Community Energy Plan

Draft Terms of Reference

1. Introduction

1.1 Policy Context

The purpose of a Community Energy Plan (CEP) is to support the transition to a low carbon future. A CEP is a key component in the design of a new community by using quantitative analysis to develop targeted strategies that reduce energy consumption and carbon emissions. The Community Energy Plan process is important because it ensures communities are equipped with the infrastructure necessary to move toward zero emissions and to enable solutions that are only available if planned on community scale. This is closely linked but distinct from the requirements in the Ontario Building Code which speak to the individual building's specific requirements. For example, district energy is most efficient and cost effective when accounted for along with the other utility plans. Another example is that currently there are limitations on the electrical grid infrastructure's capacity to connect to local renewable energy sources, which limits the number of solar panel equipped homes which may be constructed in any given area.

Community Energy Plans are nested to align with the City's planning policy framework, with increasing specificity, as shown in Figure 1.

- Energy Evolution is Ottawa's municipal-scale CEP for energy use and carbon emissions across all sectors of the community.
- CEPs for new greenfield communities on urban expansion lands as well as within redevelopment areas require a more focused analysis of energy are carried out as part of Community Design Plans and Official Plan Amendments known as Local Plans (including both Secondary Plans and Area-Specific Policies, whichever applies).
- The land use, design and energy plans developed in support of new Plans of Subdivision will assess the energy and infrastructure plans with more detailed plans for individual communities.
- The most specific level of detail is to be provided by building energy models, which will be reviewed as part of Site Plan applications, consistent with the High Performance Development Standard.

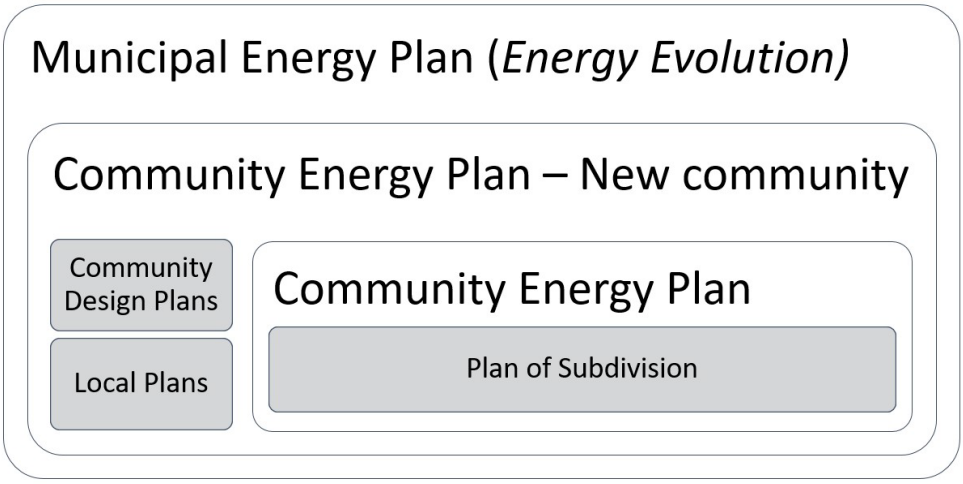

Figure 1 Nesting of Community Energy Plans

Climate Change Master Plan

In January 2020, Council approved the Climate Change Master Plan (CCMP) which establishes the framework for how Ottawa will mitigate and adapt to climate change over the next three decades. The vision of the CCMP is to take unprecedented, collective action that transitions Ottawa to a clean, renewable and resilient city by 2050. It sets guiding principles, goals, greenhouse gas (GHG) emission reduction targets, and eight priority actions for the next five years (2020-2025) that can be embedded into City business. The CCMP provides the framework for actions that address both mitigation and adaptation.

Figure 2 below illustrates Ottawa's short, mid and long-term community targets to reduce GHG emissions 100 per cent, below 2012 levels by 2050. These targets are in line with the Intergovernmental Panel on Climate Change's recommendation to limit global warming increases to 1.5ºC.

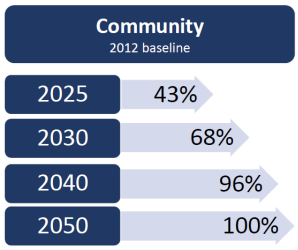

Figure 2: Community GHG reduction targets (CCMP, 2020)

Energy Evolution

Implementing Energy Evolution (Ottawa's Community Energy Transition Strategy) is another important priority action within the CCMP. The strategy responds to Council's directive to identify the scale of change and investment required to achieve Council's long-term GHG reduction targets. It acknowledges that achieving these targets will require concerted efforts and collaboration across all sectors of society. Energy Evolution was approved by City Council in October 2020.

Energy Evolution used a comprehensive energy, emissions and finance model to identify what it will take to achieve the 100 per cent by 2050 target in five key sectors: Land Use and Growth Management, Buildings (New and Existing), Transportation, Waste and Renewable Natural Gas, and Electricity.

