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Niagara Region Community Energy Plan (CEP)

Baseline Energy and GHG Emissions Study

Date: October 2nd, 2026

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Table of Contents

List of Acronyms 3
Units of Measurement 4
Executive Summary 5
Key Baseline Findings 5
From Baseline to Community Energy Plan 6
1. Introduction and Study Context 8
1.1 Document Purpose 8
1.2 Baseline Year and Inclusion Protocol 8
1.3 Niagara's Energy Supply 9
1.4 Data Collection Process, Assumptions and Limitations 15
2. Energy and Emissions Results 16
2.1 By Fuel Source 17
2.2 By Category 19
2.3 By Local Area Municipality (LAM) 22
2.4 Stationary Energy and Emissions Maps 24
2.5 Distributed Energy Resources in Niagara 29
2.6 Energy Spend in Niagara 33
2.7 Benchmarking 35
2.8 Additional Context and Planning Indicators 38
3. Baseline Study Insights and Next Steps 44
3.1 Key Insights for CEP Development 44
3.2 Integration of Existing Plans and Studies into CEP Development 45
3.3 Engagement and Collaborative Development of the CEP 46
3.4 Next Steps and CEP Development Process 47
Appendices 49
Appendix A – Data Sources, Methodologies and Assumptions 49
Appendix B – Conversions and Factors 53
Appendix C – Annotated Inventory of Reviewed Plans and Studies 55

List of Figures

Figure 1 - Ontario Electricity Generation (TWh) by Source, 2024 10
Figure 2 - OEB LDC Service Area Map 11
Figure 3 - Energy Consumption (PJ) by Fuel Source 18
Figure 4 - GHG Emissions (ktCO2e) by Fuel Source 18
Figure 5 - Energy Consumption (PJ) by Category 20
Figure 6 - GHG Emissions (ktCO2e) by Category 21
Figure 7 - Total and Per Capita Energy Consumption (GJ) by LAM 23
Figure 8 - Total and Per Capita GHG Emissions (tCO2e) by LAM 23
Figure 9 - Map: Total Energy (GJ) by FSA 26
Figure 10 - Map: Total Emissions (tCO2e) by FSA 26
Figure 11 - Map: Residential Energy per Dwelling (GJ/Dwelling) 27
Figure 12 - Map: Residential Emissions per Dwelling (tCO2e/Dwelling) 27
Figure 13 - Map: Non-Residential Energy Density (TJ/km2) 28
Figure 14 - Map: Non-Residential Emissions Density (tCO2e/km2) 28
Figure 15 - Net-Metered - Cumulative Installed Capacity (kW) by LDC 30
Figure 16 - Embedded Generation - Cumulative Installed Capacity (kW) by LDC 31
Figure 17 - Embedded Generation Capacity (kW) by Type 32
Figure 18 - Est. Annual Community Energy Expenditure ($millions) by Fuel Type 34
Figure 19 - EV Index Niagara Region EV Adoption and Public Charging Map 41
Figure 20 - Key Baseline Study Insights 45

List of Tables

Table 1 - Local Distribution Companies in Niagara 11
Table 2 - Energy and Emissions Summary 17
Table 3 - Energy and Emissions Benchmarks 37
Table 4 - SC and WG Composition and Roles 46
Table 5 - CEP Development Stages and Timing 47

List of Acronyms

CEP - Community Energy Plan

CER - Canada Energy Regulator

CHP - Combined Heat and Power

CNG - Compressed Natural Gas

CNP - Canadian Niagara Power

DER - Distributed Energy Resource

EV / BEV / PHEV - Electric Vehicle / Battery Electric Vehicle / Plug-in Hybrid Electric Vehicle

FIT / microFIT - Feed-in Tariff / micro Feed-in Tariff

FSA - Forward Sortation Area

GHG - Greenhouse Gas

GJ / TJ / PJ - Gigajoule / Terajoule / Petajoule

GPC - Global Protocol for Community-Scale Greenhouse Gas Emission Inventories

IESO - Independent Electricity System Operator

IRRP - Integrated Regional Resource Plan

kW / MW - Kilowatts / Megawatts

kWh / MWh / TWh - Kilowatt-hours / Megawatt-hours / Terawatt-hours

LAM - Local Area Municipality

LDC - Local Distribution Company

MEP - Municipal Energy Plan

NIR - National Inventory Report

NPCA - Niagara Peninsula Conservation Authority

NPEI - Niagara Peninsula Energy Inc.

NRCan - Natural Resources Canada

NSTS - Niagara Student Transportation Services

NTC - Niagara Transit Commission

OEB - Ontario Energy Board

PV - Photovoltaic

QGIS - Geographic Information System software

RRR - Reporting and Record Keeping Requirements

SC - Steering Committee

tCO_2e / $ktCO_2e$ / $MtCO_2e$ - Tonnes / kilotonnes / megatonnes of carbon dioxide equivalent

TMP - Transportation Master Plan

WG - Working Group

Units of Measurement

Energy and GHG emissions are presented using different units throughout this study depending on the scale of the data. The following conversions can be used to compare results presented in different units.

Measure	Unit Relationships
Energy	1 PJ = 1,000 TJ = 1,000,000 GJ
Electricity	1 TWh = 1,000 GWh = 1,000,000 MWh = 1,000,000,000 kWh
GHG Emissions	1 $MtCO_2e$ = 1,000 $ktCO_2e$ = 1,000,000 tCO_2e
Power/Capacity	1 MW = 1,000 kW

Note: Energy units measure the amount of energy consumed or produced, while power units (kW, MW) describe the rate at which electricity is generated, delivered or consumed.

Executive Summary

Niagara Region is developing a Community Energy Plan (CEP) to guide how energy is produced, distributed, and used across the region over the coming decades. The CEP will consider energy affordability, reliability, infrastructure, economic development, greenhouse gas (GHG) emissions, community resilience, and the changing energy needs of a growing region.

This Baseline Energy and GHG Emissions Study establishes the starting point for that work. Using 2024 as the baseline year, it brings together electricity, natural gas, transportation fuels, propane, and heating oil data to provide a region-wide understanding of current energy use and associated emissions. The study examines how energy use varies by fuel source, category, Local Area Municipality (LAM), and geography, and provides additional context related to buildings, transportation, distributed energy resources, energy spending, affordability, growth, and future electricity demand.

The baseline is not intended to determine the actions that Niagara should pursue. Rather, it provides a common evidence base that will be combined with technical analysis, existing plans and infrastructure studies, and engagement with interested parties as the CEP is developed.

Key Baseline Findings

In 2024, Niagara consumed approximately **69.1 petajoules (PJ) of energy,** equivalent to 127 gigajoules (GJ) per capita. This energy consumption resulted in approximately **3.35 megatonnes of carbon dioxide equivalent ($MtCO_2e$) of GHG emissions**, or **6.2 tCO_2e per capita**.

Niagara's per capita energy use is comparable to the City of London. However, its per capita GHG emissions are lower than all benchmark Ontario communities reviewed. Differences between energy use and emissions can reflect the mix of energy sources consumed, as electricity has a substantially lower GHG emissions intensity than fossil fuels in Ontario. Benchmark comparisons should be interpreted as directional, however, as differences in community characteristics, inventory scope, data availability and methodology can also affect reported results.

Key findings of the study include:

Niagara's energy system remains heavily dependent on fossil fuels

- Natural gas: **41% of energy use**
- Gasoline: **29%**
- Electricity: **26%**
- Fossil fuels: **~90% of GHG emissions**

The largest opportunities are spread across sectors

- Transportation: **43% of GHG emissions**
- Businesses: **42% of energy use**
- Existing buildings/homes remain a major retrofit opportunity
- Space heating is heavily natural gas-dependent

Energy needs differ across Niagara

- Highest total use in larger urban centres
- Per capita energy use varies widely
- Tourism, agriculture, housing, and industry all matter
- No single solution fits every community

Niagara already has a base of local energy resources

- Net-metered generation: **5.6 MW**
- Embedded generation: **106 MW**
- Renewables: **~75%** of embedded capacity
- Distributed energy resources and storage can support future demand

Energy can be an economic opportunity

- **~$2B/year** spent on energy
- **~$67B** through 2050
- Large share leaves the local economy
- Efficiency can reduce energy costs
- Local energy investment can retain more value
- Affordability affects who can participate

Transportation and electricity demand are changing

- Niagara remains highly vehicle-dependent
- EV adoption is growing, but unevenly
- **817,000 residents + 267,000 jobs by 2051 will add to overall energy demand**
- Electrification will further increase electricity demand

Taken together, these findings point to several themes that will carry forward into CEP development: reducing fossil fuel use, improving existing buildings, supporting cleaner transportation, planning for increasing electricity demand, expanding distributed energy opportunities, coordinating energy and land use planning, and considering affordability and participation throughout the transition.

From Baseline to Community Energy Plan

The Baseline Study is the first stage of a broader CEP development process. Its findings will be considered alongside ongoing electricity, transportation, land use, infrastructure, and other regional and local planning initiatives.

Engagement will be integrated directly into this work. A CEP Engagement Plan has been developed, and formation of the Steering Committee and five thematic Working Groups is occurring in parallel with completion of the Baseline Study. These groups will help interpret the baseline, establish priorities, assess future scenarios and potential actions, and support implementation planning.

Technical analysis, engagement, and coordination with related plans and infrastructure studies will continue throughout CEP development. The objective is to move from an evidence-based understanding of Niagara's current energy system toward a practical, locally informed, and implementation-focused CEP.

The process is also intended to establish a collective impact network of organizations and community partners that can remain engaged through implementation and support long-term coordination, accountability, and progress toward Niagara's shared energy objectives.

1. Introduction and Study Context

1.1 Document Purpose

This Baseline Energy and Greenhouse Gas (GHG) Emissions Study establishes a comprehensive understanding of energy consumption and associated emissions across the Niagara region. It quantifies how energy is used across key sectors and identifies the primary sources of greenhouse gas emissions within the region.

The study is a foundational component of the Niagara Region Community Energy Plan (CEP). It provides the data and analysis required to support subsequent phases of the CEP, including visioning, scenario modelling and action development. The baseline enables consistent tracking of progress over time and supports evidence-based decision making.

This work aligns with the Province of Ontario's Municipal Energy Plan (MEP) Program, which requires municipalities to develop a baseline understanding of community-wide energy use and emissions as a first step in long-term energy planning. The baseline study supports this requirement by compiling available data, applying established methodologies, and identifying key trends to inform the development of the CEP.

This project was undertaken with support from the Province of Ontario through the Ministry of Energy and Mines. The views expressed in this publication do not necessarily represent the views of the Province of Ontario.

1.2 Baseline Year and Inclusion Protocol

Establishing a baseline year is a critical step in community energy planning. It provides a consistent reference point against which future energy consumption and GHG emissions can be compared. A well-defined baseline enables the Region to track progress over time, assess the impact of implemented actions, and support transparent reporting.

The baseline year for the Niagara Region CEP is **2024**. This year was selected because it represents the most recent calendar year at project initiation with sufficiently complete and reliable datasets across key sectors, including electricity, natural gas, and transportation fuels. Selecting a recent year with robust data availability is consistent with standard practice in community energy and emissions inventories. This includes guidance from the GHG Protocol for Cities, which recommends using a representative year to improve accuracy and relevance of the inventory.

Inclusion Protocol

Energy consumption and subsequent GHG emissions are included in the CEP baseline where they are associated with activity occurring within Niagara, including activity by local residents, businesses, institutions, services, and visitors. This includes electricity and natural gas consumed through accounts within the region and transportation fuels

sold within the region. Sources are generally included where the Region or its Local Area Municipalities (LAMs) can reasonably influence outcomes through policy, planning, infrastructure, or programs.

Sources occurring within the geographic boundary but largely driven by external activity or operators beyond municipal influence are excluded. This excludes activity that cannot be reliably attributed to local demand and activity where credible local data is unavailable. These types of sources may be acknowledged qualitatively but are not quantified in this baseline report. As an example, long-distance freight transportation through Niagara was excluded from this baseline.

1.3 Niagara's Energy Supply

This section provides an overview of how energy is supplied and distributed across the Niagara region. It covers electricity, natural gas, transportation fuels, heating oil, and propane. It also explains the role and types of renewable and other distributed energy resources (DERs) operating within the region.

1.3.1 Regional Context

Energy supply in the Niagara region is more complex than in a single- or lower-tier municipality. The region includes multiple LAMs with differing utility providers, infrastructure, and energy user characteristics. As a result:

- Multiple electricity Local Distribution Companies (LDCs) operate within the region
- Energy supply infrastructure varies by geography and service territory
- Data availability and granularity can differ by provider
- Regional coordination is required to understand system-wide energy use

This structure benefits from a coordinated, region-wide approach to energy planning and analysis.

1.3.2 Electricity

1.3.2.1 Overview

Electricity in the Niagara region is generated through a mix of provincial and local sources and delivered through Ontario's integrated grid. Generation is coordinated by the Independent Electricity System Operator (IESO), while transmission is primarily operated by Hydro One.

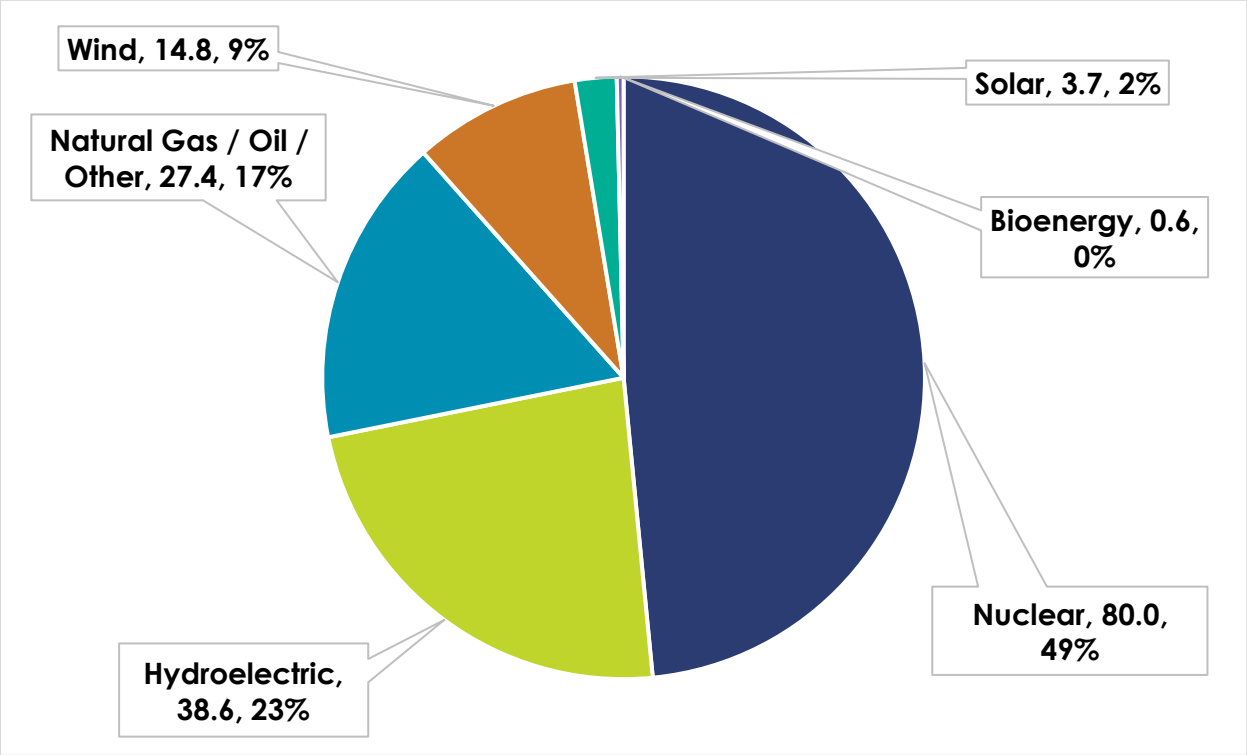
Electricity is then distributed to end users through LDCs, which are responsible for delivering power from transmission systems to homes and businesses.

1.3.2.2 Ontario Electricity Supply Mix

Niagara's connection to Ontario's integrated electricity system means that most electricity consumed in the region reflects the broader provincial generation mix rather than only generation located within Niagara.

Ontario has a relatively low-carbon electricity supply. In 2024, over 80% of electricity generated in Ontario came from nuclear, hydroelectric, wind, solar and bioenergy resources, while approximately 17% came from natural gas, oil and other sources. Nuclear was the largest source of generation, followed by hydroelectric.

Figure 1 - Ontario Electricity Generation (TWh) by Source, 2024[1]



Most of Ontario's major generation sources have low or no operational GHG emissions. This supply mix is important to the CEP because it explains the relatively low GHG emissions associated with electricity use compared with fossil fuels. It also means that electrifying transportation, building heating and other fossil-fuel end uses can meaningfully reduce community-wide GHG emissions.

