

Energy Strategy Terms of Reference

Study	Energy Strategy Effective: May 2018
Description	<p>The purpose of the Energy Strategy is the early identification of opportunities to integrate local energy solutions that are efficient, low carbon and resilient. The findings will inform later studies including the Toronto Green Standard Energy Modelling Report. It will also inform the Renewable Energy Feasibility Study for all city agency, boards, commissions and divisions, where applicable.</p>
When Required	<p>The Energy Strategy applies to new development including residential, non-residential and/or mixed use and may apply to industrial development:</p> <ul style="list-style-type: none"> • with a total gross floor area of 20,000 square metres or more; or • within a Community Energy Plan area approved by Council <p>in association with the following application types:</p> <ul style="list-style-type: none"> • Official Plan Amendment; • Zoning By-Law Amendment; or • Plan of Subdivision
Rationale	<p>The Energy Strategy is intended to contribute to achieving the City's objectives to reduce energy consumption and GHG emissions and become more resilient. Official Plan policy 3.4.18 states that "innovative energy producing options, sustainable design and construction practises ... will be supported and encouraged in new development ... through: d) advanced energy conservation and efficiency technologies and processes that contribute towards an energy neutral built environment".</p> <p>Undertaking an Energy Strategy at the application stage for a Plan of Subdivision, Official Plan or Zoning Bylaw Amendment facilitates the following key outcomes:</p> <ul style="list-style-type: none"> • Opportunity to site buildings to take advantage of existing or proposed energy infrastructure, energy capture and/or solar orientation at the conceptual design stage. • Consideration of potential energy sharing for multi-building development and/or neighbouring existing/proposed developments. • Consideration of opportunities to increase resiliency such as strategic back-up power capacity (for multi-unit residential buildings). • Identification of innovative solutions to reduce energy consumption in new construction and retrofit of existing buildings (if part of new development). • Exploration of potential to attract private investment in energy sharing systems.
Required Contents	<p>This section presents minimum requirements for completion of the Energy Strategy and is not exhaustive. The applicant is encouraged to discuss the required contents with Environment & Energy Division staff prior to initiating the strategy.</p> <p style="text-align: center;">1. Towards Zero Emissions Development</p> <p>Calculate energy and emissions for the proposed development using the following scenarios:</p> <ul style="list-style-type: none"> • Baseline – Toronto Green Standard Version 3 Tier 1 • Higher Performance – Toronto Green Standard Version 3 Tier 2 • Near Zero Emissions – Toronto Green Standard Version 3 Tier 4

Required Contents

The scenarios should include opportunities for super-efficient building envelopes and building-scale renewables, as well as opportunities for shared energy services (i.e. low-carbon thermal energy networks).

a. Energy Conservation & Demand Reduction

Identify and evaluate opportunities to achieve **very low energy use intensities (EUIs)** and **reduced energy demands**, through:

- Building orientation and solar controls; thermal effectiveness of the building envelope; daylighting design strategies; and
- High efficiency mechanical systems (e.g. efficient HVAC systems, heat recovery, lighting solutions).

b. Low-Carbon Solutions

Identify and evaluate opportunities for low-carbon energy solutions **on-site** (i.e. within the proposed development site), and **off-site** through connection to nearby existing or planned buildings and infrastructure. This can include, but is not limited to:

- Renewables, such as rooftop solar PV, geo-exchange in a nearby park, and heat recovery from sewer lines;
- High efficiency combined heat and power (CHP);
- Connection to an existing thermal network;
- Rough-in for a future connection to nearby existing/in-development thermal energy networks (i.e. "district energy-ready"); and
- A new thermal network connecting several planned developments in an area.

For **multi-building** (i.e. campus-type) proposals, identify and evaluate opportunities for shared energy solutions that include, but are not limited to:

- Thermal energy distribution networks (i.e. piping) to connect buildings;
- Shared mechanical room(s) for heating and cooling equipment;
- Large-scale renewables such as lake water cooling, biomass, sewer heat and other means of waste heat recovery;
- High efficiency CHP;
- Thermal energy storage;
- Shared backup power system(s) for multiple buildings; and
- Micro-grid(s) with the ability to island from the electrical grid.

2. Energy Resilience

Identify and evaluate opportunities for **backup power systems** that will improve the resilience of buildings to area-wide power outages, especially for multi-unit residential buildings. This includes meeting all emergency power (life safety) requirements, as well as providing for 72 hours (at a minimum):

- Domestic water (hot and cold);
- Elevator service; and
- Space heating, lighting and receptacle power to the central common area/amenity space/lobby, where applicable.

3. Analysis, Preferred Scenario, and Recommendations

- a. Calculate energy consumption, demand, and emissions for the proposed development according to the three scenarios. Include in calculations the energy performance of existing buildings (if any are part of the development site) using available utility data.

<p>Required Contents</p>	<p>b. Estimate the contribution(s) of the identified on-site and off-site low-carbon solutions towards achieving zero emissions.</p> <p>c. Based on the completed analysis, state the preferred scenario and conclude with recommendations and next steps to facilitate implementation. Establish the overall value proposition(s).</p> <p>Format of the Report</p> <p>i. Executive summary</p> <p>ii. Energy calculations, including data and assumptions, for existing buildings and new development (soft copy spreadsheet – Microsoft Excel format)</p> <p>iii. Graphs of expected energy performance (Microsoft Excel format)</p> <p>iv. Conclusions / Recommendations</p> <p>v. Appendices: supporting documentation, references, etc.</p>
<p>Contact</p>	<p>For further information please contact: Environment & Energy Division – Energy Efficiency Office City of Toronto – Metro Hall 55 John Street, 2nd floor Toronto, ON M5V 3C6 416 392-1501 ceplan@toronto.ca</p>
<p>Reference Documents (Links)</p>	<p><u>Interactive map of City Council-approved Community Energy Planning Areas</u></p> <p><u>Minimum Backup Power Guidelines for Multi-Unit Residential Buildings</u></p> <p><u>District Energy (Thermal Network) Ready Guidelines</u></p> <p><u>Toronto Green Standard Tools and Resources</u></p> <ul style="list-style-type: none"> • <u>Energy Modelling Report Terms of Reference</u> • <u>Renewable Energy Policy for City Facilities</u>