In 2019, commercial buildings, residential buildings, and transportation sectors were responsible for the majority of Ottawa's emissions, contributing 90% of total emissions. Natural gas was the biggest source of emissions within the buildings sector, accounting for 84 per cent of total sector emissions. Gasoline consumption accounted for roughly 59 per cent of total transportation sector emissions.

In order to achieve the 100 per cent scenario, the model identifies the need to greatly reduce energy demand through conservation and efficiency and that:

- All fossil fuels will have to be phased out.
- Heating and transportation systems will have to be fully electrified or transition to zero emission.
- Waste heat utilization and renewable natural gas production will have to be added.
- Sufficient renewable electricity (mostly wind and solar) generation and electricity storage will be required to meet demand and offset emissions on the provincial electrical grid.

The strategy includes 20 projects over the next five years (2020-2025) to accelerate and scale action and investment towards the achievement of the 100 per cent scenario. Two projects have particular relevance to the Community Energy Plan requirements, including:

1. Integration of energy and climate mitigation policies into the new Official Plan and supporting master plans; and
2. Development of a High Performance Development Standard for Ottawa

Ottawa's Comprehensive Official Plan

Integrating climate change within the new Official Plan and its supporting documents is another priority action of the CCMP. Ottawa's new Official Plan was adopted by City Council in October 2021 and submitted to the Ministry of Municipal Affairs and Housing for approval in December 2021. The Official Plan is a legal document, adopted under the authority of the Ontario Planning Act. It contains the City's goals, objectives, and policies to guide growth and manage physical change to 2046.

Within the Official Plan are five broad policy directions (known as the five "Big Moves") which set the foundation for Ottawa to become the most liveable mid-sized city in North America over the next century. Ottawa's growth will need to align with Council approved greenhouse gas emissions reduction targets and take steps to adapt to a changing climate.

The Five Big Moves are important for the city to respond to climate change as follows:

Big Policy Move 1: Achieve, by the end of the planning period, more growth by regeneration than by greenfield development.

- The approved growth management strategy sets a target of 51 per cent of all urban growth to be accommodated in the built-up area through intensification, and 49 per cent through greenfield development over the course of the planning period to 2046.

Big Policy Move 2: By 2046, the majority of trips in the City will be made by sustainable transportation.

- The Official Plan introduces the concept of a built environment that comprise compact, 15-minute neighbourhoods that will help reduce emissions from transportation by increasing viable options for walking and cycling and promote social, mental and physical health and sustainable neighbourhoods, and;
- The approval of new greenfield communities within the urban expansion areas are to be conditional upon a Council-approved funding source and/or legal funding mechanism for any necessary transit network extensions or improvements as well as any major upgrades to municipal infrastructure such as water, wastewater and stormwater services.

Big Policy Move 3: Improve our sophistication in urban and community design and put this knowledge to the service of good urbanism at all scales, from the largest to the very small.

- Taking energy conservation and efficiency into account early in the design stages as part of site and community planning helps gain a foothold on achieving building energy performance targets. Through tools such as the High Performance Development Standard, new buildings designed to be energy efficient from the outset will help to reduce new buildings share of the city's greenhouse gas emissions and save on costly retrofits in the future.

Big Policy Move 4: Embed environmental, climate and health resiliency and energy into the framework of our planning policies.

- Climate change mitigation and adaptation, and healthy communities are integrated into the policy fabric of the Official Plan as a cross cutting issues. The Official Plan requires the development of healthy and resilient communities through establishing the built and natural environment conditions that are needed to sustain long-term health.

Big Policy Move 5: Embed economic development into the framework of our planning policies.

- New types of employment can also be anticipated in support of the City's transition to a low carbon economy. This includes new sectors in the construction industry working towards higher performance new buildings and deep energy retrofits. Large-scale renewable energy projects, particularly solar photovoltaic, energy storage and district energy, are expected to grow significantly over time.

In support of Council's established long-term target to reduce carbon emissions 100% by 2050, the Official Plan has set out two new studies to be required through the development approvals process:

1. Energy Modeling Report for Site Plan Control applications; and
2. Community Energy Plan for Local Plans and Plan of Subdivision applications.

The authority to require supporting plans and studies as part of a complete application is enabled by the Planning Act with reference to those documents in an approved Official Plan.

Energy Evolution found that transportation makes up approximately 45% of the city's emissions. Through the Official Plan and the associated Transportation Master Plan, the City will plan a transportation network that prioritizes sustainable modes over private vehicles, based on the opportunities for mode shifts presented within each Transect

area context. Policies that support fewer transportation emissions for new communities is also by targeting growth near rapid transit stations within Hubs and Corridors and within adjacent Neighbourhood designations described as “15-minute neighbourhoods”. Greenfield areas are also intended to be designed as complete 15-minute communities. The Community Energy Plan will therefore largely be focused on emissions related to building operations and enabling the electrification of personal or shared community vehicles.