1.3.2.3 Local Distribution Companies (LDCs)

The Niagara region is served by multiple LDCs, reflecting its multi-municipal structure. The LDCs operating within the region include:

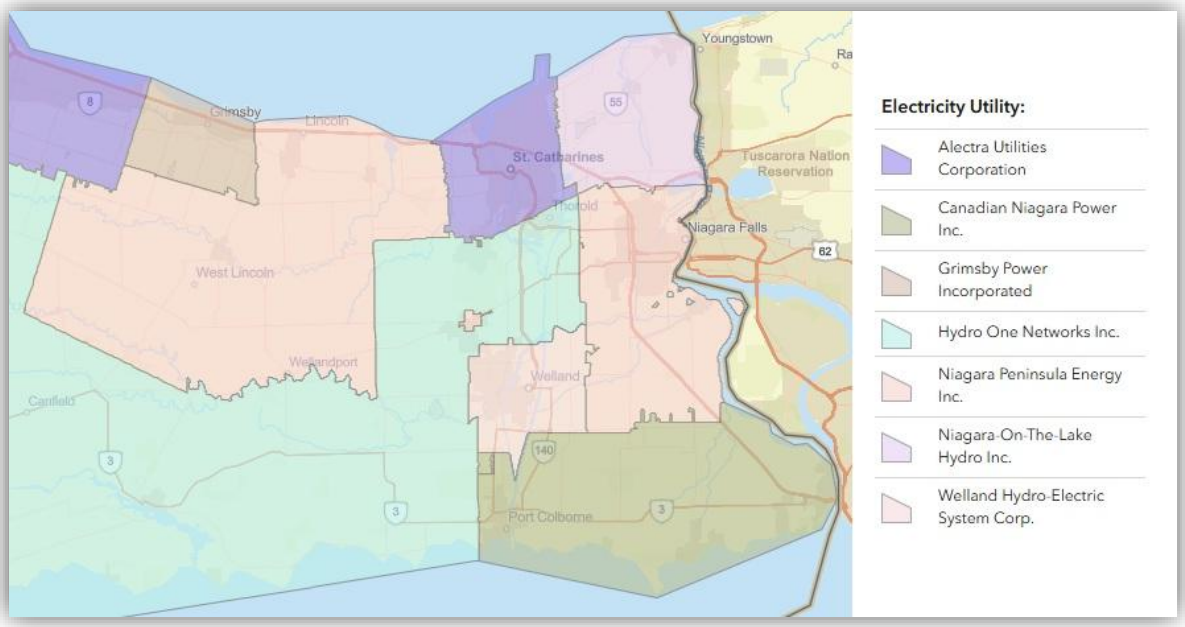
[1] IESO Clean Energy Credits 2024 Program Year End Report

Table 1 - Local Distribution Companies in Niagara

LDC	Primary Service Areas within Niagara
Alectra Utilities	St. Catharines and surrounding areas
Canadian Niagara Power	Fort Erie, Port Colborne
Grimsby Power	Grimsby
Hydro One	Thorold, Wainfleet, rural and low-density areas across multiple LAMs
Niagara-on-the-Lake Hydro	Niagara-on-the-Lake
Niagara Peninsula Energy Inc. (NPEI)	Niagara Falls, Lincoln, West Lincoln, Pelham
Welland Hydro	Welland

Note that service territories may overlap in some areas and are defined by Ontario Energy Board (OEB) service boundary mapping. A spatial map of LDC service boundaries within Niagara per the OEB's Service Area Map[2] is provided below:

Figure 2 - OEB LDC Service Area Map



[2] OEB Public Electricity and Natural Gas Application

This multi-LDC structure is a key distinction between regional and local energy plans. It introduces complexity in data collection, coordination, and planning. Each LDC operates independently with its own systems, customers, and reporting structures, while also meeting common reporting and regulatory requirements established by the OEB.

1.3.2.4 Electricity Generation and Renewable Energy

Niagara has a strong legacy of electricity generation, driven primarily by its location along the Niagara River. Niagara Falls is home to the Sir Adam Beck I and II Generating Stations, which together represent the largest hydroelectric stations in Ontario with a total capacity of approximately 1,962 MW (megawatts). In addition to hydroelectric generation, the Niagara Region Wind Farm contributes roughly 230 MW of installed capacity. These large-scale facilities are connected to the provincial transmission system and form part of Ontario's broader electricity supply mix.

Beyond these centralized assets, electricity in Niagara is also supplied through a range of DERs, which are smaller-scale generation or energy storage resources located close to where energy is used.

Generation resources vary in size, ownership, and how they interact with the grid, but are generally structured under three main models.

Grid-Supplied Generation

Large generation facilities, including utility-scale hydro, wind, solar, and natural gas plants, supply electricity directly to the provincial grid. These systems are either participants in the Independent Electricity System Operator (IESO) wholesale market or operate under legacy Feed-in Tariff (FIT) and microFIT contracts. Market participants are dispatched based on system demand and operating conditions, while FIT and microFIT projects operate under long-term pricing agreements for renewable generation. Together, these systems represent the primary sources of grid-supplied electricity in Ontario.

Net-Metered Generation

Smaller-scale generation has grown through net metering, where residential, commercial, and institutional users install on-site systems, most commonly rooftop solar, to offset their electricity consumption. Any excess generation is exported to the grid in exchange for billing credits. These systems are typically distributed and smaller in size, making them more difficult to track at a regional level but increasingly important as adoption grows.

Embedded Load Displacement Generation

Some facilities operate on-site, behind-the-meter generation systems to offset a portion of their electricity demand without exporting power to the grid. These systems are commonly used in industrial, commercial, and institutional settings and may include combined heat and power (CHP), solar, or other technologies. Because they reduce grid demand rather than supply electricity to it, they are not always captured in standard generation reporting but can represent a meaningful component of local energy use.

These different generation models influence how electricity is produced, delivered, and accounted for across the region. Large-scale facilities contribute to the provincial supply, while distributed systems primarily reduce local demand on the grid. Together, they form a diverse and evolving electricity system that will play a key role in future energy planning and decarbonization efforts.

In addition to generation, energy storage systems are beginning to emerge as part of the electricity system. These systems can store electricity and discharge it during periods of peak demand, supporting grid reliability and enabling greater integration of renewable energy. Deployment of energy storage systems is limited across the Niagara region at this time.

1.3.3 Natural Gas

Natural gas distribution in the Niagara region is provided by Enbridge Gas.

- Enbridge operates the distribution network that delivers gas to residential, commercial, and industrial customers
- The system includes high-pressure transmission pipelines and lower-pressure distribution networks
- Customers may also contract with third-party energy retailers, although Enbridge remains the physical distributor

Natural gas remains a major energy source for space heating, domestic hot water and industrial process heating across the region.

In addition to conventional pipeline-delivered natural gas, compressed natural gas (CNG) is becoming more prominent in specific applications. CNG is typically used as a transportation fuel or in fleet operations where centralized fueling is feasible. Within Niagara, this could include municipal and transit fleets, waste collection vehicles, and some commercial trucking operations. CNG is also used at facilities with high and consistent fuel demand, where on-site fueling infrastructure can be justified. While still a relatively small share of total energy use, CNG represents a growing opportunity for lower-emission fuel switching within the transportation sector.

1.3.4 Transportation Fuels

Transportation energy in the Niagara region is supplied through a combination of retail fuel markets and direct fuel supply systems. Gasoline and diesel are the dominant fuels, supporting light-duty vehicles, heavy-duty trucks, transit fleets, and off-road equipment.

Retail fuel sales are widely distributed across the region, with approximately 125 gasoline and diesel stations serving residents, businesses, and through-traffic. These stations are not evenly used by local residents, as Niagara's location along major transportation corridors and its role as a tourism destination result in a significant portion of fuel sales being associated with non-resident travel. This introduces challenges when interpreting fuel consumption at a local level.

In addition to retail fueling, many commercial, industrial, and institutional operations rely on direct fuel supply through on-site storage tanks. This is common for municipal fleets, transit systems, waste collection vehicles, agricultural operations, and large logistics or industrial facilities. These systems allow for bulk fuel purchasing and centralized fleet management and are often not captured in retail fuel datasets.

Unlike electricity and natural gas, transportation fuel supply chains are regional, national, and international in scale, with limited direct control at the municipal or regional level. As a result, municipalities have limited influence over fuel production and distribution. However, they can influence demand through land use planning, transportation infrastructure, and policies that support mode shift, electrification, and efficiency.

Transportation fuels represent a significant share of total energy consumption and GHG emissions in the Niagara region. However, accurately attributing fuel use to specific LAMs can be challenging due to cross-boundary travel patterns, including commuting, goods movement, and tourism-related traffic.

1.3.5 Heating Oil and Propane

Heating oil and propane represent smaller and declining components of the Niagara region's overall energy supply. Both fuels are primarily used in areas without access to natural gas infrastructure, typically in rural or low-density parts of the region.

These fuels are supplied by private distributors and delivered directly to end users, either through bulk delivery to on-site storage tanks or, in the case of propane, through retail refill locations. There is no centralized distribution network for either fuel.

Heating oil is mainly used for space heating in older residential and commercial buildings and has declined steadily over time as properties transition to natural gas or electric systems.

Propane has a broader range of applications. In addition to space heating, it is commonly used in agricultural operations, for backup or supplemental heating, and for cooking applications such as barbecues. While propane remains more flexible than heating oil, its overall role in the region's energy mix is also declining as cleaner and more efficient alternatives become available.

Both fuels continue to play a role where other energy infrastructure is not available, but their contribution to total energy consumption and emissions is relatively limited compared to electricity, natural gas, and transportation fuels.

1.4 Data Collection Process, Assumptions and Limitations

The baseline was developed using data obtained from a range of organizations, including electricity LDCs, Enbridge Gas, transportation fuel data providers, Statistics Canada, Niagara Region, and LAMs. These datasets were compiled, standardized, and analyzed using established community energy planning practices to develop a comprehensive inventory of energy consumption and associated GHG emissions across the region. A summary of the data sources, methodologies, assumptions, and spatial allocation methods used is provided in Appendix A. Energy conversion factors, GHG emission factors and energy rates applied throughout the analysis are summarized in Appendix B.

The methodology was developed with reference to recognized community energy planning best practices, including relevant principles established by the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) and other accepted Canadian community energy planning approaches. The baseline study is focused on energy consumption and associated GHG emissions and is not intended to constitute a

complete GPC-compliant community-wide GHG inventory. Accordingly, non-energy emissions sources such as solid waste and wastewater are outside the current scope.

Where multiple data sources were available, preference was given to the most recent, complete, and locally representative datasets. As with any community-wide energy inventory, the quality and certainty of available data vary between data sources and categories. Data provided by third parties is subject to the accuracy, completeness, aggregation, confidentiality constraints, and other limitations of the source datasets and is relied upon as provided, without independent verification or warranty as to its accuracy or completeness. This report provides transparency regarding the assumptions, estimation methods, and allocation approaches used where complete or directly attributable data was unavailable.

Some geographic metrics presented in this report, including LAM energy use, emissions, and per capita values, are subject to a degree of uncertainty resulting from data availability and privacy limitations. For example, some utility data was only available at the Forward Sortation Area (FSA) level. This data was allocated to LAMs based on the primary municipality within the FSA, or proportionally split where a reasonable allocation could be determined. In other cases, such as portions of industrial energy consumption, data could not be geographically disaggregated due to privacy requirements and is therefore reported only at the Niagara region level rather than assigned to individual LAMs. Transportation fuel consumption was compiled using retail transportation fuel sales supplemented by available fuel consumption data for specific public and institutional fleets. Privately supplied agricultural and other off-road fuels are not comprehensively captured in the available datasets. A high-level screening estimate suggests this represents a relatively small share of total community energy use and GHG emissions. However, this estimate was not added to the baseline because the portion already captured through retail fuel sales could not be reliably determined, creating a risk of double counting.

While these limitations introduce some uncertainty into localized results, the methodologies used are considered appropriate for regional-scale community energy planning and provide a robust baseline for future monitoring and comparison. The results are not intended to be relied upon for site-specific operational or investment decisions without further detailed review and validation.

2. Energy and Emissions Results

This section of the study summarizes Niagara region's 2024 baseline energy consumption and associated GHG emissions.

As shown in Table 2, approximately **69.1 PJ** (petajoules) of energy was consumed in the region in 2024, generating approximately **3.35 $MtCO_2e$** (million tonnes of carbon

dioxide equivalent) of GHG emissions. These values provide the overall reference point for understanding Niagara's current community energy and emissions profile.

Table 2 - Energy and Emissions Summary

Metric	Value
Total Energy Consumption	69.1 PJ
Energy Consumption per Capita	127 GJ per capita
Total GHG Emissions	3.35 $MtCO_2e$
GHG Emissions per Capita	6.2 tCO_2e per capita

The underlying CEP datasets allow these totals to be examined from several perspectives, including by fuel source, end-use category, LAM, and geographic distribution. They also support analysis of DERs, energy expenditures, and comparisons with other communities. The following subsections focus on the perspectives that provide the most useful insight into how energy is used across Niagara, where emissions are generated, and where future CEP actions may have the greatest relevance.

2.1 By Fuel Source

Figure 3 and Figure 4 show the region's energy consumption and GHG emissions[3], respectively, by fuel source.

[3] In kilotonnes of carbon dioxide equivalent, or "ktCO2e".

Figure 3 - Energy Consumption (PJ) by Fuel Source

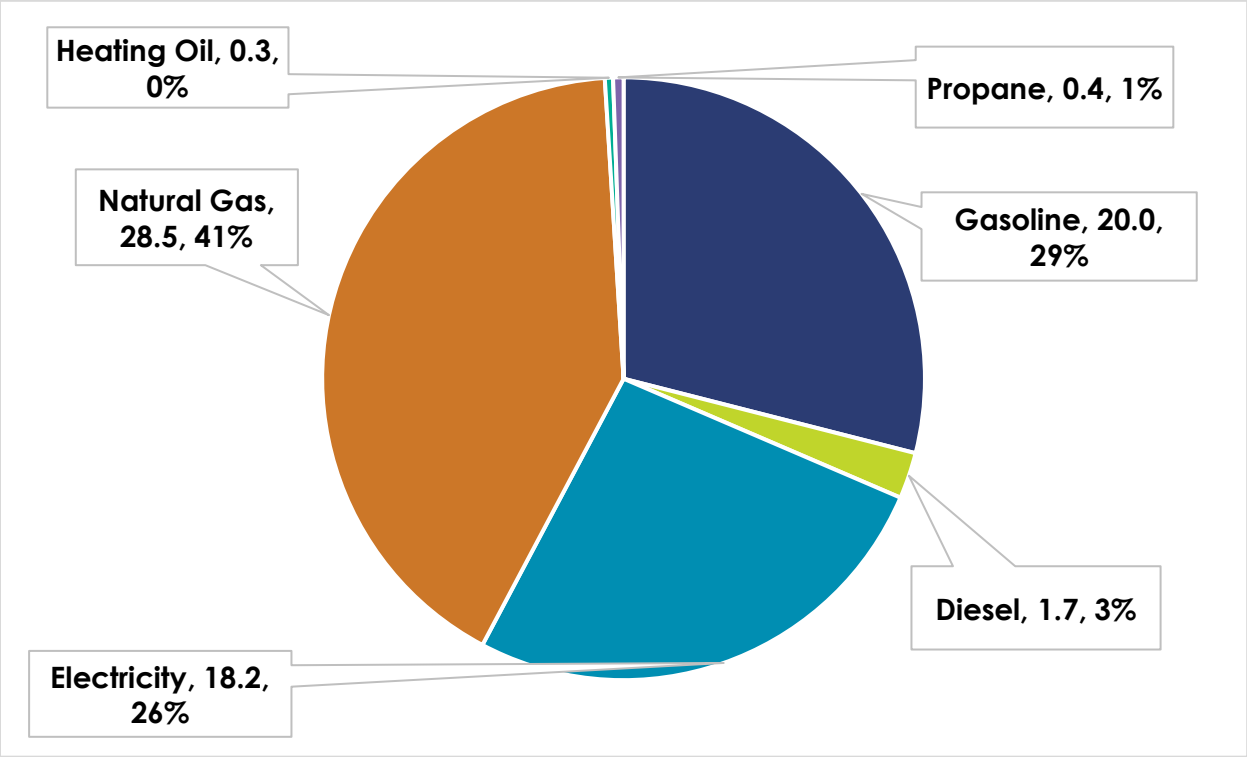
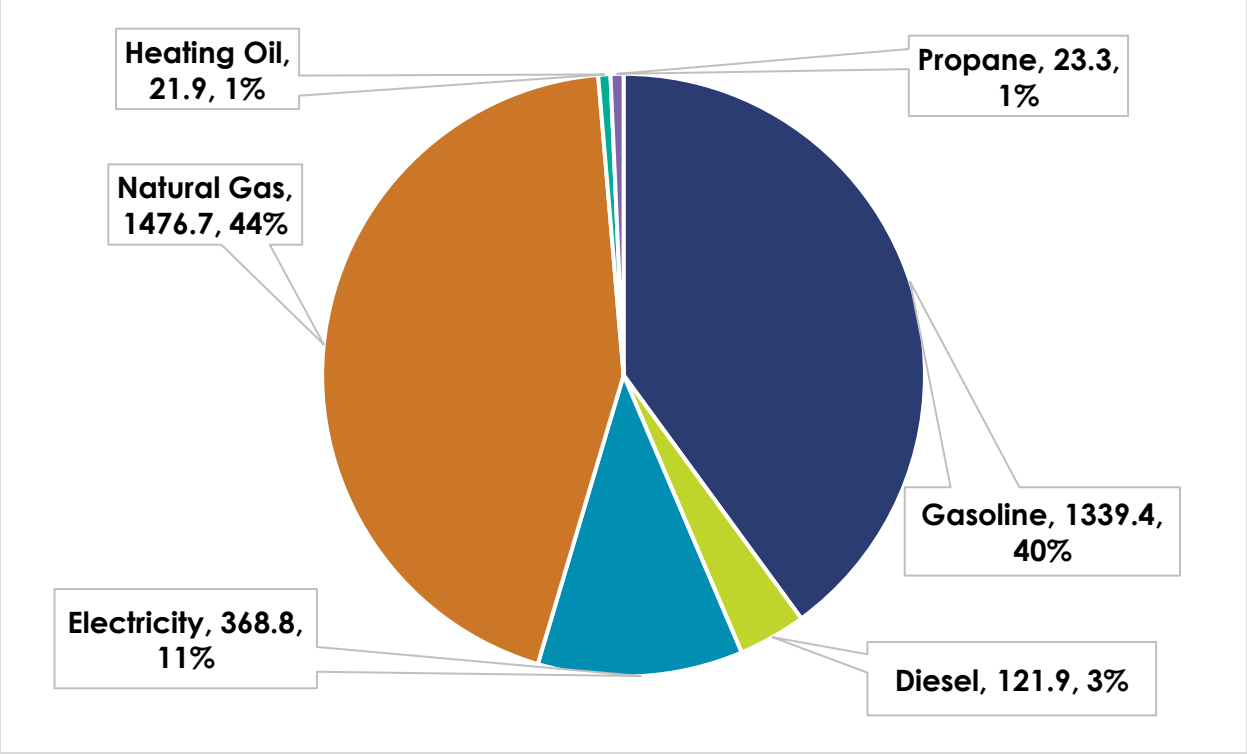


Figure 4 - GHG Emissions ($ktCO_2e$) by Fuel Source



Natural gas is the largest source of energy consumption in Niagara, accounting for 41% of the total, followed by gasoline at 29% and electricity at 26%. Together, these three sources account for approximately 96% of total energy use.

