the Planning Act, have been, on balance, taken into consideration by the Committee of Adjustment as part of its deliberations and final decision on this matter.

Carried

Application: A-97/19

Owner: Giuseppe D'Angelo and Giuseppina D'Angelo

Agent: Ryan Leal, Royal City Construction

Location: 102 Hands Drive

In Attendance: R. Leal

Chair K. Ash questioned if the sign had been posted in accordance with Planning Act requirements and if the staff comments were received. R. Leal, agent, responded that the sign was posted and comments were received.

No members of the public spoke.

Having considered whether or not the variance(s) requested are minor and desirable for the appropriate development and use of the land and that the general intent and purpose of the Zoning By-law and the Official Plan will be

maintained, and that this application has met the requirements of Section 45(1) of the Planning Act, R.S.O. 1990, Chapter P.13 as amended,

Moved by S. Dykstra

Seconded by K. Meads

That in the matter of an application under Section 45(1) of the Planning Act, R.S.O. 1990, c.P13, as amended, a variance from the requirements of Section 4.13.3.2.2 of Zoning By-law (1995)-14864, as amended, for 102 Hands Drive, to permit a parking space within the garage of the existing dwelling to be 3 metres by 5.5 metres, when the By-law requires that the minimum parking space dimensions are 3 metres by 6 metres within a garage or carport, be **approved**.

Reasons:

This application is approved, as it is the opinion of the Committee that this application meets all four tests under Section 45(1) of the Planning Act.

Any and all written submissions relating to this application that were made to the Committee of Adjustment before its decision and any and all oral submissions related to this application that were made at a public hearing, held under the Planning Act, have been, on balance, taken into consideration by the Committee of Adjustment as part of its deliberations and final decision on this matter.

Carried

Application: A-98/19

Owner: 2254102 Ontario Limited

Agent: N/A

Location: 26 Woodycrest Drive

In Attendance: M. Chalmers

Chair K. Ash questioned if the sign had been posted in accordance with Planning Act requirements and if the staff comments were received. M. Chalmers, representative for the owner, responded that the sign was posted and comments were received.

No members of the public spoke.

Having considered whether or not the variance(s) requested are minor and desirable for the appropriate development and use of the land and that the general intent and purpose of the Zoning By-law and the Official Plan will be maintained, and that this application has met the requirements of Section 45(1) of the Planning Act, R.S.O. 1990, Chapter P.13 as amended,

Moved by S. Dykstra

Seconded by L. Janis

That in the matter of an application under Section 45(1) of the Planning Act, R.S.O. 1990, c.P13, as amended, a variance from the requirements of Section 4.13.2.1 of Zoning By-law (1995)-14864, as amended, for 26 Woodycrest Drive, to permit the required parking space to be located to the front of the front wall of the existing dwelling, when the By-law requires that in a R.1 Zone, every required parking space shall be located a minimum distance of 6 metres from the street line and to the rear of the front wall of the main building, be **refused**.

Reasons:

This application is refused, as it is the opinion of the Committee that this application does not meet all four tests under Section 45(1) of the Planning Act, specifically being that the requested variance does not meet the general intent and purpose of the Zoning By-law.

Defeated

Moved by J. Smith

Seconded by K. Meads

That application A-98/19 for 26 Woodycrest Drive be **deferred** sine die, and in accordance with the Committee's policy on applications deferred sine die, that the application will be considered to be withdrawn if not dealt with within 12 months of deferral and that the deferral fee be paid prior to reconsideration of the application.

Reasons:

The application is deferred at the request of the Committee to allow the applicant additional time to consult with staff.

Carried

Application: A-99/19

Owner: Ajit Bharta and Surjit Bharta

Agent: Reema Masri, Masri O Inc. Architects

Location: 4 Golfview Road

In Attendance: R. Masri

T. Madrid

Chair K. Ash questioned if the sign had been posted in accordance with Planning Act requirements and if the staff comments were received. R. Masri, agent, responded that the sign was posted and comments were received.

No members of the public spoke.

Having considered whether or not the variance(s) requested are minor and desirable for the appropriate development and use of the land and that the general intent and purpose of the Zoning By-law and the Official Plan will be maintained, and that this application has met the requirements of Section 45(1) of the Planning Act, R.S.O. 1990, Chapter P.13 as amended,

Moved by L. Janis

Seconded by S. Dykstra

That in the matter of an application under Section 45(1) of the Planning Act, R.S.O. 1990, c.P13, as amended, a variance from the requirements of Section 4.15.1.5 of Zoning By-law (1995)-14864, as amended, for 4 Golfview Road, to permit an accessory apartment size of 103.5 square metres, or 44.8 percent of the total floor area of the dwelling, when the By-law requires that an accessory apartment shall not exceed 45 percent of the total floor area of the building and shall not exceed a maximum of 80 square metres in floor area, whichever is lesser, be **approved**.

Reasons:

This application is approved, as it is the opinion of the Committee that this application meets all four tests under Section 45(1) of the Planning Act.

Any and all written submissions relating to this application that were made to the Committee of Adjustment before its decision and any and all oral submissions related to this application that were made at a public hearing, held under the Planning Act, have been, on balance, taken into consideration by the Committee of Adjustment as part of its deliberations and final decision on this matter.

Carried

Staff Announcements

Secretary-Treasurer T. Di Lullo reminded the members that the annual election of the Chair and Vice Chair positions will take place at the next hearing on January 9, 2020.

Adjournment

Moved by J. Smith

Seconded by S. Dykstra

That this hearing of the Committee of Adjustment be adjourned at 4:23 p.m.

Carried

“Original signed by”

K. Ash
Chair

“Original signed by”

T. Di Lullo
Secretary-Treasurer