High Performance Development Standard

Municipalities have legislative authority to examine matters of exterior design and their sustainable design under the Planning Act; primarily through Section 41 (Site Plan Control) as well as Section 51 (Plan of Subdivision). Similar to other municipal green development standards, Ottawa’s proposed High Performance Development Standard (HPDS) is intended to advance “sustainable and resilient design” measures. The Official Plan defines “sustainable and resilient design” as: *“Principles in site and building design to protect against the depletion of critical resources like energy, water, land, and raw materials, reduce greenhouse gas emissions, prevent environmental degradation throughout its life cycle, and create built environments that are livable and comfortable while being safe and resilient to the impacts of a changing climate”*.

The HPDS will have two tiers: The first tier is mandatory for all projects and the second tier is incentivized. There are twelve (12) categories of the HPDS for Site Plan applications and three (3) categories for Plan of Subdivision applications:

Site Plan applications – Tier 1		**Plan of Subdivision / Local Plan Tier 1**	
1.1	Building Energy Efficiency (Energy Modeling Report)	1.1	Community Energy Plan
1.2	Site Plan Accessibility	1.2	Tree Planting
1.3	Fresh Air Intake	1.3	Plant Species
1.4	Tree Planting		
1.5	Plant Species		
1.6	Exterior Lighting		
1.7	Bird-Safe Design		
1.8	Sustainable Roofing		
1.9	Cool Landscape and Paving		
1.10	Common Area Waste Storage		
1.11	Electric Vehicle Parking		
1.12	Bicycle Access and Storage		

Community Energy Plans are included in the HPDS to address energy efficiency and energy supply in the design of new communities, specifically in the design of new subdivisions and local plans. **Projects are to submit a Community Energy Plan demonstrating a proposed approach to energy or commit to a prescriptive approach to energy in line with the HPDS Tier 1 or Tier 2 targets as outlined in Appendix A (page 25) and B (page 26).**

Energy use is dictated by both land use planning decisions as well as specific criteria set out in the Ontario Building Code. Building energy requirements in the HPDS are proven through a preliminary energy model for site plans or a CEP in the case of a local plan or plan of subdivision. These tools aim to direct exterior and servicing strategies over interior ones addressed in Building Code. However, in order to achieve the Tier 1 energy efficiency requirements an applicant may elect to address the minimum performance requirements to include interior, exterior, or servicing strategies, or a combination therein. When developing a CEP, it is likely building designs will not be detailed enough to address the energy efficiency strategies proposed. This is why the CEP will include a section addressing how the applicant proposes to implement and monitor the CEP's strategies and targets.

The HPDS does not overrule the Ontario Building Code, nor speak to specific construction technologies that are covered under the Building Code. This is important as it distinguishes the line between standards related to site design and standards required under the Building Code.

Exterior site plan design elements that impact building energy performance can include:

- building orientation and site layout
- building articulation
- window size and amount of framing
- wall thickness and lot lines
- energy source
- parking layout (interior parking will create ventilation and lighting energy demand that don't exist with exterior parking)
- exterior lighting layout and requirements

The Community Energy Plan process helps to ensure communities are equipped with the infrastructure necessary to move toward near zero emissions. The CEP helps to identify solutions that are only available if planned at the community scale. For example, district energy as an efficient and cost-effective solution must be planned and accounted for at the community scale. The community scale is useful in addressing challenges such as, the limitations on the electrical grid's capacity to accommodate renewable energy from new homes in a specific area.

Climate Projections for the National Capital Region

The Climate Projections for the National Capital Region study was developed in partnership with the National Capital Commission and Environment and Climate Change Canada. It used advanced climate science modeling to predict changes in temperature, precipitation, wind and extreme weather until the year 2100. This data can help Ottawa prepare for the changing climate through considering these anticipated changes in design, construction and operation decision.

1.2 Objectives

Informed by the City's recent policy directions on climate change, Community Energy Plans (CEP) will seek to identify on-site and off-site measures to be undertaken by a developer, utility or other partners, to align the energy systems with City goals as the development is built. CEPs support the City's goal of reducing GHGs and responding to current and future effects of climate change as expressed in the Official Plan and Climate Change Master Plan by:

- Evaluating the consistency of a proposed development's energy characteristics with City climate change goals and policies;
- Encourage negotiations between stakeholders about the planning and budgeting for utility network and other energy system modifications, upgrades and servicing;
- Facilitating the implementation of preferred energy targets and measures as a condition of development approval

A CEP does not intend to predict actual energy use of the community. A CEP provides a quantitative understanding of the expected energy needs of a proposed development site using estimates to evaluate options on how to mitigate negative impacts. A CEP considers energy efficient, resilient, and low carbon strategies with near net zero emissions being the ultimate objective.