The emissions profile differs because each fuel has a different emissions intensity. Natural gas and gasoline account for 44% and 40% of GHG emissions, respectively, while electricity accounts for only 11% despite representing 26% of energy consumption. This reflects Ontario's relatively low-carbon electricity supply and highlights the importance of reducing fossil fuel use in future emissions reduction efforts.

2.2 By Category

Figure 5 and Figure 6 below show the region's energy consumption and GHG emissions, respectively, by category. Pattern fills are used to distinguish fossil fuel-based energy use, including transportation fuels, from electricity consumption.

For the purposes of these figures, the categories reflect the classifications available in the source datasets:

- **Homes – Electricity:** Residential electricity utility accounts.
- **Businesses – Electricity:** Non-residential electricity utility accounts, primarily General Service <50 kW and >50 kW customers, including commercial and industrial uses.
- **Other – Electricity:** Sentinel and rental lighting, unmetered loads, streetlighting, and communications utilities, as classified by the electricity LDCs.
- **Homes – Fossil Fuel:** Primarily residential natural gas consumption, with smaller contributions from propane and heating oil.
- **Businesses – Fossil Fuel:** Natural gas consumption from commercial and industrial customers.
- **Transportation – Passenger:** All retail gasoline and diesel sales are classified as passenger transportation, reflecting that passenger vehicles are the primary users of retail fuel.
- **Transportation – Commercial/Group:** Fuel consumption reported for the specific fleets for which data were available, including Niagara Transit Commission, Metrolinx GO Train, Niagara Region and LAM corporate fleets, Niagara Student Transportation Services, Niagara Region Waste Management, Niagara Parks Commission, Niagara Peninsula Conservation Authority, and Brock University. This category is therefore not a comprehensive inventory of all commercial or off-road transportation fuel use in Niagara. Privately supplied

agricultural and other off-road fuels are not comprehensively captured, as discussed in Section 1.4.

Figure 5 - Energy Consumption (PJ) by Category

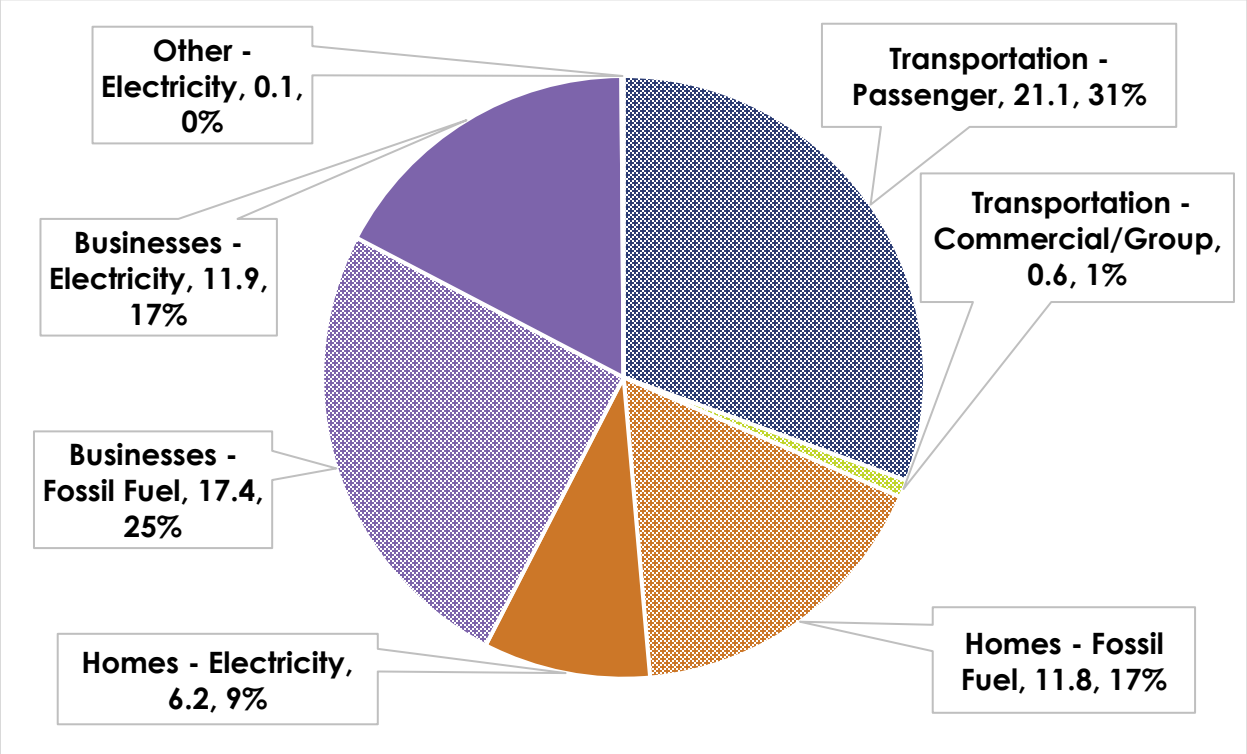
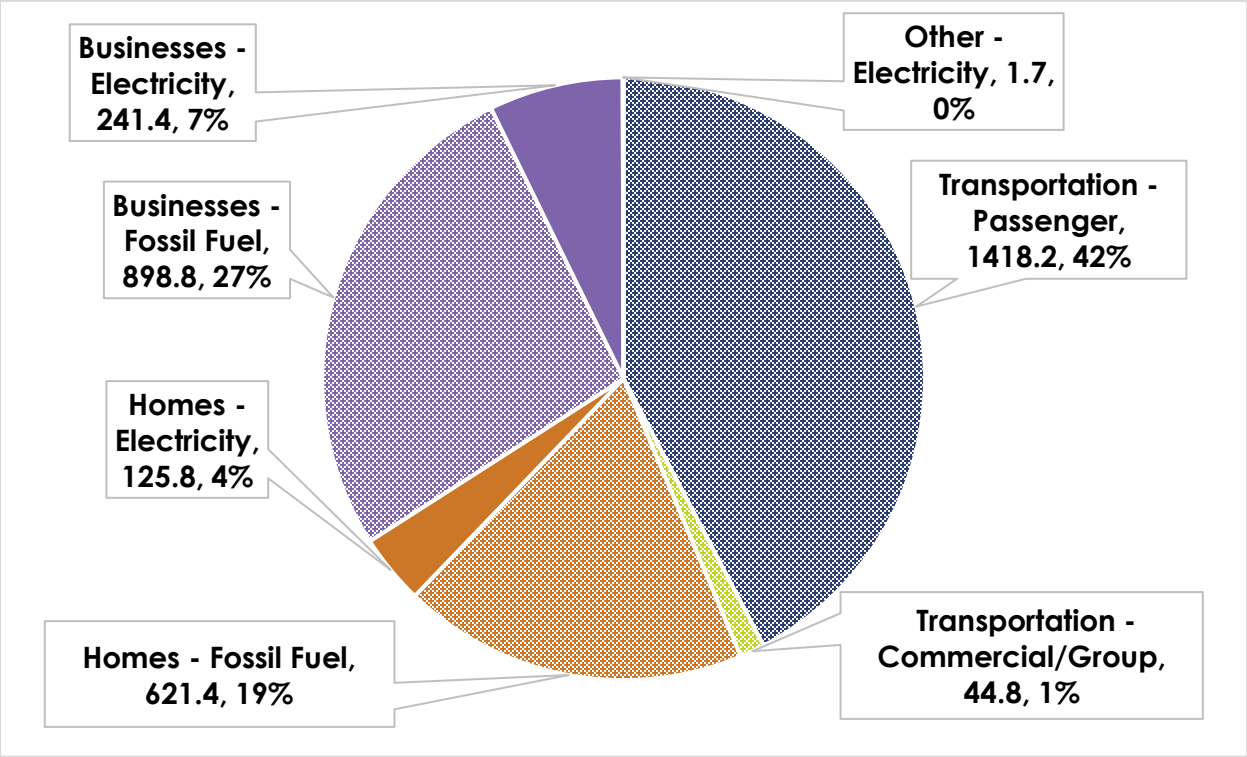


Figure 6 - GHG Emissions ($ktCO_2e$) by Category



Businesses represent the largest share of energy consumption in Niagara, accounting for approximately 42% of the total (combined electricity and fossil fuel use). Transportation accounts for approximately 32%, while homes account for approximately 26%.

The emissions profile, again, highlights the dominant role of fossil fuel consumption. Transportation, which is driven by gasoline and diesel consumption, accounts for approximately 43% of Niagara's GHG emissions. Fossil fuel use by businesses contributes another 27%, while fossil fuel use in homes contributes 19%. Combined, these sources account for nearly 90% of Niagara's GHG emissions. This indicates that reducing fossil fuel consumption across transportation, homes, and business operations will be central to achieving significant emissions reductions in Niagara.

Electric vehicle (EV) charging electricity is embedded within the electricity consumption reported for homes and businesses because utility data do not separately identify this end use. A high-level screening estimate, based on the number of registered EVs in Niagara, average annual vehicle kilometres travelled, and typical passenger EV efficiency, indicates that EV charging represents less than 1% of Niagara's total electricity consumption and less than 0.5% of total community energy consumption. Its treatment within the stationary electricity categories at the current adoption levels therefore have a negligible impact on the overall results.

2.3 By Local Area Municipality (LAM)

Figure 7 and Figure 8 compare total and per capita energy consumption and GHG emissions, respectively, across Niagara's 12 LAMs. These results provide a more localized view of Niagara's energy and emissions profile and help illustrate how energy use varies across communities with different populations, development patterns, transportation needs, and economic activity.

LAM-level results should be interpreted with some caution due to the data limitations described in Section 1.4. Some utility data was only available at the FSA level and required allocation between LAMs. More significantly, approximately 8.8 PJ of industrial natural gas consumption, and its associated GHG emissions, could not be assigned to a specific FSA or LAM due to data privacy limitations. This consumption is included in the Niagara-wide totals but excluded from the LAM-level results shown below. As a result, energy consumption and emissions may be understated for LAMs with significant industrial activity, and comparisons between individual LAMs should be considered directional rather than exact.

Note: The average per capita values shown in Figure 7 and Figure 8 represent the regional averages calculated using only energy consumption and GHG emissions that could be allocated to individual LAMs. As a result, these averages differ from and understate the overall Niagara baseline values. The actual values, including both allocated and unallocated energy use and emissions are 127 GJ and 6.2 tCO_2e per capita.

Figure 7 - Total and Per Capita Energy Consumption (GJ) by LAM

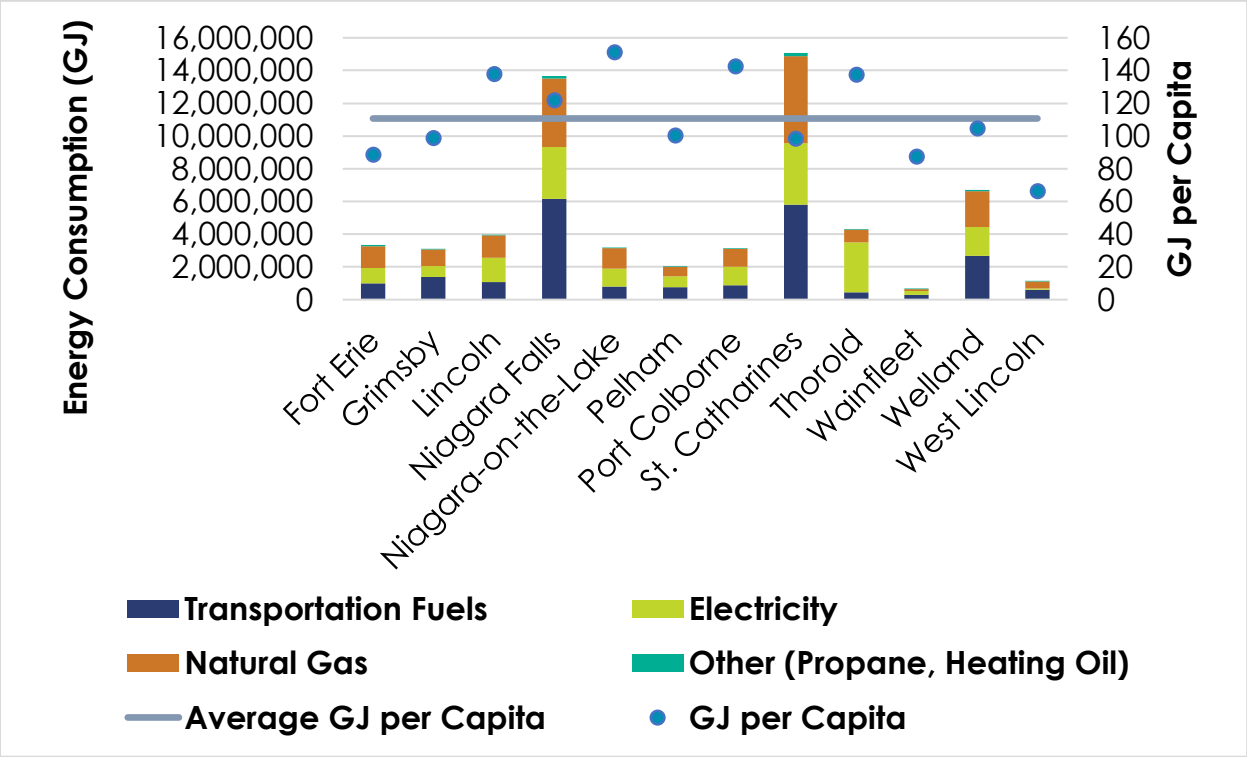
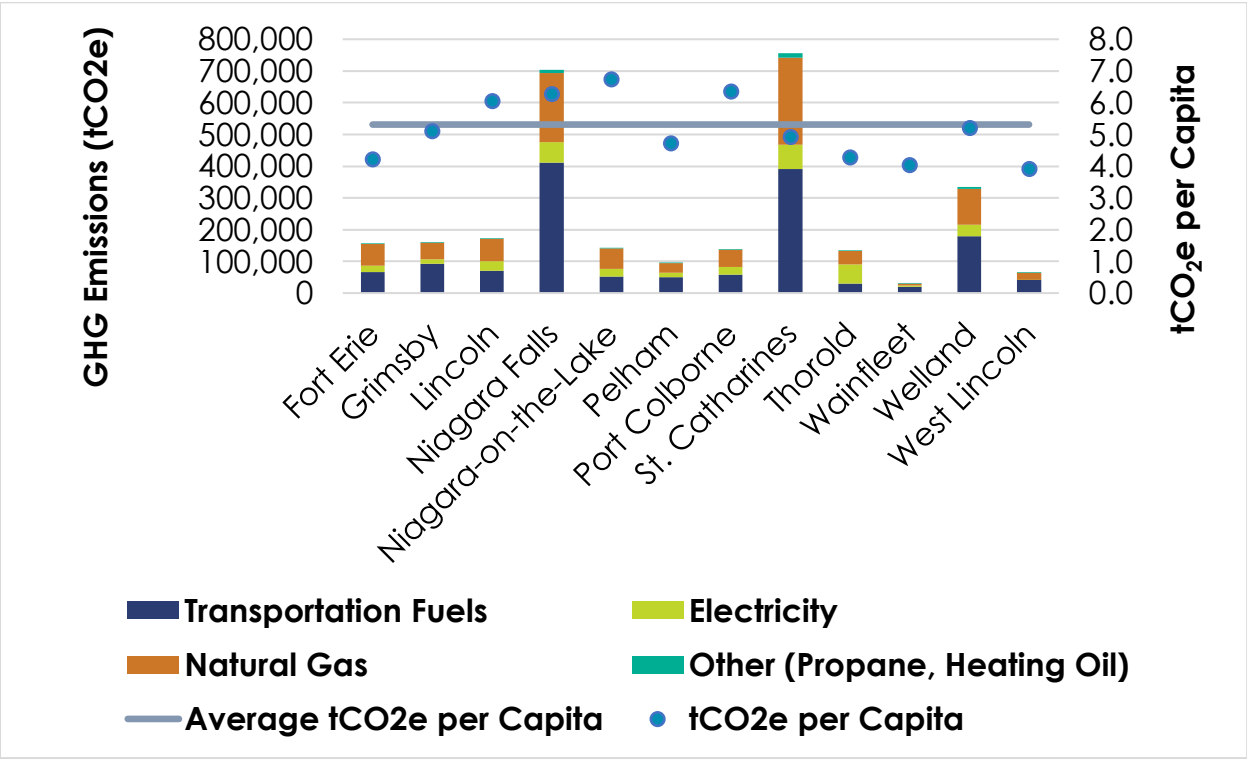


Figure 8 - Total and Per Capita GHG Emissions (tCO_2e) by LAM



Total energy consumption and emissions generally reflect population, with larger LAMs such as St. Catharines and Niagara Falls accounting for a greater share of the regional totals. Per capita results provide a different perspective, with notable variation between LAMs. These differences can reflect several factors, including the concentration and type of commercial and industrial activity, housing and development patterns, transportation needs, and the relative importance of different fuels within each community.

