

# Glossary

Base Case – a ‘business-as-usual’ projection of Brampton’s energy future.

Baseline – energy use or emissions at a certain point in time. A 2016 Baseline was chosen for the Community Energy and Emissions Reduction Plan to align with the 2016 Census.

Carbon Footprint – the amount of greenhouse gases (GHGs) released due to an activity, event, organization, person, etc., considering all relevant sources, sinks, and storage, and expressed as a carbon dioxide (CO<sub>2</sub>) equivalent. An individual or organization’s carbon footprint is the total amount of GHGs released from supporting their needs, lifestyle, and daily life choices.

Carbon neutrality – achieving net-zero carbon dioxide (CO<sub>2</sub>) emissions by balancing CO<sub>2</sub> emissions with CO<sub>2</sub> emissions removal, or eliminating CO<sub>2</sub> emissions altogether.

Carbon sinks and sequestration – the capture and storage of carbon dioxide (CO<sub>2</sub>), through means such as urban forestry, urban farming, green roofs, naturalization, and natural heritage conservation. This can result in other energy-related benefits like the ambient climatic effects that shade, solar energy reflection, and transpiration provide. Community energy planning often does not include measures that sequester CO<sub>2</sub> through green infrastructure.

Centralized Energy Systems – supply of energy through large-scale energy generation infrastructure that delivers energy via a vast distribution network, often far from the point of use.

Climate Mitigation – decreasing the human-induced sources of climate change to reduce future impacts, such as minimizing the amount of greenhouse gas (GHG)-emitting fossil fuels burned for energy or enhancing carbon sinks that store GHGs.

Cogeneration or Combined Heat and Power – an energy efficient technology that generates electricity and captures heat, which would otherwise be wasted (e.g. steam or hot water), to provide useful thermal energy that can be used for space heating, cooling, domestic hot water, and industrial processes. Combined heat and power systems produce electricity and thermal energy from a single fuel source (e.g. natural gas, biomass). When electricity is generated in large scale regional gas-fired power plants, as much as 60% of the energy value is lost, mostly as heat at the point of generation and the remainder during transmission. This inefficiency can be addressed by generating electricity within the community and capturing the heat for use in a district energy system.

Conversion (energy)/transformation – the process of changing one type of energy to another (e.g. wind (mechanical energy) to electricity, electricity to heat (thermal energy)). From energy source to site use, energy can undergo multiple transformations. During each energy conversion, an amount of energy is lost through heat (waste waste).

Community – in the context of community energy planning, the word “community” is meant to be inclusive of all people, groups, and stakeholders that share the common attribute of being inhabitants of Brampton and direct and indirect consumers of energy.

Community Energy Plan(ning) – a data-informed approach to understanding where and how energy is used and greenhouse gas (GHG) emissions released in a community to identify local opportunities and priorities for increasing energy efficiency, reducing GHG emissions, and lowering energy costs. The Community Energy and Emissions Reduction Plan is Brampton’s community energy plan.

Community Improvement Plan – a tool that allows a municipality to direct funds and implement policy initiatives toward a specifically defined area.

Community Task Force – a team of community champions and principal advisors for the Community Energy and Emissions Reduction Plan.

Decentralized/Distributed Energy Systems – small-scale energy generation, operation, and/or energy storage used to provide an alternative to or an enhancement of the traditional electric power grid.

Deep Decarbonization – measures to significantly reduce and/or sequester carbon dioxide (CO<sub>2</sub>) emissions, with an ultimate objective of zero carbon dioxide emissions.

District energy – supplying thermal energy (heating and/or cooling) to multiple buildings from a central plant or from several interconnected but distributed plants. Thermal energy is conveyed with water through a close network of pre-insulated pipes to meet end-users’ need for cooling, heating and domestic hot water. Historically, steam networks have been used and are still used in some older systems. A district energy system is comprised of three subsystems, which include the collection and/or generation of thermal energy, the distribution of that thermal energy from the plant(s) to end-users, and the transfer of the thermal energy to the energy consumer.

Efficiency Case – considers how different combinations of measures can impact the projection of Brampton’s energy future.

Energy Efficiency – using less energy to perform the same task and eliminating energy waste.