2. Preparation:

The Community Energy Plan document includes a community energy analysis, alongside mitigation measures, and other associated information. The community energy analysis refers to the overall assessment process to identify on and off-site measures to align the design of the development with City climate objectives.

The Community Energy Plan should be signed by a licensed professional engineer, a licensed architect, a full member of the Canadian Institute of Planners, a certified energy advisor, or other qualified professional with supporting description demonstrating experience/expertise with the applicable work (e.g. a minimum of three years in modelling energy use and greenhouse gas emissions in buildings and communities).

2.1 Process steps

The City of Ottawa encourages collaboration amongst stakeholders and development partners. The CEP will be required to:

- Assess the energy needs of the community and the impacts of the development,
- Review energy consumption and carbon emission mitigation options and strategies, measure current performance and future energy and emission performance, where energy measures are adopted,
- Be submitted to the municipality for approval,
- Be monitored through its implementation with reporting back to the City as part of the Local Plan approval, and by way of a legal agreement with the City for Plans of Subdivision.

3. When is a Community Energy Plan is Required?

1. A Community Energy Plan, prepared in accordance with this Terms of Reference, is required to be submitted for:

    a. An area of the city being reviewed as part of a Community Design Plan or as part of a new or amended Local Plan, as described in Section 12 of the new Official Plan; or

    b. A Draft Plan of Subdivision application within an existing approved Community Design Plan or Secondary Plan area without an approved CEP.

2. A Community Energy Plan "Brief" may be submitted in lieu of a Community Energy Plan under the following conditions:

    a. A Draft Plan of Subdivision application within an existing approved Secondary Plan area with an approved CEP.

    In such cases, a complete energy analysis is not required. The CEP Brief shall summarize the strategy for the development, how it aligns with the approved community design plan or secondary plan, and the approved CEP.

    b. A draft plan of subdivision application under 20,000 square metres of estimated gross floor area (GFA) but without an approved CEP.

    Development of a joint working group is not required for projects under this scenario (see Section 4.6). In such cases, the proponent may commit to a prescriptive compliance pathway in lieu of completing a Community Energy Plan. Prescriptive pathways for Tier 1 and 2 projects are outlined in the High Performance Development Standard and provided in Appendix A. The CEP Brief shall describe:

    1. How the project meets the size 20,000 square metres estimated GFA threshold; and
    2. How the project complies with the requirements outlined in Appendix A.

    For both 2(a) and 2(b) above, when the development moves to the detailed engineering stage, a more detailed report is provided, to be completed in conjunction with the composite utility plan and detailed design of the infrastructure. If the project doesn't completely align with the existing approved CEP, equivalency must be demonstrated and approval from the CEP working

group provided to ensure changes don't conflict with or adversely impact the implementation of the existing approved CEP by other landowners or partners. Community Energy Plan Reports and Briefs to be completed by qualified professionals as per the Preparation section of this document.

4. What is included in a Community Energy Plan?

A Community Energy Plan should include the content below and any other applicable items identified following the pre-application consultation meeting. Failure to satisfy these components may result in deeming the application incomplete. Where the information has been provided in an accompanying submission document, the CEP may reference the associated document to eliminate redundancies.

4.1 Description of Proposed Development

Prepare a description of the proposed development, including:

- Existing land uses or permitted use provisions in the Official Plan, Zoning By law, etc;
- Land uses and relevant planning regulations to be used in the analysis;
- Location of proposed buildings and size (including number of units if known);
- Planned phasing of development;
- Estimated dates of occupancy

4.2. Existing Context

This section will form the baseline for the CEP. It will include a review of the existing context of the site and surrounding area such as:

- Landforms and uses
- Road and street network
- Transit network
- Bicycle and pedestrian network
- Energy network and local energy resources
- Existing energy use and GHG Emissions

This section is likely limited in greenfield development scenarios. Projects should consider neighbouring existing properties to maximize opportunities to connect transit and low carbon energy networks and resources.

4.3. Objectives

Identify the overall objective of the Community Energy Plan. This should be informed by and include a summary of consultations, background analysis and policy context as applicable. This section will include a description of applicable sustainability goals, policies and targets as outlined in Provincial and Municipal policy documents. If applicable, the applicant's corporate, and utility policies and targets should be included.

4.4. Partners

This section will name the project partners as it relates to the development. This may include developers, builder/construction partners, and consultants such as, engineers, architects, planners and energy advisors.

4.5. Data sources and methodology

All projects are to use verified sources for assumptions. Provide data sources and assumptions. Standard references include:

- Emission factors for Part 9 and Part 3 buildings referenced in the Ontario Building Code SB-10 Table 1.1.2.2 CO^2e Emission Factors.
- Weather files/ assumptions projects to referenced in the Ontario Building Code local weather data.
- With regard to climate resiliency, reference the City of Ottawa's climate projections for 2100 as the basis for the analysis.