Higher per capita energy use or emissions should therefore not necessarily be interpreted as poorer energy performance. For example, Niagara-on-the-Lake has a relatively small resident population but a significant tourism, hospitality, retail, and agricultural economy, including hotels, restaurants, wineries, and greenhouse operations. Energy used by these businesses supports economic activity and visitors that are independent of the local population, which can contribute to higher per capita values. Similarly, lower-density and rural LAMs may have higher emissions due to greater transportation requirements and different building or agricultural energy needs. These results are therefore most useful for understanding differences in local energy profiles and identifying where different types of CEP actions may be most relevant.

2.4 Stationary Energy and Emissions Maps

Community energy mapping provides a spatial view of where energy is being consumed and where associated GHG emissions are generated. This can help identify concentrations of demand, differences between communities, and areas where future energy efficiency, infrastructure, or emissions reduction initiatives may be most relevant.

QGIS was used to map 2024 electricity and natural gas consumption and associated GHG emissions by FSA. The maps focus on stationary energy consumption and therefore do not include transportation fuels. As previously noted, a small amount of EV charging consumption remains embedded within electricity data but has a negligible impact on the results. Three sets of metrics are presented to provide different perspectives on energy use across Niagara.

As described in Section 1.4, the mapped results are subject to some uncertainty due to data availability, privacy requirements, and the need to allocate some utility data geographically. FSA boundaries do not align with municipal boundaries and, in some cases, a single FSA spans portions of multiple municipalities. For example, the L0S FSA includes portions of Niagara-on-the-Lake, Pelham, and Wainfleet, meaning the combined consumption associated with that FSA is represented across these areas on the maps. Mapped values will be useful to visualize consumption and emissions at the FSA level and not the municipal level.

2021 Census data was used for population and occupied private dwelling counts where required for the spatial analysis[4]. Population has increased across much of Niagara since 2021; however, more recent population data is not available at the FSA level. The mapped results should therefore be interpreted as indicative of broad spatial patterns rather than precise comparisons between areas.

Total Energy and Emissions

Figure 9 and Figure 10 show total energy consumption and associated GHG emissions, respectively, within each FSA. These maps identify where the largest absolute concentrations of stationary energy demand and emissions occur. Total values are influenced by several factors, including the number of homes and businesses within an FSA and the presence of larger commercial, institutional, agricultural or industrial energy users.

Residential Energy and Emissions per Dwelling

Figure 11 and Figure 12 show average residential energy consumption and emissions, respectively, for an occupied home. This removes much of the effect of population and community size and provides a better indication of differences in average residential energy use between areas. These differences can be influenced by housing type, size and age, heating systems, building efficiency, and local climate conditions.

Non-Residential Energy and Emissions Density

Figure 13 and Figure 14 show non-residential energy and emissions, respectively, relative to FSA land area. Energy density helps identify areas where commercial, institutional, agricultural and industrial energy demand is more concentrated, which can provide useful context for infrastructure planning, distributed energy opportunities, and targeted engagement with larger energy users.

Figure 9 through Figure 12 use equal-interval colour classifications, meaning each colour represents an equal range of values. Figure 13 and Figure 14 use an equal-count classification, which places a similar number of FSAs within each colour category. Given the observed distribution of the non-residential density data, the equal-count approach provides a clearer visualization of differences between FSAs.

[4] For the L0R FSA, 2021 Census population and occupied private dwelling counts were not directly used because L0R extends substantially beyond the Niagara region, including into Hamilton. To better represent the portion of L0R within Niagara, population and land area were approximated using the combined Lincoln and West Lincoln values. The number of occupied private dwellings was then estimated using the average dwelling-to-population ratio observed across the other Niagara FSAs included in the analysis.

Figure 9 - Map: Total Energy (GJ) by FSA

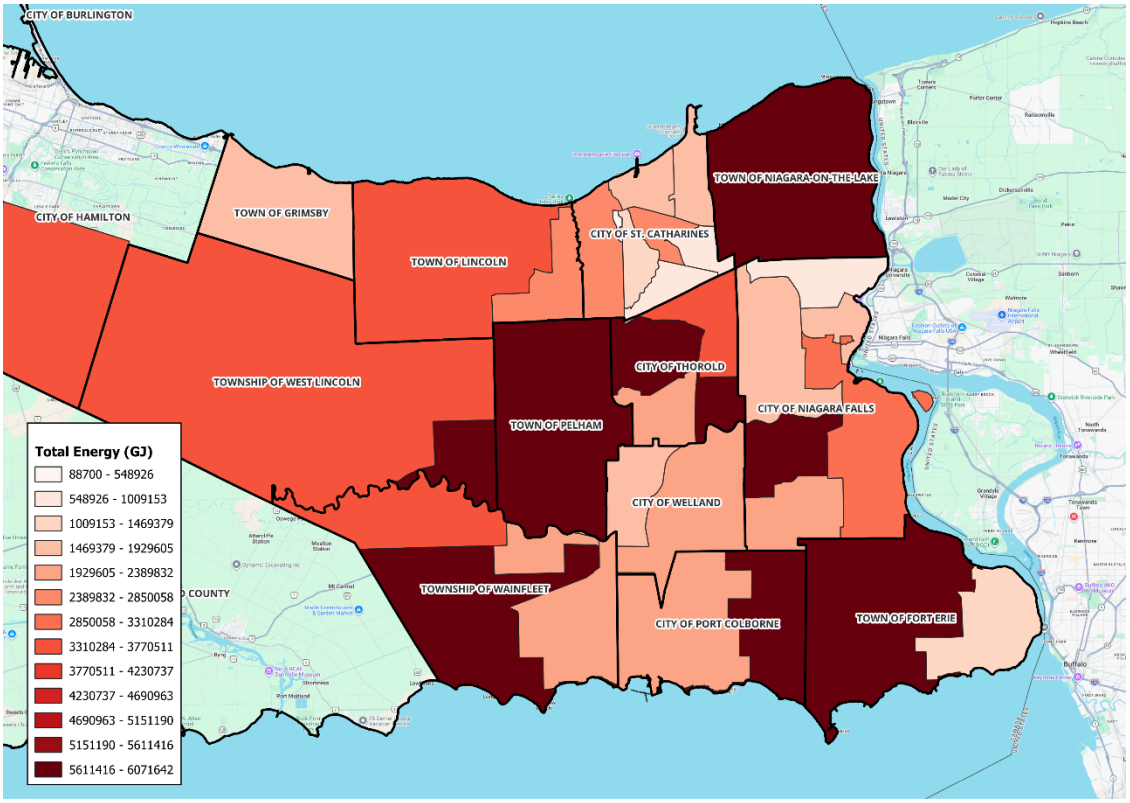


Figure 10 - Map: Total Emissions (tCO_2e) by FSA

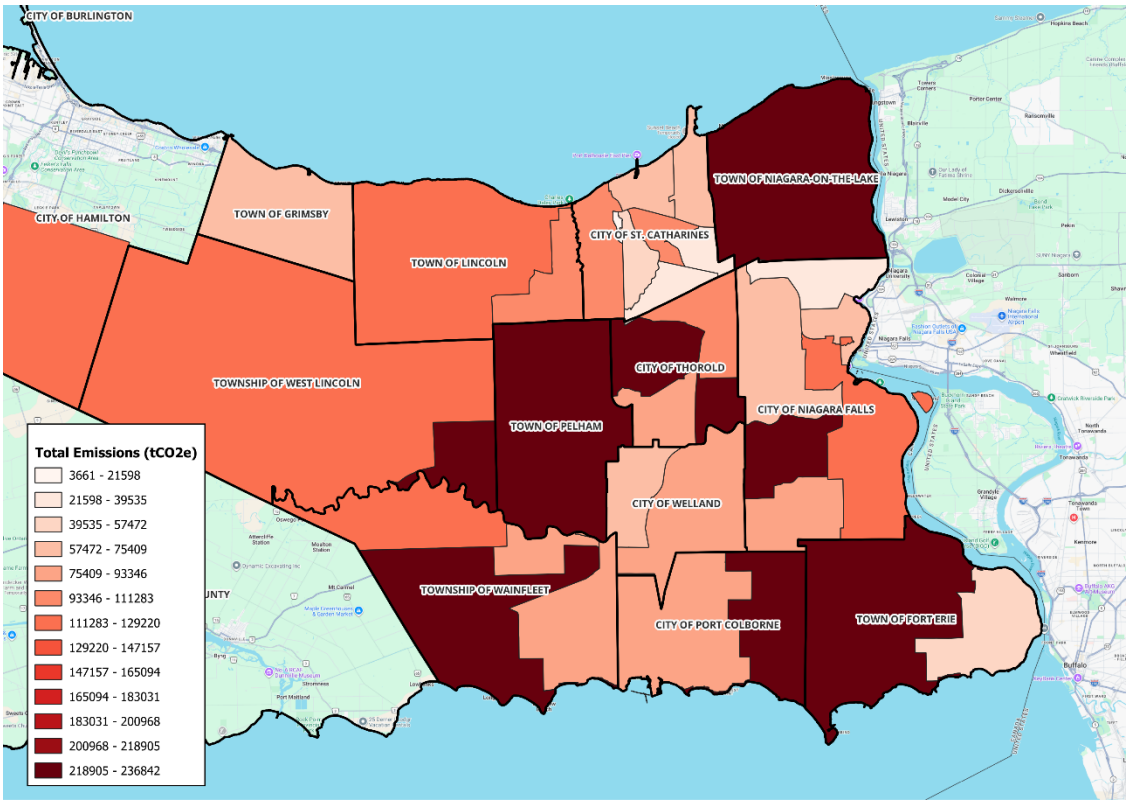


Figure 11 - Map: Residential Energy per Dwelling (GJ/Dwelling)

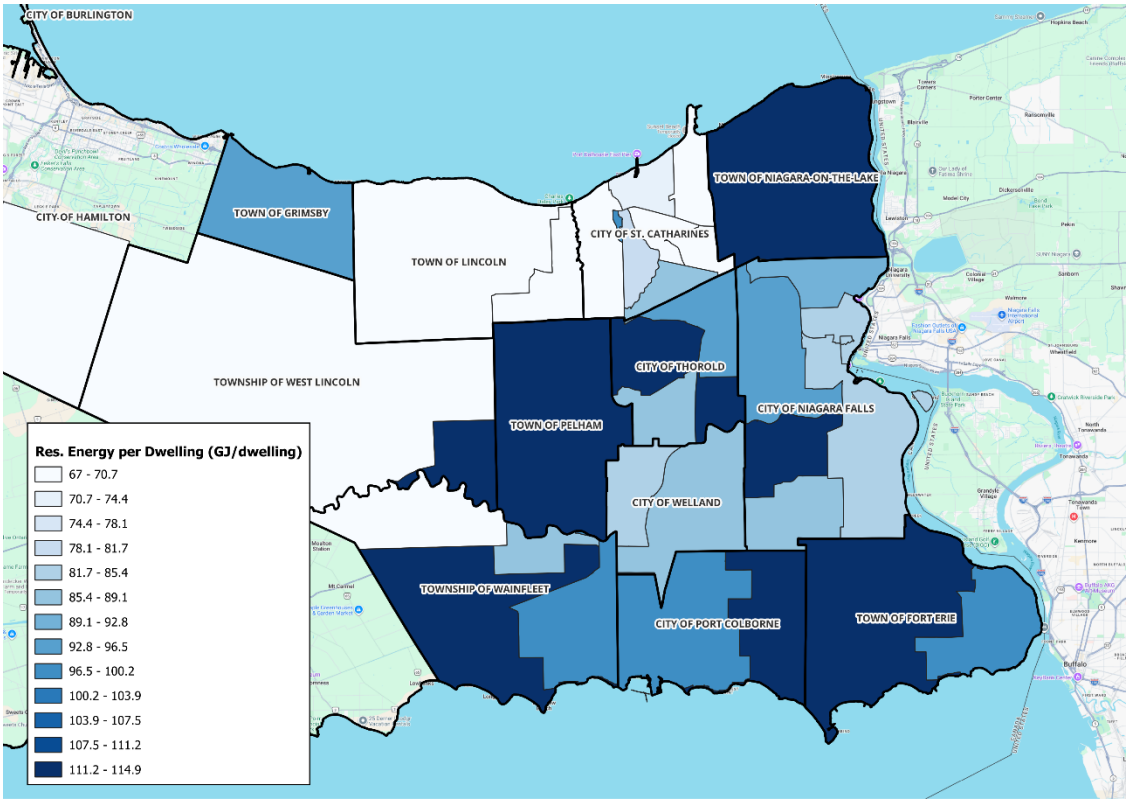


Figure 12 - Map: Residential Emissions per Dwelling (tCO_2e/Dwelling)

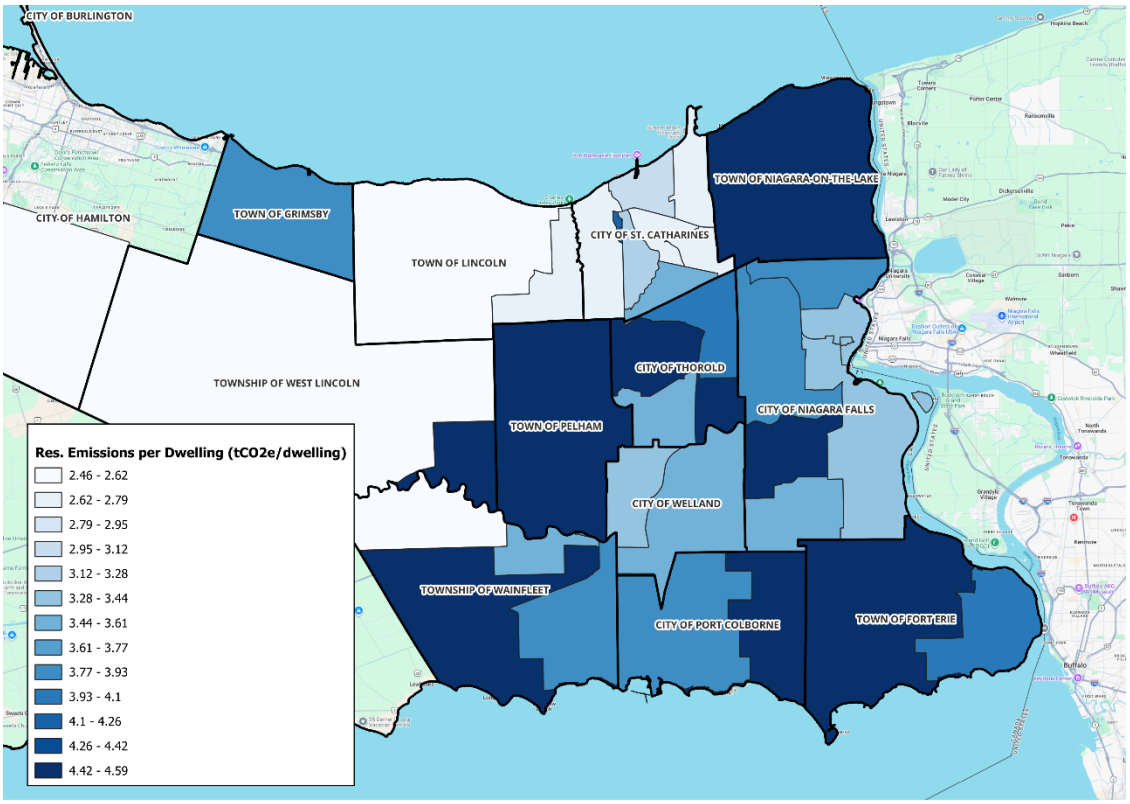


Figure 13 - Map: Non-Residential Energy Density (TJ/km^2)