Energy Performance Labels – measure and display the energy efficiency and environmental impact (e.g. greenhouse gas emissions) of an item, such as a home, building, appliances, etc.

Energy Security – maintaining an adequate and resilient supply of energy (electricity, liquid fuel, and gas) while also addressing issues of affordability, accessibility, and reliability.

Energy Transition – a major and long term structural change in energy systems, often including a significant transformation in how energy is sourced, distributed, and/or utilized.

Framing Goals – established at the beginning of the analytical process of the CEERP, and used to evaluate the performance of the Base Case and Efficiency Case simulations.

Gigajoule (GJ) – a unit of measurement of energy. One gigajoule is equivalent to one billion joules.

Global Best Practice – method or technique that is generally accepted as superior to the alternatives because it produces results that are superior to those achieved by other means. For community energy planning, global best practice is achieved in Northern Europe/Nordic countries, where municipalities have taken the lead in developing and implementing community energy plans that result in order of magnitude improvements in energy efficiency and over 50% reductions in per capita GHG emissions.

Greenfield – undeveloped land, typically dominated by agriculture, open space, and or natural heritage features.

Greenhouse Gases (GHGs) – any gas that absorbs thermal radiation from the sun and emits it back into the earth’s atmosphere, such as include water vapour, carbon dioxide, methane, nitrous oxide, and ozone. Without them, the average temperature at the surface of our planet would be around -18°C rather than 15°C.

Home and Building – Homes refers to all residential buildings. Buildings refer to all other types of building structures (e.g. commercial, facilities, institutional, storage, business etc.)

Integrated Energy Master Plan (IEMP) – the equivalent of a Community Energy and Emissions Reduction Plan but developed at the scale of a portfolio of properties, neighbourhood, or subdivision.

Latest Energy Transition – the current energy transition underway being driven by the decarbonization and the localized distribution of energy.

Modal Split – the percentage share of travelers or goods using a particular type of transportation type, or the number of trips using said type (e.g. 10% cycling, 50% single-passenger car, 5% walking, 35% transit).

Near-net-zero (NNZ) Neighbourhood – areas where little or no energy is drawn from the electricity grid or from pipelines, and little or no greenhouse gas (GHG) emissions are released.

Non-GHG Emitting Sources – sources of energy that do not produce greenhouse gas (GHG) (e.g. nuclear, hydro, wind, solar, geothermal).

Project Working Team – comprised of representatives from the City of Brampton, Sheridan College, and the consulting team led by Garforth International LLC, and headed the analytical and engagement processes for the CEERP.

Provincial Growth Plan – the Growth Plan for the Great Golden Horseshoe establishes population and employment targets for 2041 for all municipalities within the region. Municipal official plans must be in conformity with these targets.

Resiliency – the ability to prepare for, absorb, and recover from future shocks (economic, environmental, social, and institutional). Resilient cities promote sustainable development, well-being, and inclusive growth. The CEERP contributes to overall community resiliency by addressing increasing consumer concerns about energy affordability, accessibility, and reliability.

Site Energy – considers the energy use at the meter by end-users (e.g. homes, buildings, industry, and transportation).

Source Energy – considers all energy flows from production to end-use.

Standardized Retrofits – a consistent set of modifications to existing buildings designed to improve energy efficiency or decrease energy demand.

Sustainability – meeting the needs of the present without compromising the ability of future generations by creating and maintaining the conditions under which people (social), economies (economic), and the environment (environment) can exist in productive harmony.

Thermal Utility - a district energy network is typically run as a thermal utility by a company that operates all the plants and networks, ensures service quality, and manages the metering and billing of the heating and cooling services. The network allows for economies of scale, since the generation of heat in a few larger plants is more efficient than having many boilers, each heating their individual building. It also enables valuable energy currently wasted in electricity generation, as well as industrial and other processes to be cheaply captured and delivered to other consumers.

Tonne – a metric tonne, equivalent to 1000 kilograms (kg) or 2204.6 pounds (lbs).

Transmission (energy) – the movement or delivery of energy from its point of generation to point of consumer/site use, and usually referring to the transmission of electricity across specialized cables or structures.

Urbanization – the growth of cities and towns driven by a rise of population and the increasing share of people living in urban centers.

Urban Centre – an urban area with a high population density.