4.6. Consultations & Joint Working Group

This section will summarize the industry and public consultations which were completed as part of the CEP. The CEP shall form a part of the overall public consultation for the development project. At a minimum, consultation with industry shall include discussions with local utilities including district energy options. Additional considerations include:

- Utilities: Through consultation with the utilities, identify grid constraints (if any) that might limit the deployment of EVs, on-site renewables, or any other strategies.
- District energy providers: Document consultations with district energy providers with respect to draft plan-scale low carbon district energy systems employing, for instance, ambient loops.
- Low-emission technology providers: Document consultations with technology providers that would be part of a near zero emissions strategy. For example, cold

climate heat pump (CCHP) manufacturers, high performance window manufacturers, exterior insulation manufacturers etc.
- Conservation Authorities.

A Joint Working Group will be established to consider infrastructure issues associated with neighbouring land agreements associated with energy, fuel switching, microgrids, community/local energy storage, electric vehicles, and district energy (in addition to immediate issues like trenching). The working group will identify:

- Objectives
- Measures being considered and their energy emissions reductions
- Understand the utility infrastructure requirements
- Incentives

4.7. Energy Use and Carbon Emissions

This section will supply the details of energy use and carbon emissions in the new community. It is broken out into three parts; 1) proposed scenario, 2) analysis, and 3) implementation measurement and monitoring. The level of detail in this section will be dependent on the stage in planning the project is in.

Should a project not wish to complete community level analysis, an option to commit to prescriptive building targets exists. The prescriptive options are provided in APPENDIX A. In this case the CEP may skip the analysis section and only complete the proposed scenario and implementation sections.

i. Proposed Scenario

This section will:

- Describe the proposed targets for the community
- Identify the mitigation and resiliency strategies to achieve the Proposed Scenario
- Describe how the proposed scenario aligns with Energy Evolution, the Municipal Energy Plan

The proposed scenario should consider servicing limitations such as available capacity, rules, and requirements. The project's utility servicing capacity and plans should reflect the proposed scenario. At this stage it is understood that many of the building design specifics will not be finalized, the plan should reflect this limitation but may set out design targets for the buildings, where possible and applicable.

Possible mitigation and adaptation strategies may include:

- Design walkable, connected communities
- Optimize Building and block configuration
- Optimize Solar Orientation and access
- Consider district energy and geothermal energy systems at the site level.
- Improve building envelope insulation and airtightness
- Adopt high performance windows and other glazed areas
- Adopt passive approaches to cooling and heat mitigation ie; operable windows, shading, trees, reflective materials
- Adopt high performance/near zero-emission heating and cooling system.
- Adopt efficient exterior lighting systems
- Improve Solar shading, such as extended rooftop overhangs or other external shading devices
- Adopt on-site renewable energy generation
- Adoption of Solar/PV-ready
- Adopt EV-ready measures
- Install EV charging stations for buildings and parking lots
- Consider electrical service capacity in relation to electric heating and cooling appliances, electric vehicle charging and renewable energy needs. For example, energy storage and upgraded electricity distribution.
- Adopt on-site back-up power
- Adopt on-site household waste management systems
- Opportunities to address carbon emissions through carbon sequestration
- Strategies in place to reduce high carbon materials such as concrete, steel, masonry with low carbon choices such as (wood)

ii. Analysis

This section is where projects will explore energy use and emission scenarios as well as risks and opportunities.

Energy and emissions associated with new community development come primarily from buildings and transportation. Emissions are influenced by four principal areas:

1. Community Infrastructure – including:
    a. Energy Sources
    b. Transportation Network
    c. Passive Energy strategies incorporated into street network designs
2. Building design
3. Occupant behavior during use and operations of the building
4. Embedded and Embodied Carbon- carbon emissions and sequestration associated with construction materials.

While the focus of the analysis section will be on community infrastructure and building design, some consideration of occupant behavior and embedded and embodied carbon is expected. Occupant behavior is outside the builder's control but, plans should still take occupant behaviors into consideration. In general, simple design solutions are encouraged to minimize the need for specialized knowledge in order to operate and maintain all buildings and, in particular, homes. In addition, there may be design solutions which can influence occupant behavior that the plan chooses to incorporate or address.

Embodied carbon is recognized as a large opportunity for addressing emissions in new subdivisions but, may be more difficult to quantify through modeling. Embodied carbon analysis should be provided if it is selected as a mitigation strategy.

The energy analysis will look at both energy emission scenarios to mitigate impacts of climate change, and energy resiliency strategies.

a. Targets and Scenarios

Projects must compare the proposed scenario to three reference scenarios that are informed by Ottawa's Energy Evolution model data (see Resources / Background). The Energy Evolution model compares a Business as Planned (BAP) scenario with a target scenario to eliminate community emissions by 2050, which was approved by City Council in January 2020. The BAP scenario illustrates the anticipated energy use and emissions in Ottawa if no additional policies, actions, or strategies are implemented beyond those already planned or underway as of 2020.