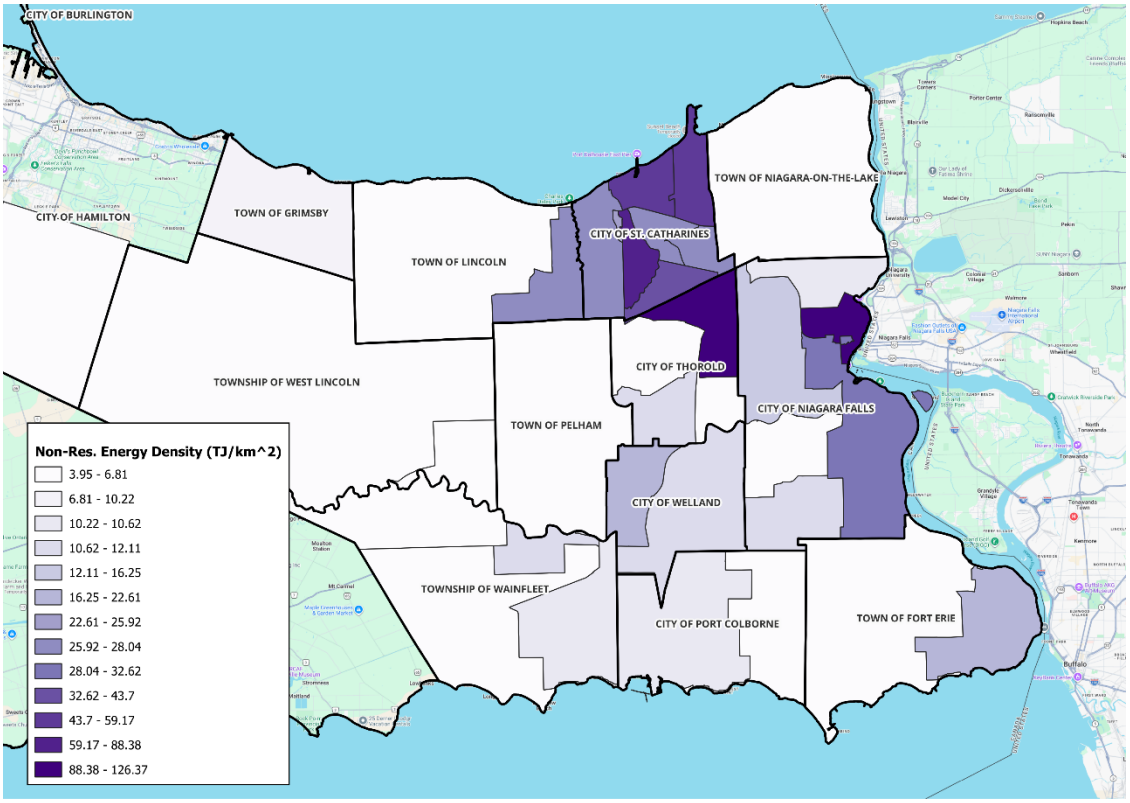
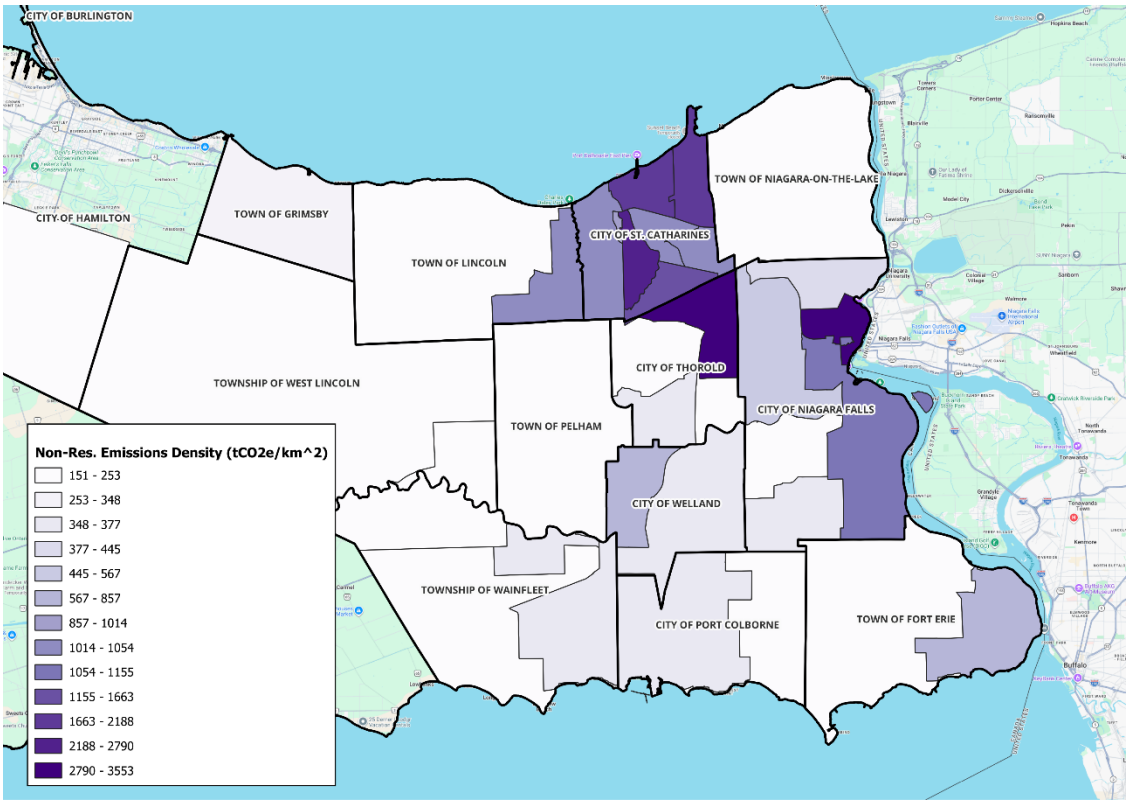


Figure 14 - Map: Non-Residential Emissions Density (tCO$_2$e/km^2)



Key insights from the spatial analysis include:

- **Energy and emissions generally move together**

  Areas with higher stationary energy consumption generally also have higher GHG emissions. Subtle differences between the energy and emissions maps mainly reflect fuel mix. For example, areas with a greater share of natural gas use tend to have higher emissions for a similar amount of energy because Ontario electricity has a much lower GHG emissions intensity.

- **Residential energy use varies significantly across Niagara**

  Average energy use per dwelling does not simply follow population or urban density. Higher mapped values are visible in the L0S FSA covering portions of Niagara-on-the-Lake, Pelham, and Wainfleet, as well as in parts of Thorold, Niagara Falls, and Fort Erie, while lower values are observed in parts of Lincoln, West Lincoln, and St. Catharines. These patterns may reflect differences in housing characteristics, heating requirements, and fuel mix, but should also be interpreted in the context of the FSA-level geographic limitations described above. The results provide an indication of where residential energy characteristics may differ and where further local analysis could help inform future retrofit or heating strategies.

- **Non-residential energy demand is more concentrated in urban and employment areas**

  The highest non-residential energy and emissions densities are generally found in St. Catharines and along parts of the St. Catharines-Thorold-Niagara Falls corridor. Larger rural FSAs generally have much lower energy use per square kilometre. This illustrates the concentration of commercial, institutional, and industrial activity within particular parts of the region. However, these maps should be interpreted cautiously because the industrial natural gas consumption that could not be geographically assigned may result in some industrial areas appearing less energy- and emissions-intensive than they are in practice.

Taken together, the maps provide a useful complement to region-wide and LAM-level results by showing where energy demand is concentrated, where residential energy characteristics differ, and where future CEP actions or infrastructure considerations may need to respond to local conditions.

2.5 Distributed Energy Resources in Niagara

As described in Section 1.3.2.4, the region has a range of DERs that supplement electricity supplied through Ontario's provincial grid. Unlike large, centralized generation facilities connected directly to the transmission system, DERs are typically located

closer to where electricity is consumed and can help reduce grid demand, improve local energy resilience, and support decarbonization objectives.

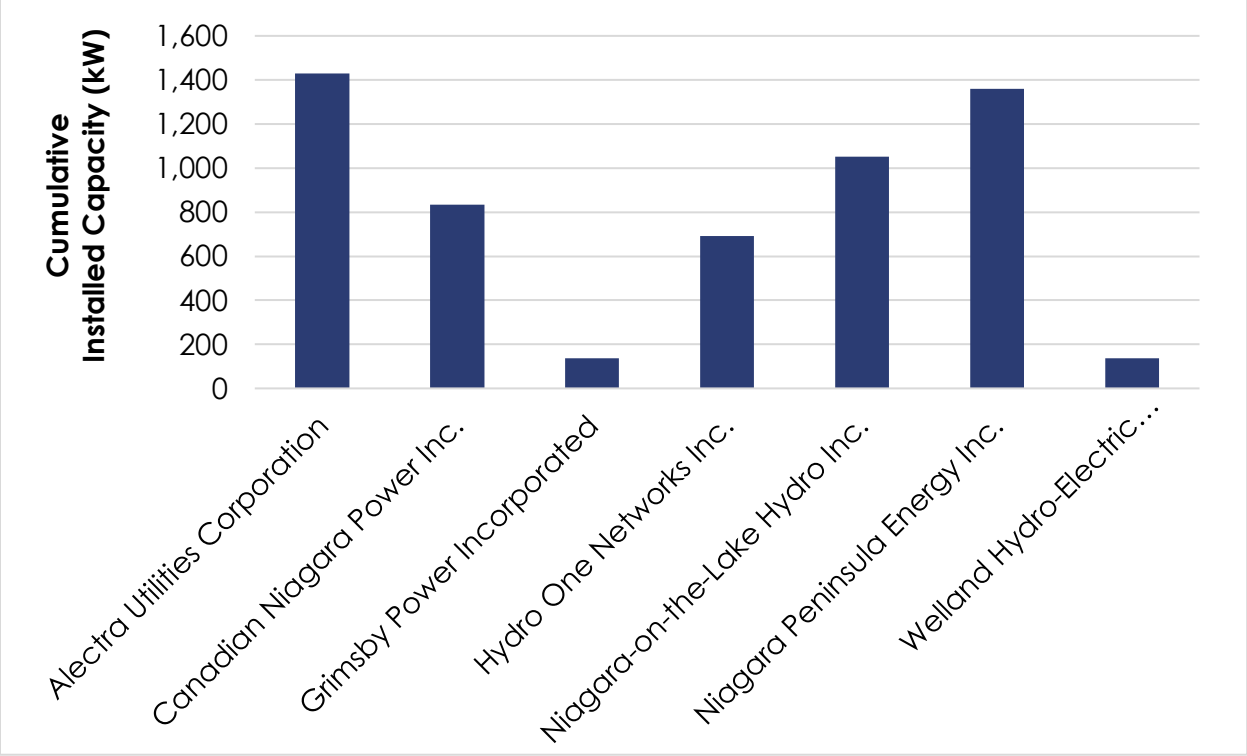
The cumulative installed capacity of net-metered and embedded generation resources is reported annually by LDCs to the OEB through Electricity Reporting and Record Keeping Requirements (RRR) filings. These datasets provide insight into the scale and technology mix of distributed generation operating within the Niagara region.

For LDCs whose service territories extend beyond the region, including Alectra Utilities and Hydro One, installed capacities were estimated based on the proportion of customers located within Niagara. While this approach introduces some uncertainty, particularly where large generation facilities may be concentrated within specific service areas, it provides a reasonable estimate of DER adoption across the region and allows for analysis of generation technology trends.

2.5.1 Net-Metered Capacity

Figure 15 summarizes the cumulative installed net-metered generation capacity across the Niagara region by LDC service territory. In total, the region has an estimated 5,640 kW (5.64 MW) of installed net-metered capacity.

Figure 15 - Net-Metered - Cumulative Installed Capacity (kW) by LDC



Net-metered generation in Niagara is overwhelmingly dominated by solar photovoltaic (PV) systems, which account for more than 99% of installed capacity. Small amounts of wind generation and energy storage capacity are also present but represent a negligible

share of the overall total. This technology mix is consistent with Ontario's net-metering framework, as Ontario Regulation 541/05 requires eligible generators to generate electricity solely from renewable energy sources. Solar PV dominates because it remains one of the most cost-effective, scalable, and easily deployable renewable generation options for energy users.

The dominance of solar PV highlights the growing role that customer-owned renewable energy systems can play in Niagara's future energy system. Continued electrification, declining equipment costs, and increasing interest in energy resilience may support further growth in solar and battery storage systems over the coming decades.

2.5.2 Embedded Generation Capacity

Figure 16 summarizes the cumulative embedded generation capacity across the Niagara region by LDC, while Figure 17 illustrates the distribution of capacity by generation type. In total, the region has an estimated 106,300 kW (106.3 MW) of installed embedded generation capacity.

Figure 16 - Embedded Generation - Cumulative Installed Capacity (kW) by LDC

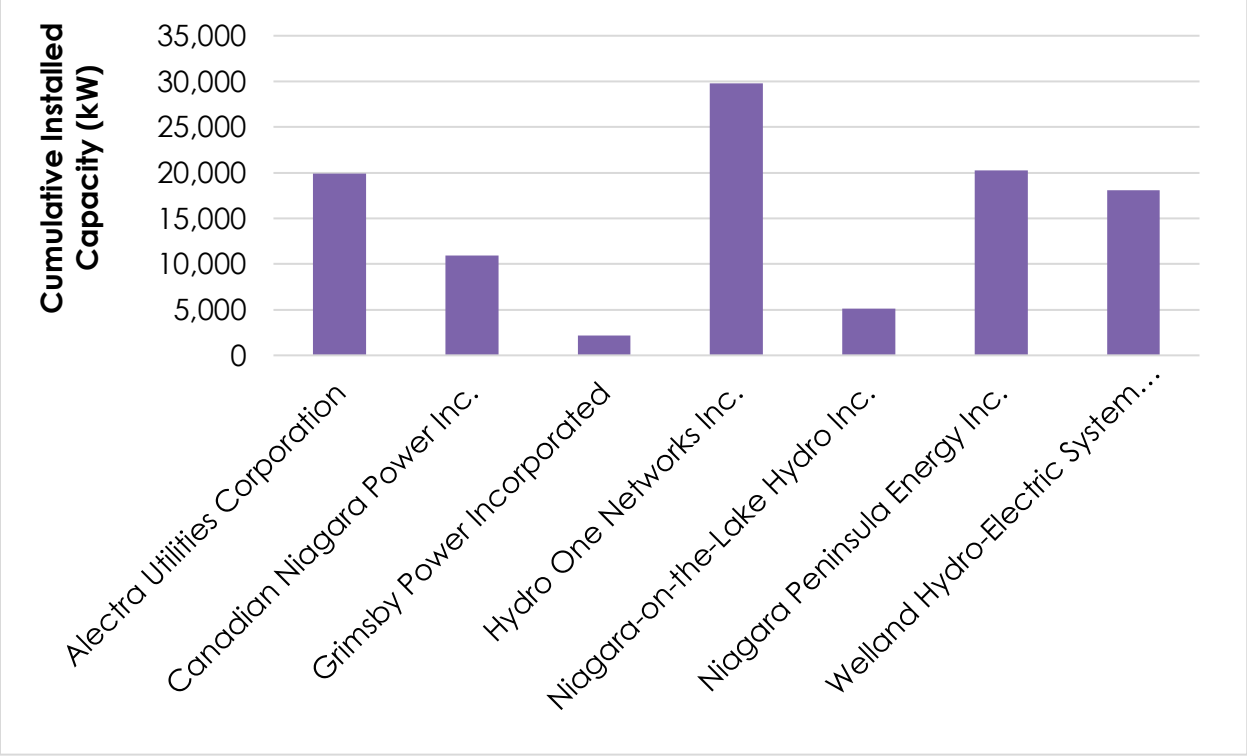
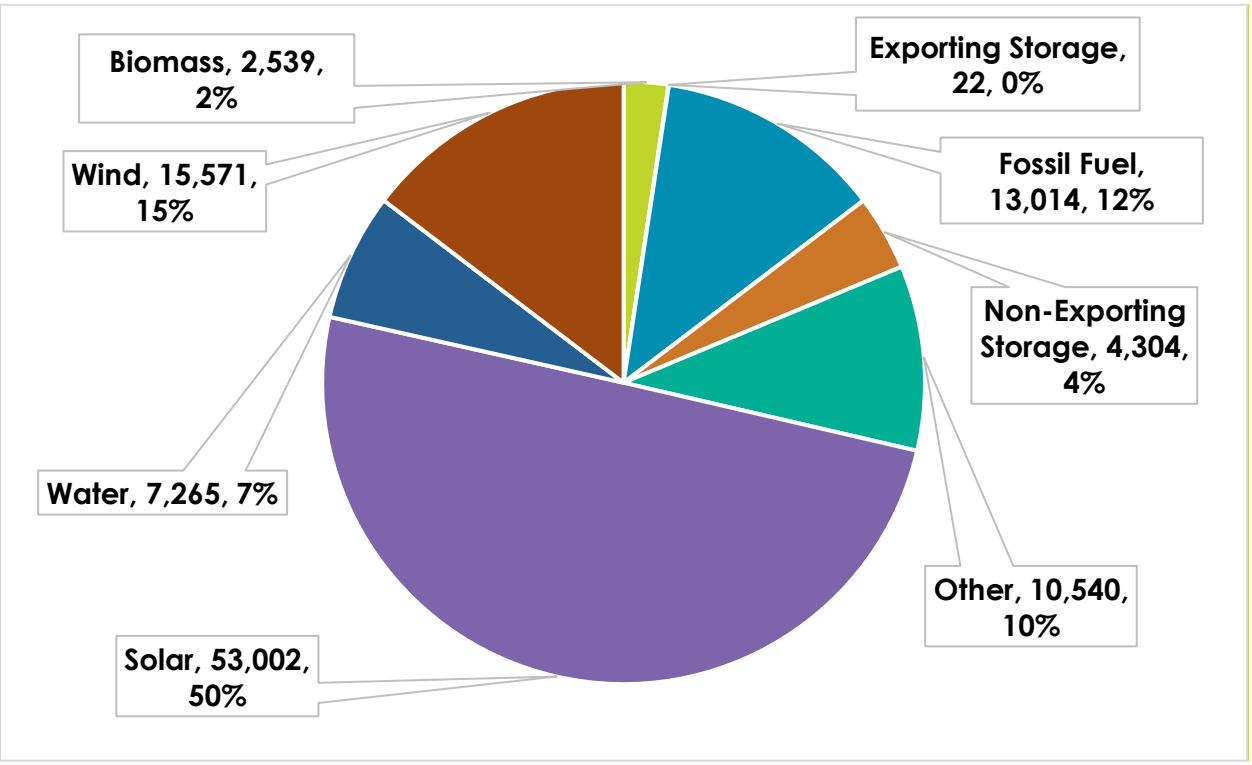