Project proponents must identify how their proposed scenario aligns or compares to the following three reference scenarios. Tier 2 projects must demonstrate performance equal to or higher than Scenario 2. Details below provide guidance to inform the reference models:

Scenario 1: Business As Planned Scenario

The Business As Planned Scenario estimates 1,175kg equivalent annual CO_2 emissions added for every new home. Household energy for Ottawa's baseline year 2016 is estimated at 105.56GJ/household declining down to 65.93 GJ/household by 2050.

Scenario 2: 50% Emissions Reduction Scenario

The Energy Evolution Model to 2050 reduces emissions 50% from the Business As Planned scenario to 587kg equivalent annual CO_2 emissions per new home between 2020 and 2030.

Scenario 3: Near Zero Emissions Scenario

The Energy Evolution target scenario calls for near zero emissions for every new home built after 2030. Household energy use in this scenario is expected to reduce to 23.43 GJ/household in the target scenario, this consumption is offset by local renewable energy generation to achieve near zero emissions.

b. Energy Resiliency

Evaluate the project's energy system's risks to future climate conditions including

- Increasing temperature, precipitation and extreme events
- location of energy infrastructure with respect to flood risk areas
- considerations for change in peaks, and types of demand due to changing climate

iii. Implementation Measurement and Monitoring

This section will address implementation, measurement construction monitoring of the CEP. This section will outline how consistency with the community energy plan will be evaluated on the building level. How this is done will vary depending on the proposed targets, and ownership business model for the project. Possible strategies to consider include:

- Commitment to complete energy models to verify consistency with proposed targets
- Commitment to a prescriptive list of measures that are evaluated through a sample energy model or other means
- Agreements on title as part of agreement of purchase and sale may be a necessary tool where the builder and land developer are distinct entities.
- Where a district energy system, or partnership with another utility is planned, considerations around roles, responsibilities and phasing should be addressed.
- Where possible operational monitoring of community level energy consumption is encouraged through agreements with utility providers to report on aggregate energy consumption of the community.

5. What are the Evaluation Criteria?

The CEP will be evaluated by the net increase in community emissions associated with the proposed development, to be summarized as follows:

1. How the proposed community energy demands, and associated emissions compare to the City's climate target scenario. The Municipal Energy Plan lays out energy intensities for new homes and buildings in a business as planned and a target scenario. These energy intensities are provided in the table in Appendix B.
2. The extent to which active transportation and transit (mode shares) have been maximized
3. Amount of on-site generation and district energy options including but not limited to solar, wind, water, biomass, and geothermal energy. Energy Evolution aims to see:
    a. 1060 MW residential solar power generation by 2050 for new residential buildings, this translates to about 15 panels per new home
    b. An estimated 740MW commercial solar power generation by 2050.
    c. 23,394 homes served by DE by 2050 and 8,091,053 square metres of non-residential floorspace served by DE by 2050
    d. District energy is understood to have high potential in areas with heating energy demand density of 113 MJ/ha or higher. This target energy density may vary due to site efficiencies or limitations.
    e. See Appendix B for TEDI, TEUI and GHGI targets.
4. The project's Implementation and Monitoring approach is robust and achievable.
5. In general, off-site strategies such as renewable energy credits are not expected to form part of the project's Community Energy Plan. If a case can be made for inclusion of offsite strategies, it may be considered.

6. Submission:

Final Digital Copies will include the following as applicable:

- Community Energy Plan Report

  OR

- Community Energy Plan Brief

7. Resources/ Background

Reference Materials

1. The Energy Evolution Strategy and supporting documents can be found here including Energy Evolution Technical Report (the Municipal Energy Plan)

2. National Capital Region Climate Projections can be found here.

Related Studies

1. Wastewater Energy Transfer Survey

   Thermal energy from the wastewater system can be used as a zero carbon energy source for heating and cooling buildings. The City is undertaking a wastewater energy transfer survey to inform opportunities for thermal energy capture that may be used for useful purposes such as district or building heating and cooling. When this survey is available this document will be updated with a link as this may be a helpful resource for projects looking for available thermal energy resources.

2. Geothermal Potential Survey

   Geothermal energy can be used as a zero carbon energy source for heating and cooling buildings. The City is undertaking a geothermal potential survey to inform opportunities for geothermal energy for purposes such as district or building heating and cooling. Early results suggest that the western half of the municipality, west of the Carlsbad Formation, provide the most likely opportunities for geothermal energy applications. The full survey is expected to be available in Q3 of 2021 at which point this document will be updated with a link.

Examples of other Community Energy Plans

Zibi One Planet Action Plan- City of Ottawa

Weston Community Energy Plan - City of Vaughan

A reference list of active and past Community Energy Plans will be made available as they become part of the subdivision process.