Figure 17 - Embedded Generation Capacity (kW) by Type



For context, the 2022 Niagara Integrated Regional Resource Plan (IRRP) reported regional coincident peak electricity demand of approximately 925 MW in 2022[5]. The 106.3 MW of embedded generation capacity identified here is equivalent to approximately 11% of that peak demand.

Embedded generation capacity in Niagara is substantially larger and more diverse than the region's net-metered generation capacity. Unlike net-metered generation, embedded generation is not limited to renewable energy technologies, which allows for a broader mix of generation types. However, renewable resources still represent most of the embedded generation capacity in the region. Solar, wind, water, and biomass generation collectively account for approximately 75% of total embedded generation capacity.

The fossil fuel generation category is expected to consist primarily of natural gas-fired combined heat and power (CHP)/cogeneration systems located at industrial and large commercial facilities. These systems generate electricity while simultaneously capturing waste heat for space heating, domestic hot water, or industrial processes, resulting in higher overall energy efficiency than separate heat and power production. Many such projects were installed through previous conservation and distributed generation

[5] 2022 Niagara Integrated Regional Resource Plan - IESO

incentive programs, including legacy Save on Energy initiatives administered by the IESO.

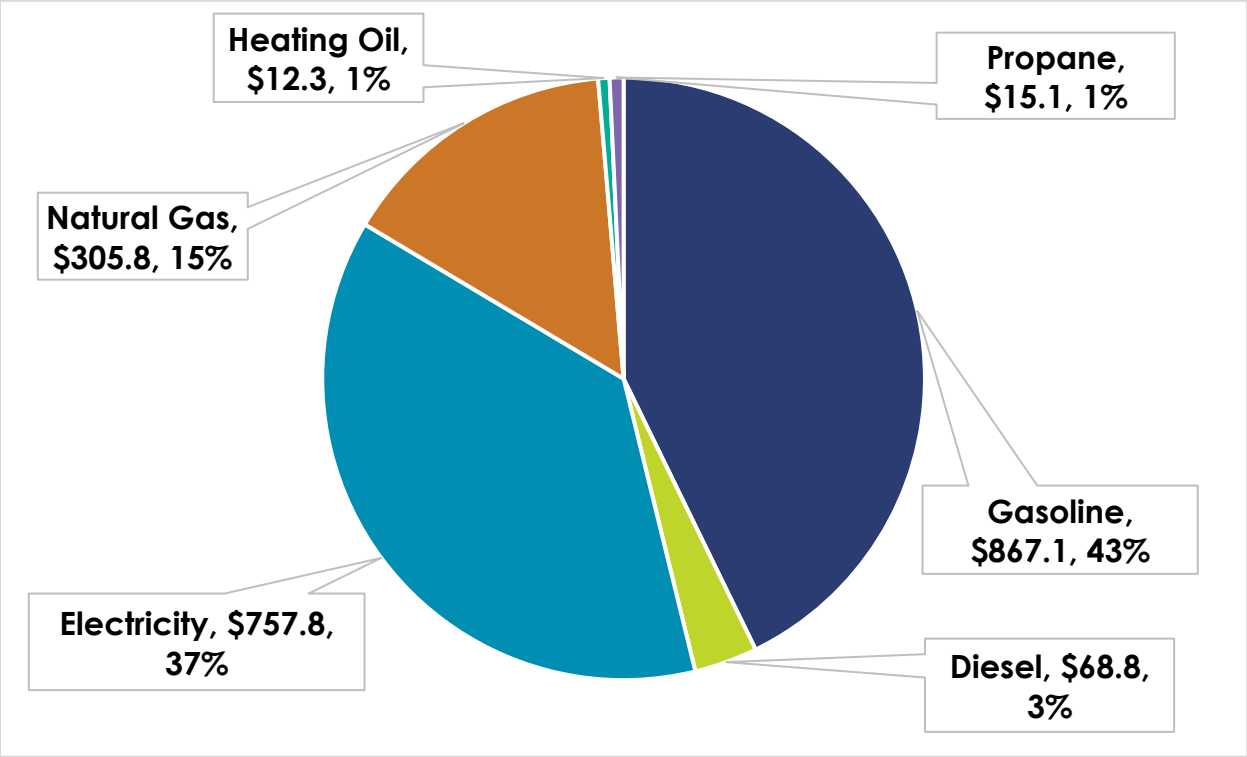
The “Other” generation category is expected to consist primarily of waste energy recovery systems serving industrial facilities. These systems generate electricity from energy streams that would otherwise be lost, such as waste heat from industrial processes, pressure reduction systems, or by-product gases. While site-specific details are not available through the OEB reporting data, this category likely reflects specialized generation systems installed to improve energy efficiency and make use of existing industrial energy flows.

The range of embedded generation technologies in Niagara shows that DERs are not limited to a single technology or use case and already form a diverse part of the region’s local electricity supply mix. As electrification increases and electricity demand grows, embedded generation and energy storage resources may play an increasingly important role in supporting local grid capacity, improving resilience, and reducing the need for traditional utility infrastructure investments.

2.6 Energy Spend in Niagara

Energy represents a significant annual expense for households, businesses, institutions, and governments in the Niagara region. Based on estimated 2024 energy consumption and average energy prices, approximately **$2 billion** is spent each year on electricity, natural gas, gasoline, diesel, propane, and heating oil in the region. Figure 18 shows the estimated expenditure broken down by fuel type.

Figure 18 - Est. Annual Community Energy Expenditure ($millions) by Fuel Type



A large share of energy dollars leaves the local economy. Community energy plans across Ontario have estimated that approximately 75–85%[6] of energy spending flows outside the community to purchase fuels, electricity generation, and wholesale energy services. Niagara may differ from this range given the region's unique energy profile, including the presence of significant hydroelectric generation. However, a substantial portion of Niagara's energy spending is expected to leave the local economy based on the region's overall energy supply and consumption patterns.

The scale of this spending becomes more significant when considered over the CEP planning horizon. As an illustrative example, if current annual energy spending increased by a conservative 2% per year, cumulative spending from 2025 through 2050 would total approximately $67 billion. If the estimated 75–85% share of energy spending that leaves the local economy remained similar over that period, this would represent approximately $50–57 billion flowing outside Niagara. These values are illustrative rather than a forecast, but demonstrate the scale of the long-term economic opportunity associated with reducing energy costs and retaining a greater share of energy-related investment and activity locally.

How much money remains in the local economy depends on the energy source. Electricity bills are paid to local electricity distributors, but electricity supply is part of

[6] City of Windsor - Community Energy Plan (2017)

Ontario's integrated grid and wholesale electricity market. Although Niagara hosts significant hydroelectric generation, electricity consumed in Niagara is not directly purchased from or attributable to these local generating facilities. Electricity commodity and generation costs therefore largely flow through the provincial electricity system and to generation owners. Local generation does, however, provide economic benefits through employment, operations, maintenance, and related activity within Niagara.

Natural gas payments largely leave the region through gas supply and transmission costs, with only a portion supporting local distribution operations and maintenance. Similarly, most spending on gasoline and diesel leaves the region through national and international fuel supply chains, with local economic benefits generally limited to fuel retailers and their employees.

Reducing overall energy costs and increasing the share of energy spending retained within Niagara are related but distinct opportunities that will be explored through the CEP. Actions such as improving energy efficiency, electrifying buildings and transportation, and designing communities that reduce vehicle travel can reduce overall energy consumption, emissions and costs. Other opportunities, including increased local energy generation and investment in local energy infrastructure and services, may help retain a greater share of energy-related spending and economic activity within Niagara. Together, these approaches can support local investment, employment, energy resilience, and GHG emissions reductions.

2.7 Benchmarking

Benchmarking provides useful context by comparing Niagara region's energy consumption and GHG emissions with those of other municipalities and regions. While every community has unique characteristics, benchmarking helps identify broad trends, provides an indication of relative performance, and highlights how factors such as population, land use, climate, transportation patterns, and industrial activity influence overall energy use and emissions. It also provides context for future target setting and helps assess whether changes observed over time are consistent with trends in other regions.

Direct comparisons should be interpreted with caution. Community energy inventories can differ in their geographic boundaries, emission sources included, data availability, calculation methodologies, and underlying assumptions. These differences can result in variations between published metrics even where communities have similar characteristics. For this reason, benchmarking is most valuable as a directional comparison rather than a definitive measure of performance.

Table 3 compares Niagara region with several municipalities and regions that have publicly available community energy or greenhouse gas inventories. These comparators were selected because they share the same 2024 baseline year, have broadly

comparable inventory boundaries, and are either geographically close to Niagara or have similar population sizes. As such, they provide a meaningful basis for comparison.

Table 3 - Energy and Emissions Benchmarks

Municipality/ Region	Population	Source	Baseline or Inventory Year	Metric and Value	Niagara Region Comparable
City of London	466,000	2024 Community Energy Use and Greenhouse Gas Emissions Inventory[7]	2024	• 57.9 PJ total energy consumption • 124 GJ per capita • 3.03 $MtCO_2e$ total emissions • 6.5 tCO_2e per capita	• 69.1 PJ total energy consumption • 127 GJ per capita • 3.35 $MtCO_2e$ total emissions • 6.2 tCO_2e per capita
Durham Region	758,828	The Atmospheric Fund (TAF) 2024 GTHA Carbon Emissions Inventory, Durham Region[8]	2024	• 5.6 $MtCO_2e$ total emissions • 7.3 tCO_2e per capita	• 3.35 $MtCO_2e$ total emissions • 6.2 tCO_2e per capita
Halton Region	635,589	The Atmospheric Fund (TAF) 2024 GTHA Carbon Emissions Inventory, Halton Region[9]	2024	• 5.0 $MtCO_2e$ total emissions • 7.8 tCO_2e per capita	• 3.35 $MtCO_2e$ total emissions • 6.2 tCO_2e per capita
Hamilton	612,678	The Atmospheric Fund (TAF) 2024 GTHA Carbon Emissions Inventory, Hamilton[10]	2024	• 9.5 $MtCO_2e$ total emissions • 15.5 tCO_2e per capita	• 3.35 $MtCO_2e$ total emissions • 6.2 tCO_2e per capita

[7] City of London - 2024 Community Energy Use and Greenhouse Gas Emissions Inventory
[8] Durham - 2024 GTHA Carbon Emissions Inventory
[9] Halton - 2024 GTHA Carbon Emissions Inventory
[10] Hamilton - 2024 GTHA Carbon Emissions Inventory

The benchmarking results show that Niagara's per capita energy use is comparable to that of the City of London. Niagara's per capita GHG emissions are lower than all the comparable regions cited (London, Durham Region, Halton Region, Hamilton). The largest difference is observed with Hamilton, where per capita GHG emissions are more than double those of Niagara. This is largely attributable to Hamilton's significant concentration of heavy industry and steel manufacturing, which contributes substantially to community-wide emissions. These comparisons illustrate that community energy and emissions profiles are influenced not only by population, but also by factors such as industrial activity, land use, economic composition, and transportation patterns. As a result, benchmarking results should always be interpreted within the context of each community's unique characteristics.

As the CEP is implemented, these benchmark communities can serve as reference points for monitoring Niagara's progress over time. Tracking changes relative to peer municipalities can help identify emerging trends, evaluate the effectiveness of local actions, and inform future updates to the CEP.

Other municipalities and regions developing or implementing CEPs can also provide useful examples of actions, delivery approaches, partnerships, and implementation models that may be relevant to Niagara.

2.8 Additional Context and Planning Indicators

The energy and emissions results presented above establish how much energy is used in Niagara and where associated GHG emissions originate. However, energy use is also shaped by the age and type of buildings, how people travel, local economic activity, household affordability, population growth, and the timing and location of electricity demand.

The indicators in this section provide additional context for interpreting the baseline and identifying priorities as the CEP is developed. They are intended to support discussions by the Steering Committee (SC) and Working Groups (WGs) as they move from baseline review into scenario and action development. Further information on these engagement parties, including a description of the 5 thematic WGs, can be found in Section 3.3.

Wherever possible, Niagara-specific data are used. Where suitable local data are not available, Ontario or Canada-wide information is identified as a contextual benchmark.

2.8.1 Existing Buildings and Heating

Niagara's residential energy transition will occur largely within an existing, low-rise building stock. Approximately 66% of occupied dwellings are single-detached homes, while approximately 83% are ground-oriented forms when single-detached, semi-detached, row houses, and duplex apartments are combined. The housing stock is also

relatively mature: approximately 61% of occupied dwellings were built before 1981 and 81% before 2001[11].

Building age and type do not determine energy performance on their own, as many older buildings have already been upgraded. However, these characteristics demonstrate the scale of the existing-building opportunity. Most of the homes that will be occupied during the CEP planning horizon have already been built, meaning that improvements to existing buildings will need to occur alongside higher performance standards for new development. This is particularly relevant to WG2's focus on retrofits, building performance, growth, and development.

Heating is especially important. IESO research indicates that space heating accounts for approximately 60% of total energy use in both Ontario's residential and commercial sectors. Natural gas currently supplies approximately 72% of residential space-heating energy and 89% of commercial space-heating energy[12]. This reinforces that building decarbonization is largely a heating challenge. Energy efficiency, envelope improvements, heat recovery, heating-system upgrades, and lower-carbon heating technologies can all play a role. District energy and thermal networks may also provide opportunities to integrate heating and cooling demands and make use of local or recovered energy sources where development patterns and local conditions support them. As more heating is electrified, these building decisions will also increasingly affect electricity demand and infrastructure requirements.

2.8.2 Industrial Energy Use

Industrial energy use differs considerably from residential and commercial buildings because it is driven heavily by the processes taking place within a facility. Manufacturing, agri-food, greenhouse operations, and other Niagara industries can have very different requirements for process heating, refrigeration, compressed air, motors, pumps, and other equipment. For this reason, a single typical industrial end-use profile would provide limited value for the CEP.

Natural Resources Canada (NRCan) estimates that industrial energy systems, including combustion, process heating, combined heat and power, compressed air, motors, pumps, and fans, account for approximately 80% of energy used by Canadian industry[13]. On average, an estimated 30% to 40% of the energy entering these systems is lost. This points to opportunities beyond traditional building retrofits, including process optimization, waste heat recovery, heat integration, motor and compressed-air improvements, and electrification where technically and economically appropriate.