7. Contact

Please contact Energy Evolution at energyevolution@ottawa.ca for further information about meeting the High Performance Development Standard energy performance measures, or the contents of Community Energy Plan submissions.

8. Definitions

Building articulation: the layout or pattern, expression and material character of building elements, including walls, doors, roofs, windows, and decorative elements such as cornices and belt courses.

Building envelope: the building elements separating interior space from the outdoors such as exterior walls, windows, and roof.

Building orientation: the cardinal (north south east west) direction of a building

Business as Planned (BAP): description of a scenario assuming no change to current path or behavior

Canadian Home Builders Association Net Zero Energy or Net Zero Energy Ready: home labelling program for homes that are designed to produce as much energy as they consume

Carbon sequestration: A method of capturing and storing CO2 so that it is not released into the atmosphere, thereby reducing GHG emissions. The CO2is compressed into a transportable form, moved by pipeline or tanker, and stored in some medium, such as a deep geological formation.

Community Energy Plan (CEP): A plan that identifies pathways and sets objectives and targets on energy and greenhouse gas emissions in support of sustainable and resilient design at the new community scale of development. This may include building energy use and source, wastewater, solid waste and transportation design solutions.

District Energy: District energy is the production and supply of thermal energy.

Electric Vehicles (EV): are powered by motors that draw electricity from on-board storage batteries. Electric vehicles are plugged-in to be recharged.

Embodied carbon: is the carbon dioxide (CO_2) emissions associated with materials and construction processes throughout the whole lifecycle of a building or infrastructure

Energy Use Intensity (EUI): energy use for a building divided by the gross floor area

Energy Star for New Homes: a home certification program targeting 20 precent energy improvement over local building code

Generation (electricity): The process of producing electric energy by transforming other forms of energy. Also, the amount of energy produced.

Geothermal energy: The use of geothermal heat from the earth's molten core to generate electricity. Also used to describe ground-source heating and cooling (also known as geo-exchange or ground-source heat pump).

Greenhouse gas (GHG): A gas such as carbon dioxide, methane, or nitrogen oxide, which actively contributes to the atmospheric greenhouse effect. Greenhouse gases also include gases generated through industrial processes, such as hydroflurocarbons, perflurocarbons and sulphur hexafluoride.

Greenhouse Gas Intensity (GHGI): Greenhouse gas emissions associated with the energy to operate a building divided by the gross floor area

Grid-scale battery storage: A type of energy storage system that collects energy from the electrical grid or a power plant using electrochemical cells, then discharges energy to provide electricity or other grid services when needed.

Gross Floor Area (GFA): The total area of each floor whether located above, at or below grade, measured from the interiors of outside walls and including floor area occupied by interior walls and floor area created by bay windows, with exclusions as outlined in Ottawa's Zoning By-law 2008-250;

High Performance Development Standard (HPDS): Sets performance targets for new construction to improve air and water quality, reduce greenhouse gas emissions and enhance the natural environment. Some of these targets can be directly achieved by incorporating sustainable and resilient design features into the plans and drawings submitted as part of the site plan approval process.

Low-carbon: less carbon dioxide emissions

Local Plan: Secondary plans and area-specific polices that provide more detailed policies to guide growth and change in specific areas or neighbourhoods. Local plans adapt and implement the overall planning approach of this Plan but may deviate from specific policies to fit local contexts.

Municipal Energy Plan (MEP): A Community Energy Plan completed at the municipal scale. For the City of Ottawa this is Energy Evolution

Net zero emissions: Refers to the balance of emitting and removing GHGs from the atmosphere, such that the net effect is zero emissions

One Planet Living Framework: a framework comprising ten simple sustainability principles and detailed goals and guidance. It is a highly flexible framework that is helping organizations around the world to achieve their vision of a brighter, better future living within the constraints of our planet's resources.

Ontario Building Code (OBC): The provincial law governing building construction practices

Passive: relating to or denoting heating systems that make use of incident sunlight as an energy source

Passive House: a building certification program with a focus on passive elements such as building insulation and orientation.

Proponent: a person or company who advocates a proposal, or project.

Quantitative: relating to a quality that is captured with numerical measurements

Qualitative: relating to a quality that cannot be measured numerically

Renewable energy source: an energy source that is renewed by natural processes and includes wind, water, biomass, biogas, biofuel, solar energy, geothermal energy and tidal forces.

Renewable energy system: means a system that generates electricity, heat and/or cooling from a renewable energy source.

Renewable natural gas (RNG): is natural gas that comes from renewable sources this could be comprised of either biogases refined to a quality that's acceptable for injection into the local pipeline grid or hydrogen or a mixture of the two.

Resiliency: refers to the capacity to adapt to changing climate conditions Secondary Plan

Servicing: the utility infrastructure supporting a development such as electricity, water or energy services.