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[11] Profile table, Census Profile, 2021 Census of Population - Niagara, Regional Municipality
[12] IESO Demand & Conservation Planning Technical Paper: Space Heating (July 2025)
[13] Industrial Energy Systems - Natural Resources Canada

For the CEP, industrial opportunities will therefore need to be considered on a sector- and facility-specific basis. Engagement with Niagara's larger energy users will be important for understanding the processes driving consumption and identifying practical opportunities that are not evident from the community-wide utility data analysis alone.

2.8.3 Transportation and Electrification of Vehicles

Niagara remains highly dependent on personal vehicles. In 2021, approximately 85% of commuters drove a car, truck, or van as their main mode of commuting. A further 7% travelled as passengers in one of these vehicles. Public transit accounted for less than 2% of commuting, while walking and cycling combined accounted for approximately 4%[11].

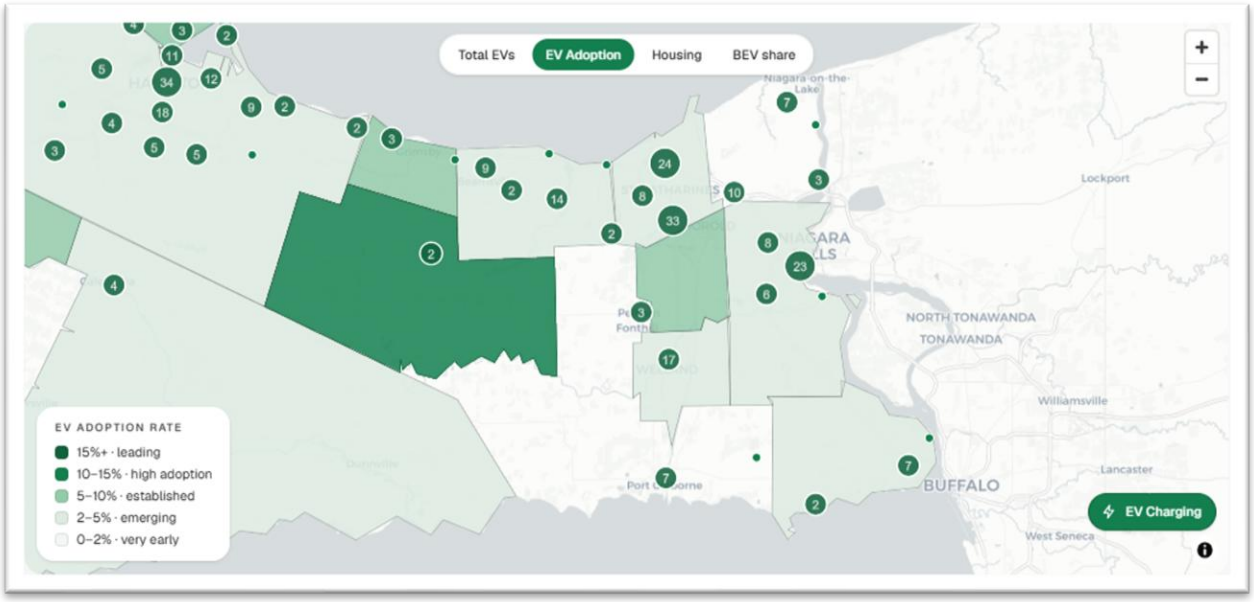
This context is important given that transportation accounts for approximately 43% of Niagara's baseline GHG emissions. Reducing these emissions will likely require complementary approaches. Electrification can substantially reduce emissions from trips that continue to be made by vehicle, while transit, active transportation, more complete communities, and integrated land use planning can reduce the number and length of vehicle trips where practical. This aligns directly with WG4's mandate to consider electrification, transit, active transportation, rural mobility, tourism, and goods movement together rather than as separate issues.

EV adoption is already increasing across Niagara. Based on Ontario's Q2 2026 registration data, nearly 9,000 EVs are registered in Niagara-relevant FSAs, with 68% of EVs being battery electric vehicles (BEVs) and the remaining 32% being plug-in hybrid electric vehicles (PHEVs)[14].

EV Index[15], which leverages the same EV registration dataset, provides additional local context by spatially allocating registrations from FSAs that cross municipal boundaries and comparing the estimated registrations with household counts[16].

[14] Electric Vehicles in Ontario – By Forward Sortation Area - Dataset - Ontario Data Catalogue
[15] Ontario EV adoption | EV Index
[16] Methodology | EV Index - EV Index defines EV Adoption as the number of registered BEVs + PHEVs divided by the 2021 Census household count for the applicable municipality. It should therefore be interpreted as EV registrations relative to households, not as the percentage of the total vehicle fleet that is electric. EV Index municipal estimates spatially allocate MTO FSA-level registrations where FSAs cross municipal boundaries.

Figure 19 - EV Index Niagara Region EV Adoption and Public Charging Map



EV adoption is uneven across Niagara

The results show that EV adoption is far from uniform across Niagara. West Lincoln is a notable outlier, with an estimated 12.3% adoption rate in Q2 2026, approximately 2.7 times the Ontario average of 4.6% and the fifth-highest rate among the 70 Ontario municipalities tracked by EV Index. Grimsby (6.7%) and Thorold (5.6%) are also above the provincial average. By comparison, Niagara Falls is estimated at 3.7%, Fort Erie at 3.1%, St. Catharines at 2.7%, and Welland at 2.3%. These differences show that EV adoption is not simply an urban trend and that charging and electricity infrastructure needs may emerge at different rates across the region.

Public charging availability is uneven

The current distribution of charging infrastructure is also uneven. Using EV Index's[15] measure of registered EVs per public charging station, Ontario has approximately 53 EVs for every public charging station. Several Niagara communities have greater public charging availability relative to their registered EV population, including West Lincoln at approximately 12 EVs per station, Niagara Falls at 19, and Fort Erie at 14. Grimsby stands out in the opposite direction, with approximately 194 EVs per public charging station, despite having one of Niagara's higher EV adoption rates. These figures are a high-level indicator rather than a measure of actual charging capacity, but they highlight the importance of considering charger location, charging speed, accessibility, and intended users. This is particularly relevant in Niagara given the needs of residents, visitors, longer-distance travelers, and commercial and fleet operators.

Charging timing matters

In addition to location, the timing of charging is also important. EVs can be charged at homes, workplaces, commercial charging stations, and other locations, giving considerable flexibility in when electricity is consumed. IESO research acknowledges that this flexibility creates opportunities to manage charging, but also that concentrated EV adoption can create local impacts earlier in some parts of the distribution system than others[17]. As adoption grows, the location and timing of charging will therefore become increasingly important considerations for both transportation planning and grid readiness.

2.8.4 Affordability and Participation

The ability to participate in Niagara's energy transition will vary across households. In 2021, approximately 21% of Niagara households spent 30% or more of their income on shelter costs, while approximately 10% were in core housing need. Affordability pressures were substantially greater for tenants, with approximately 40% spending 30% or more of their income on shelter and approximately one-quarter in core housing need[11].

Energy affordability provides another perspective. Statistics Canada defines direct energy poverty as a household spending 10% or more of its after-tax income on dwelling energy costs. Approximately 4.8% of Ontario households met this threshold in 2021[18]. This is an Ontario-wide benchmark rather than a Niagara-specific estimate, but it provides useful context for considering the relationship between energy use, income, housing condition, and affordability.

These considerations are important because not all households face the same opportunities to participate in the energy transition. A homeowner may be able to replace a heating system, improve insulation, or install an EV charger, while a renter may have little control over these decisions. Similarly, the upfront costs of retrofits and new technologies may create barriers even where they reduce long-term energy costs. WG5 will therefore consider affordability and accessibility alongside the technical potential of CEP actions.

2.8.5 Growth and Tourism

Niagara's future energy system will need to support considerably more people and economic activity than it does today. Updated projections from Niagara Region's Growth Management and Analytics division estimate approximately 817,345 residents and 267,225 jobs by 2051, representing approximately 273,000 additional residents and 73,000 additional jobs compared with 2024.

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[17] IESO Demand & Conservation Planning Technical Paper: Electric Vehicles (July 2025)
[18] Estimation of Energy Poverty Rates Using the 2021 Census of Population

This growth means that the CEP is not just about reducing today's energy consumption. New housing, employment areas, transportation systems, water and wastewater infrastructure, and other community services will create additional energy demand. How and where that growth occurs will influence the amount and type of new infrastructure required, reinforcing the need to coordinate land use and energy planning.

Tourism adds another distinctive layer to Niagara's energy profile. Niagara recorded approximately 7.5 million visitor trips and 13.0 million visitor nights in 2025. Tourism supported approximately 36,300 jobs and generated approximately $3.8 billion in visitor expenditures. Visitation also varies significantly by season, with approximately 2.7 million trips occurring during the third quarter of 2025 compared with approximately 1.2 million in the first quarter[19].

As a result, some of Niagara's transportation fuel consumption, commercial energy use, transit activity, congestion, and future EV charging demand is associated with visitors rather than residents. This is particularly important when interpreting per capita metrics and when planning infrastructure that may need to accommodate seasonal peaks substantially above resident demand.

2.8.6 A Changing Electricity Demand Profile

Many of the trends discussed above point toward a greater role for electricity in Niagara's future energy system. Building electrification, EV adoption, economic growth, and new development can all increase electricity demand even as overall energy efficiency improves.

The IESO's 2026 Annual Planning Outlook illustrates the scale of this change across Ontario. Under its reference scenario, annual electricity demand is forecast to increase from approximately 152 TWh (terawatt-hours) in 2026 to 250 TWh by 2050, an increase of approximately 65%[20]. The Outlook identifies electrification, industrial development, new commercial loads, and economic growth among the factors shaping future demand.

Importantly, electricity planning depends on more than annual energy consumption. The timing of demand also matters. Electrified heating can increase demand during cold winter conditions, while EV charging can shift significant new loads into evening or overnight periods depending on how charging is managed. These changing load patterns can have implications for electricity generation, transmission, distribution infrastructure, and peak demand.

For Niagara, this creates an important connection between the CEP and ongoing electricity system planning. Energy efficiency, demand flexibility, DERs, storage,

[19] 2025 Niagara Tourism Profile - Niagara Economic Development
[20] IESO Annual Planning Outlook (March 2026) - Ontario's Electricity System Needs: 2027-2050

managed EV charging, and the timing of electrification may all influence how much new electricity infrastructure is ultimately required. These issues will be explored further through WG3 and coordination with Niagara's LDCs and the IESO.

Taken together, these indicators show that Niagara's energy transition is not only a question of how much energy is consumed. It is also a question of what energy is used for, where and when demand occurs, who is using it, and who has the ability to participate in the transition.

These considerations provide additional context for the WGs as they move from understanding Niagara's current energy profile toward establishing priorities, evaluating future scenarios, and developing CEP actions.

3. Baseline Study Insights and Next Steps

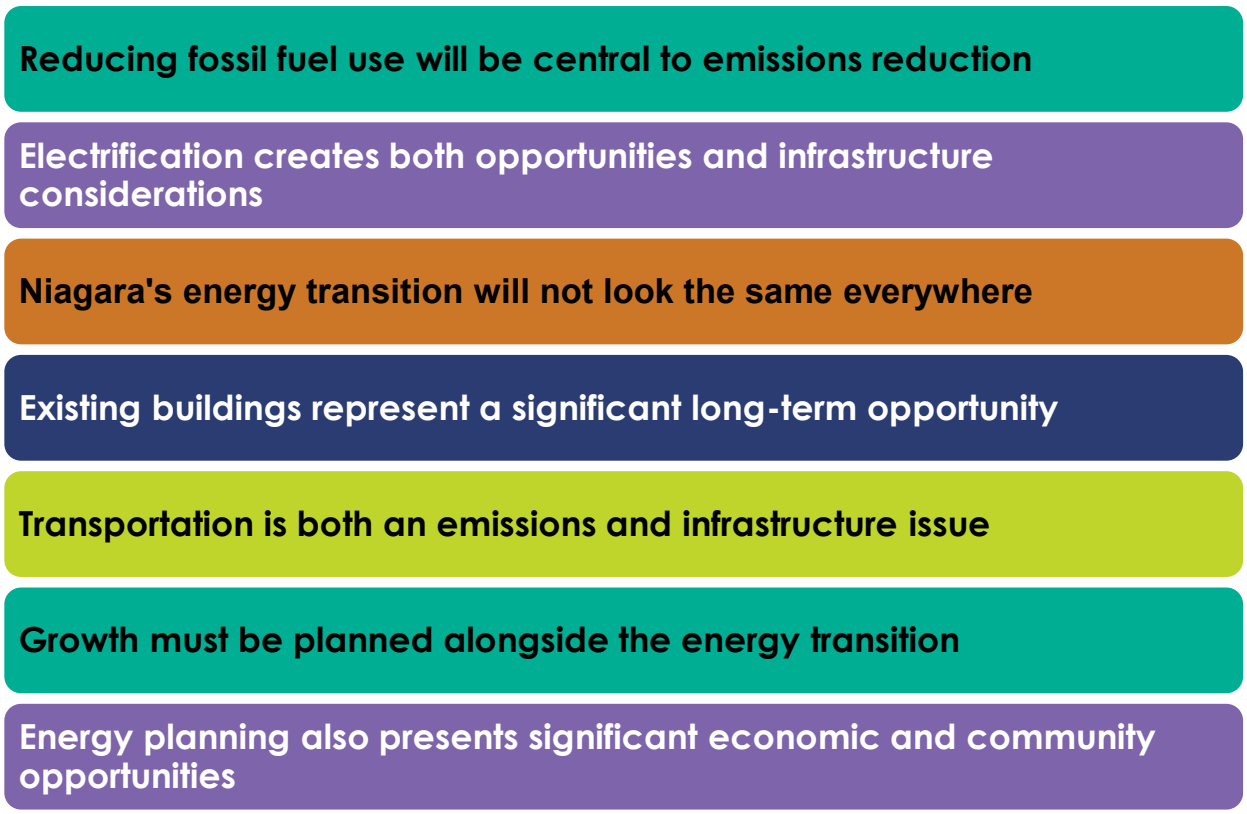
This study establishes a common understanding of how energy is currently used across Niagara, where GHG emissions originate, how energy use varies across the region, and several of the broader factors that will shape future demand. It is the starting point for the next stages of the CEP.

The baseline study findings will be considered alongside existing plans and infrastructure studies, technical analysis, and input from interested parties to develop the CEP's vision, future scenarios, priorities, and actions.

3.1 Key Insights for CEP Development

The detailed findings in Section 2 point to several high-level considerations that will carry forward into CEP development (Figure 20).

Figure 20 - Key Baseline Study Insights



These findings establish areas for further exploration throughout CEP development. The next stages of the process will test these opportunities against technical feasibility, cost, infrastructure requirements, community priorities, implementation barriers, and other considerations.

3.2 Integration of Existing Plans and Studies into CEP Development

In parallel with this study, a broad review of existing regional, municipal, utility, and provincial plans and studies is being undertaken to ensure the CEP is aligned with ongoing initiatives, infrastructure planning, and long-term growth objectives across Niagara. An annotated inventory of the plans and studies reviewed or identified as relevant to the CEP is provided in Appendix C.

This review includes regional and local official plans, land use and development plans, transportation and transit master plans, water and wastewater infrastructure plans, waste management plans, utility planning documents, and provincial energy strategies. Collectively, these documents help identify anticipated population and employment growth, planned development areas, infrastructure requirements, transportation system changes, and broader economic trends that will influence Niagara's future energy profile.

Several ongoing planning initiatives will be particularly important during forecasting, scenario development, and action planning. The Niagara Bulk Plan and IRRP, led through the regional electricity planning process involving Hydro One and the IESO, will help identify future electricity demand, system needs, and infrastructure considerations. Niagara Region's updated Transportation Master Plan (TMP) will similarly provide important direction related to transit, active transportation, road networks, goods movement, and future mobility. Coordination with these and other planning processes will continue as the CEP is developed.

This approach will help ensure that the CEP does not operate as a stand-alone energy plan, but instead supports coordinated decision-making across land use, infrastructure, transportation, utilities, economic development, and other regional and local priorities.

3.3 Engagement and Collaborative Development of the CEP

A CEP Engagement Plan has been developed to guide how interested parties will be involved throughout the development of the plan. The Engagement Plan establishes the overall engagement structure, participant groups, roles, and timing, and aligns engagement activities with key technical and decision-making milestones of the CEP.

Engagement will be integrated directly into CEP development. Interested parties will help interpret the baseline, identify opportunities and constraints, develop future direction, assess proposed scenarios and actions, and support implementation planning.

In alignment with the Engagement Plan, formation of the SC and WGs is occurring in parallel with completion of this study. Their formation will conclude shortly thereafter, allowing the findings of this study to serve as a common evidence base for the first stage of engagement.

These engagement bodies will play critical roles in collaborative development of the CEP.

Table 4 - SC and WG Composition and Roles

Group	Composition	Role in CEP Development
Steering Committee (SC)	Approximately 15-20 representatives from Niagara Region, LAMs, utilities and the IESO, public institutions, business and economic development organizations, and other key partners.	Provides governance oversight, considers and integrates WG recommendations into CEP direction, assesses cross-sector alignment and implementation feasibility, and provides direction at major CEP milestones. Where recommendations are not advanced, rationale is communicated back to the relevant WG as appropriate.

Group	Composition	Role in CEP Development
Working Groups (WGs)	Five thematic groups involving sector leaders, technical experts, utilities, businesses, institutions, community organizations, and other interested parties.	Serve as the primary forums for detailed engagement and collaborative development of CEP content, including priorities, scenarios, actions, barriers, partnerships, and implementation considerations.

The five thematic WGs focus on:

1. WG1: Energy Economy and Local Prosperity
2. WG2: Land, Place and Built Environment
3. WG3: Energy Systems and Infrastructure
4. WG4: Mobility and Transportation Systems
5. WG5: Equity and Community Well-Being

WG outputs will be brought forward to the SC at key milestones. Where further refinement is required, the relevant WG can be re-engaged before directions are advanced. Broad community and Indigenous engagement will also occur through the approaches established in the CEP Engagement Plan.

3.4 Next Steps and CEP Development Process

The baseline study represents the first stage of a broader, iterative process. Technical analysis and engagement will progress together so that each stage builds on the findings and decisions from the previous stage.

The CEP will generally be developed through the four-stage process shown in Table 5.

Table 5 - CEP Development Stages and Timing

Stage	Focus	How Baseline findings and Engagement inform the CEP	Indicative Timing
1. Baseline and Opportunity Framing	Establish the current energy and emissions profile and identify key questions and opportunities.	Baseline Study findings are reviewed with the SC and WGs to validate the starting point and identify priority issues for further investigation.	Q4 2026

Stage	Focus	How Baseline findings and Engagement inform the CEP	Indicative Timing
2. Vision and Strategic Priorities	Establish the desired future direction for Niagara's energy system.	WGs develop sector-specific visions, priorities, and desired outcomes. These inputs are consolidated to inform the overall CEP vision and scenario development.	Q1 2027
3. Scenario and Action Development	Evaluate future pathways and develop potential actions.	Technical modelling and supporting analysis are combined with WG input on feasibility, opportunities, barriers, partnerships, and implementation considerations.	Q2 2027
4. Validation and Implementation Readiness	Refine the preferred direction and prepare the CEP for implementation.	WGs and the SC review the emerging CEP, validate proposed directions and actions, and help identify implementation partners, priorities, and early actions.	Q4 2027

Engagement, technical analysis, and review of related plans and infrastructure studies will continue throughout all four stages. This iterative approach allows the CEP to move from an evidence-based understanding of Niagara's current energy system toward a locally informed and implementation-focused roadmap for its future.

The broader goal is to establish a collective impact network of organizations and community partners that can remain engaged beyond CEP development and continue to support coordination, accountability, and implementation over time.

Appendices

Appendix A – Data Sources, Methodologies and Assumptions

Data	Data Source	Spatial/LAM Allocation Method	Key Assumptions
Retail transportation fuel sales data	Kalibrate - Purchased Fuel Sales Data	Sales data broken out by LAM provided for seven (7) of Niagara's largest markets (Fort Erie, Grimsby, Niagara Falls, Port Colborne, St. Catharines, Thorold, Welland). Average sales per capita calculated and applied to the five (5) LAMs outside of Kalibrate's surveyed area (Lincoln, Niagara-on-the-Lake, Pelham, Wainfleet, West Lincoln).	Assumes sales are equal to consumption. Assumes average per capita retail fuel sales in the five LAMs outside Kalibrate's surveyed area are reasonably represented by the average of the seven surveyed LAMs.
Niagara Transit Commission (NTC) public transit fuel consumption	NTC Fleet Electrification Strategy and Implementation Roadmap Study - Table 1-1	Allocated consumption by LAM based on origin-destination (O-D) of route ridership data.	100% allocation if O-D are the same LAM, 50% to each LAM if they're different.
Metrolinx GO Train consumption	Metrolinx	Allocated consumption to LAMs based on population.	Assumes residents from all LAMs use GO Train routes and that their use is proportional to LAM population.
Niagara Region Corporate Fleet &	Niagara Region	Allocated consumption to LAMs based on population.	Assumes service levels are proportional to population.

Data	Data Source	Spatial/LAM Allocation Method	Key Assumptions
Rental fuel consumption			
LAM Fleet fuel consumption	LAM Public Works, Canada Clean Fuels	Data provided at the LAM level.	
NSTS School Bus Fleet fuel consumption	Niagara Student Transportation Services (NSTS)	Data provided at the LAM level.	
NR Waste Management fleet fuel consumption	Niagara Region Waste Management	Allocated consumption/emissions to LAMs based on population.	2023 data provided and used as an approximate estimate for 2024.
Niagara Parks Commission Fleet fuel consumption	Canada Clean Fuels	Allocated to LAMs along Niagara River corridor based on measured Niagara River corridor/frontage length within each municipality.	Assumes Niagara River corridor/frontage is a reasonable spatial proxy for Niagara Parks activity. Excludes LAMs without direct Niagara River corridor frontage.
Niagara Peninsula Conservation Authority fleet fuel consumption	Canada Clean Fuels	First allocated between Niagara and non-Niagara areas based on the share of the NPCA watershed located within Niagara Region. The Niagara portion was then allocated to LAMs based on each	Assumes watershed area is a reasonable spatial proxy for NPCA activity.

Data	Data Source	Spatial/LAM Allocation Method	Key Assumptions
		municipality's proportional land area within the Niagara portion of the watershed.	
Brock University fleet fuel consumption	Canada Clean Fuels	Allocated to St. Catharines.	
Electricity Consumption Data	Electricity LDCs (7) - Niagara-on-the-Lake Hydro - Alectra - Grimsby Power - Canadian Niagara Power - Niagara Peninsula Energy - Hydro One - Welland Hydro	Allocated to LAMs based on defined LDC service area or postal code/FSA. For FSA-level data spanning multiple LAM boundaries, consumption was either assigned to the primary LAM represented within the FSA or proportionally split between LAMs where a reasonable and defensible allocation could be determined based on available geographic information.	Utility data granularity was limited by privacy requirements. Allocations are considered reasonable estimates but introduce some uncertainty into LAM-level results, particularly for boundary-spanning FSAs.
Net-Metered and Embedded Generation data by LDC	OEB Electricity Reporting & Record Keeping Requirements (RRR): Sections 2.1.14 and 2.1.14.1 Net Metering	Total LDC data obtained from formal OEB reporting. For LDCs serving areas both inside and outside Niagara Region, installed capacities were estimated using the ratio of electricity customers within Niagara to total LDC customers.	Assumes distributed generation capacity is proportional to customer counts within each LDC service territory.

Data	Data Source	Spatial/LAM Allocation Method	Key Assumptions
	and Embedded Generation Information		
Natural Gas Consumption Data	Enbridge	Allocated to LAM based on postal code/FSA.	Utility data granularity was limited by privacy requirements. Allocations are considered reasonable estimates but introduce some uncertainty into LAM-level results, particularly for boundary-spanning FSAs.
Heating Oil and Propane Consumption Data	NRCan Office of Energy Efficiency: Comprehensive Energy Use Database – Residential Sector (Ontario), Secondary Energy Use and GHG Emissions by Energy Source	No reliable, regional energy consumption data available. Top-down approach followed. Provincial consumption data used to estimate energy per household. Household data (number of households) for the Region and LAMs used to allocate spatially.	Provincial consumption data used to estimate energy/household. 2022 data available and used as an approximate estimate for 2024.

Appendix B – Conversions and Factors

Data	Value	Source
Emissions Factor - Ontario Marketable Natural Gas	1,931 gCO_2e/m^3	1990-2024 National Inventory Report (NIR)[21]
Emissions Factor - Ontario Electricity	73 gCO_2e/kWh	NIR[21]
Emissions Factor - Diesel	2,738 gCO_2e/L	NIR[21]
Emissions Factor – Diesel (Train)	2,957 gCO_2e/L	NIR[21]
Emissions Factor - Gasoline	2,317 gCO_2e/L	NIR[21]
Emissions Factor - Propane	1,544 gCO_2e/L	NIR[21]
Emissions Factor - Heating Oil	2,755 gCO_2e/L	NIR[21]
Energy Conversion - Various	Various	Canada Energy Regulator Energy Conversion Tables[22]
Energy Rate - Gasoline	$1.50/L	Estimated based on publicly available fuel data for 2024.
Energy Rate - Diesel	$1.55/L	Estimated based on publicly available fuel data for 2024.
Energy Rate - Electricity	$0.15/kWh	Estimated based on publicly available fuel data for 2024.
Energy Rate - Natural Gas	$0.40/$m^3$	Estimated based on publicly available fuel data for 2024.
Energy Rate - Heating Oil	$1.55/L	Estimated based on publicly available fuel data for 2024.

[21] Canada's Official Greenhouse Gas Inventory - Open Government Portal
[22] Energy conversion tables - Canada.ca

Data	Value	Source
Energy Rate - Propane	$1.00/L	Estimated based on publicly available fuel data for 2024.

Appendix C – Annotated Inventory of Reviewed Plans and Studies

This inventory summarizes the plans, strategies and studies reviewed or identified as relevant to the Niagara CEP.

The Baseline Study itself is primarily based on measured energy and activity data. The document review completed to date has focused on identifying information that can inform later stages of the CEP to ensure alignment of outcomes with existing initiatives. The relationship and specific relevance of available documents to the CEP are provided as a reference for the CEP Project team, SC and WG members. This list is intended to ensure consideration where the content is material to the CEP during forecasting, scenario modelling, action development and implementation planning activities.

There are several related plans that are either under development or undergoing an update. In some cases, the CEP Project team members are in communication or collaboration with the respective plan developers. As these documents become available, the relevant CEP contributors will be informed.

Plan/Study Type	Document(s)	Relationship to the CEP	Relevant WGs
Provincial energy policy	Ontario, Energy for Generations: Ontario's Integrated Plan to Power the Strongest Economy in the G7 (2025)	Provides the provincial policy context for electricity and natural gas planning, conservation, new supply, transmission, affordability, reliability and Indigenous participation. It will help frame assumptions and constraints for future energy scenarios and local energy actions.	Primary context for WG3, with relevance to WG1 and WG5.
Regional corporate climate plan	Niagara Region Corporate Climate Change Action Plan (2025)	Establishes the Region's corporate net-zero direction and actions for facilities, fleets and other operations. It can inform community-facing actions where the Region can lead, demonstrate approaches or align corporate investments with the CEP.	Relevant to WG2, WG3 and WG4.

Plan/Study Type	Document(s)	Relationship to the CEP	Relevant WGs
Regional energy management plan	Niagara Region Conservation and Demand Management Plan (2024-2028)	Documents Regional facility energy use, completed measures, renewable generation, a 20% facility emissions-reduction goal and planned efficiency and fuel-switching work. It provides local examples, costs and implementation considerations for buildings and water/wastewater operations.	Relevant to WG2 and WG3, with examples for WG1.
Regional corporate GHG inventory	Niagara Region 2018 Corporate Baseline GHG Emissions Inventory	Provides the earlier corporate baseline for Regional facilities and operations. Although it is narrower than the community inventory, it supports continuity with the Region's climate work and helps distinguish corporate sources and responsibilities within the broader community context.	Relevant across WG2, WG3 and WG4.
Regional electricity planning	• Hydro One, Needs Assessment Report: Niagara Region (2021) • IESO, Niagara Region Scoping Assessment Outcome Report (2021) • IESO, Niagara Integrated Regional Resource Plan (IRRP), Appendices and Data Tables (2022) • Hydro One, Niagara Regional Infrastructure Plan (2023)	The completed 2021-2023 planning documents describe Niagara's electricity system, demand forecasts, identified needs, option analysis and planned infrastructure. They provide context for how electrification, growth and new loads may affect the regional system. The Niagara Bulk Plan and updated IRRP are currently in development in parallel with the CEP timeline. As information from these updates becomes available, it will provide current forecasts, system needs and infrastructure considerations. Coordination will help align CEP scenarios and actions with current electricity planning.	Primary context for WG3, with relevance to WG1 and WG2.

Plan/Study Type	Document(s)	Relationship to the CEP	Relevant WGs
	Niagara Bulk Plan and next-cycle Niagara Integrated Regional Resource Plan (in progress)		
Regional land use and growth	Niagara Official Plan (adopted 2022; May 2024 consolidation)	Provides the 2051 population and employment forecasts, growth allocations, settlement structure, employment areas, intensification direction and policies for climate, transportation and infrastructure. These inputs will inform the business-as-usual forecast, spatial analysis and assumptions about future buildings and travel.	Primary context for WG2, with relevance across all WGs.
Local land use and development	• Current Local Area Municipal official plans • Secondary plans Major development or growth-area plans (versions vary by municipality)	Add local detail on planned housing and employment growth, density, building form, development phasing and major sites. Relevant documents will be used where they materially improve the spatial allocation of future energy demand or the design of location-specific actions.	Primary context for WG2, with relevance to WG1, WG3 and WG4.
Regional transportation	Niagara Region Transportation Master Plan (2017, 2026 update in progress)	Provides existing and future travel patterns, road and active transportation networks, goods movement, mode-share direction and transportation demand under growth. Available data may inform vehicle activity, mode-shift and electrification assumptions; the update will be incorporated as relevant outputs become available.	Primary context for WG4, with relevance to WG2 and WG3.

Plan/Study Type	Document(s)	Relationship to the CEP	Relevant WGs
Regional public transit	Niagara Transit Master Plan / 10-Year Investment and Growth Strategy (2026-2035; released 2025) and Niagara Transit Fleet Electrification Strategy and Implementation Roadmap (2026)	Provide planned service expansion, fleet growth, facility investment and the timing and infrastructure needs for bus electrification. These inputs can inform transit energy demand, avoided fuel use, charging loads, mode-shift potential and equitable access to mobility.	Primary context for WG4, with relevance to WG3 and WG5.
Interregional transit	Metrolinx, 2041 Regional Transportation Plan (2018) and Niagara Extension / Lakeshore West GO Expansion planning (current)	Provide regional rail and station-area context, planned service connections and potential shifts in interregional travel. Relevant information may inform transportation scenarios, transit-oriented development and connections between local transit and GO service.	Primary context for WG4 and WG2.
Water and wastewater infrastructure	Niagara Region Water and Wastewater Master Servicing Plan (2021, 2026 update in progress)	Identifies existing systems, servicing strategies, growth-related infrastructure and capital projects. Flow, capacity and project information may help identify future electricity and natural gas loads and opportunities for efficiency, energy recovery, biogas or coordinated capital planning.	Primary context for WG3 and WG2.
Waste management	Niagara Region Waste Strategy - Beyond Waste: Our Vision for What's Next (2026-2051) and supporting technical documentation	Provides waste-generation trends, diversion direction, facility and processing options, disposal capacity and implementation timing. It may inform future waste-sector energy and emissions, fleet and facility needs, and landfill gas or resource-recovery opportunities.	Relevant to WG3 and WG1, with community implications for WG5.

Plan/Study Type	Document(s)	Relationship to the CEP	Relevant WGs
Regional priorities and economic context	Growing Better Together: Council Strategic Priorities 2023-2026 and relevant Regional economic development plans and sector strategies	Help align the CEP with Regional priorities for a green and resilient region, economic growth, infrastructure and community well-being. Sector information on manufacturing, agri-food, tourism and workforce needs may inform economic assumptions, action design and implementation partnerships.	Primary context for WG1, with relevance across all WGs.
Local municipal energy and climate plans	Current LAM Conservation and Demand Management Plans (generally 2024-2028), corporate and community climate plans and related facility or fleet strategies	Identify local targets, projects, municipal assets and implementation experience across Niagara's 12 municipalities. Relevant examples can inform municipal leadership actions, coordination opportunities and early implementation, without treating corporate plans as substitutes for community-wide analysis.	Relevant across WG2, WG3 and WG4.
Electricity distribution planning	Current Distribution System Plans and related capacity, distributed-energy-resource and electrification studies for the seven electricity distributors serving Niagara (planning periods vary)	Can provide local distribution-level context on capacity, planned investments, reliability, distributed generation, storage and EV or building-electrification readiness. These sources will be used selectively with direct utility input where local constraints or opportunities affect CEP actions.	Primary context for WG3, with relevance to WG4.
Comparator community energy plans	Selected community energy and climate plans from Ontario municipalities and regions (ongoing comparator review)	Provide practical examples of visions, targets, scenario structures, actions, governance and performance measures used elsewhere. Comparable practices will be	Relevant to all WGs and the Steering Committee.

Plan/Study Type	Document(s)	Relationship to the CEP	Relevant WGs
		adapted to Niagara's energy profile and engagement findings.	
Provincial energy policy	Ontario, Energy for Generations: Ontario's Integrated Plan to Power the Strongest Economy in the G7 (2025)	Provides the provincial policy context for electricity and natural gas planning, conservation, new supply, transmission, affordability, reliability and Indigenous participation. It will help frame assumptions and constraints for future energy scenarios and local energy actions.	Primary context for WG3, with relevance to WG1 and WG5.