Thermal Energy Demand Intensity (TEDI): energy required to heat and cool a building divided by the gross floor area

Solar orientation: the cardinal (north south east west) placement of an object particularly as it relates to capturing solar energy or heat

Waste heat: Energy lost during the operation of a piece of equipment or machinery. Various processes, such as cogeneration or combined heat and power (CHP) exist to capture and reuse waste heat.

Appendix A: Prescriptive Energy Path

As an alternate path to a Community Energy Plan, proponents may commit to **one or a combination** of the following building level energy performance pathways for the site's low rise home archetypes and commit to following the HPDS as required for any applicable commercial or multi unit residential buildings.

a) Total Energy Use Intensity (TEUI), Thermal Energy Demand Intensity (TEDI) and GHG Emission Intensity (GHGI) targets

	Tier 1			**Tier 2**		
	TEUI (kWh/m²/yr)	TEDI (kWh/m²/yr)	GHGI (kg CO_2^e/m²/yr)	TEUI (kWh/m²/yr)	TEDI (KWh/m²/yr)	GHGI (kg CO_2^e/m²/yr)
Residential units (≤6 Storeys)	147	62	19	108	38	13

b) Commitment to pursue approved certification program
Tier 1: ENERGY STAR® for New Homes, or equivalent,
Tier 2: Canadian Home Builders Association Net Zero Energy or Net Zero Energy Ready, Passive House, or equivalent

Certification programs are to be the current version as of date of submission following programs defined transition requirements if the submission falls within a version transition period. Equivalent programs to be approved by City documentation demonstrating equivalency with respect to carbon emission performance, integrity and verification to be provided for review.

c) Commitment to including 2 of the following Energy Conservation Measure Packages:

	Pick 2
i.min ext. wall effective R-value 20 (R19+5ci nominal)	☐
ii.electric heat pump heating and cooling system	☐
iii.Airtightness target aligned with Energy Star Level 3 with agreement to complete verification testing	☐
iv.Energy Star ZONE3 windows AND R10 underslab insulation	☐

Appendix B: *Energy Intensity Targets*

The following tables outline the estimated energy intensity target for different building archetypes based on a combination of resources including Energy Evolution projections and targets, historic modelling data, NRC research data and the Toronto Green Standard. These are not prescriptive requirements for new communities, this is to serve as a reference to help inform how closely a new community's CEP aligns with Energy Evolution. On-site solar energy production is included in the GHGI numbers but, not in the EUI.

New Home and Commercial Building Energy Targets under Business as Planned Scenario

Build Year:	2021			2025			2030+		
Dwelling Unit Type	EUI kWh/m²	TEDI kWh/m²	GHGI $kgCO2_e$ /m²	EUI kWh/m²	TEDI kWh/m²	GHGI $kgCO2_e$ /m²	EUI kWh/m²	TEDI kWh/m²	GHGI $kgCO2_e$ /m²
Single Detached	111	60	16	89	49	10	39	32	8
Townhouse	123	51	17	102	41	11	53	27	9
Apartment <6storeys	176	76	23	158	68	20	162	73	20

Build Year:	2021			2025			2030+		
Building Archetype	EUI kWh/m²	TEDI kWh/m²	GHGI $kgCO2_e$ /m²	EUI kWh/m²	TEDI kWh/m²	GHGI $kgCO2_e$ /m²	EUI kWh/m²	TEDI kWh/m²	GHGI $kgCO2_e$ /m²
MURB (≥ 4 Storeys)	181	81	23	162	33	13	147	66	19
Commercial Office	186	81	23	167	30	11	151	66	19
Commercial Retail	181	71	24	162	64	22	146	57	19

New Home and Commercial Building Energy Targets under Target Scenario

Build Year:	2021			2025			2030+		
Dwelling Unit Type	EUI kWh/m²	TEDI kWh/m²	GHGI $kgCO2_e$ /m²	EUI kWh/m²	TEDI kWh/m²	GHGI $kgCO2_e$ /m²	EUI kWh/m²	TEDI kWh/m²	GHGI $kgCO2_e$ /m²
Single Detached	106	56	12	46	15	2.3	39	15	0.3
Townhouse	119	48	13	62	15	3.1	53	15	0.4
Apartment <6storeys	147	62	19	108	38	16	70	15	5

Build Year:	2021			2025			2030+		
Building Archetype	EUI kWh/m²	TEDI kWh/m²	GHGI $kgCO2_e$ /m²	EUI kWh/m²	TEDI kWh/m²	GHGI $kgCO2_e$ /m²	EUI kWh/m²	TEDI kWh/m²	GHGI $kgCO2_e$ /m²
MURB (≥ 4 Storeys)	142	52	19	108	33	13	75	15	5
Commercial Office	142	42	19	108	30	11	65	15	4
Commercial Retail	132	52	12	98	33	7	70	15	3