

WILFRID LAURIER UNIVERSITY

Energy Conservation and Demand Management Plan

2025-2029

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EXECUTIVE SUMMARY

This Energy Conservation and Demand Management (ECDM) Plan is written in accordance with Ontario Regulation 507/18 under the *Electricity Act, 1998*, which mandated Broader Public Sector (BPS) energy reporting, **was revoked and replaced** by [O. Reg. 25/23 \(Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans\)](#) sections 4, 5, and 6 of the recently amended Electricity Act, 1998, O. Reg. 507/18. As concerns surrounding energy availability and cost continue to rise, an ECDM Plan is an effective way to strengthen Wilfrid Laurier University's energy management initiatives.

In conjunction with the Energy Management Working Group (EMWG) and Sustainability Office, Laurier will continue to advance its strategy by:

- ✓ Reviewing current practices to identify opportunities for improved performance and outcomes
- ✓ Enhancing energy conservation education and awareness for students, staff, and faculty
- ✓ Integrating Laurier's ECDM Plan and related data into academic programs and experiential learning opportunities
- ✓ Continuing to monitor, analyze, and optimize energy consumption across all campus facilities

Using this report, Laurier will further define its energy efficiency and greenhouse gas (GHG) reduction goals, objectives, and targets, reinforcing its commitment to environmental leadership. This ECDM Plan is an update from the previous iteration launched in 2019, and it includes:

- ✓ **Laurier's goals and objectives** for reducing and improving the efficiency of energy and water use
- ✓ **Background on Laurier's sustainability initiatives**, including progress toward greenhouse gas (GHG) emissions reduction
- ✓ **Energy consumption baseline** and an overview of progress since the 2019 ECDM Plan
- ✓ **Comprehensive overview of Laurier's greenhouse gas emissions inventory** and energy benchmarking performance
- ✓ **Summary of completed energy efficiency and water reduction projects** through the Laurier Energy Efficiency Program
- ✓ **Proposed Energy Conservation and Demand Management (ECDM) measures** for implementation from 2025 to 2029

The university recognizes that intellectual inquiry, critical reflection, and scholarly integrity are the cornerstones of all universities, including our institution. Laurier's [values, vision, and mission](#) are integral to the advancement of sustainability on all campuses.



1.0 INTRODUCTION

Wilfrid Laurier University is committed to advancing sustainability through its operations, academics, and engagement. Sustainability is woven into the fabric of our university, shaping how we teach, conduct research, and manage our campuses.

In 2023, Laurier launched the [2023-28 Sustainability Action Plan](#) (“the Plan”), which includes 12 goals to advance sustainability across all campuses. Within the Plan, two goals specifically guide energy management and climate action, providing direction for sustainable campus operations – including energy conservation initiatives:

- ✓ **GOAL 1:** Continue to reduce greenhouse gas (GHG) emissions across Laurier campuses in Brantford and Waterloo, building a low-carbon campus in Milton, and undertaking other projects as funding opportunities arise.
- ✓ **GOAL 2:** Improve energy and water conservation across campus and contribute to facilities renewal deferred maintenance.

The Plan supports the integration of proposed actions and projects identified in the ECDM Plan to achieve energy and climate-related goals. The purpose of Laurier’s ECDM Plan is to outline the university’s energy conservation goals, progress, and priority projects. Since 2019, Laurier has expanded its energy management program, accelerating progress toward reducing both energy use and emissions.

REGULATORY CONTEXT

In alignment with Laurier’s commitment to system efficiency and financial responsibility, the university’s energy management initiatives reflect the requirements of the Electricity Act, 1998, Ontario Regulation 25/23. This regulation mandates that Broader Public Sector (BPS) organizations develop and update an ECDM plan every five years. This ECDM Plan covers the period from 2025-2029. The next update will be released before July 1, 2029, to uphold Laurier’s reporting requirements.

SCOPE AND COVERAGE

The ECDM Plan applies to operations across Waterloo (includes Kitchener), Brantford, and Milton campuses. The scope includes all university-owned academic, administrative, recreation, and residence buildings. This updated plan builds upon the projects, goals, and objectives described in Laurier’s previous ECDM Plan (2019-2024).

APPROVAL AND GOVERNANCE

The 2025-2029 ECDM Plan is supported by the following Laurier parties: the Energy Management Working Group (EMWG), Sustainability Advisory Committee (SAC), and Facilities and Asset Management (FAM).

In accordance with Ontario Regulation 25-23, the Office of the Vice-President Finance and Administration at Wilfrid Laurier University hereby approves the 2025-2029 Energy Conservation Demand Management (ECDM) Plan.



2.0 GOALS AND OBJECTIVES FOR ENERGY CONSERVATION

Laurier is committed to embedding environmental sustainability across its operations, engagement activities, and academic partnerships. Since 2019, the university has strengthened its sustainability framework through policy, projects, and strategic action planning. Key advancements include the [Laurier Strategic Action Plan](#) (2024-28), [the Sustainability Action Plan](#) (2023-28), the updated [4.13 Sustainability Policy](#), and the completion of the Laurier Energy Efficiency Program (LEEP).

This updated strategic ECDM Plan addresses the interconnected issues of indoor environmental quality, energy use and facility operations. Our goal is to continuously evaluate and enhance current practices to a) maximize operational efficiency and b) ensure resources are allocated effectively to support our campus community.

LAURIER'S ENERGY AND CLIMATE GOALS

- ✓ Optimize the value, efficiency, condition, accessibility and sustainability of space university wide (**Laurier Strategic Action Plan 2024-28**)
- ✓ Improve energy and water conservation across campus and contribute to facilities renewal deferred maintenance (**Sustainability Action Plan 2023-28**)
- ✓ Continue to reduce greenhouse gas (GHG) emissions across Laurier campuses in Brantford and Waterloo, building a low-carbon campus in Milton, and undertaking other projects as funding opportunities arise (**Sustainability Action Plan 2023-28**)

OBJECTIVES

FROM SUSTAINABILITY ACTION PLAN

1. **Develop a utility metering strategy** that will include retrofit and replacement of outdated infrastructure and capacity to maximize savings.
2. **Develop building energy benchmarking capabilities and key performance indicators (KPIs).**

ADDITIONAL OBJECTIVES

3. **Improve building energy and water efficiency** through targeted upgrades, retrofits, and recommissioning.
4. **Ensure all new construction** meets high-performance, net-zero-ready design standards.
5. **Advance sustainable procurement practices** that prioritize zero carbon (or low-carbon) alternatives and the enhancement of energy performance.
6. **Foster a campus-wide culture** of energy conservation and climate mitigation.

TARGETS FOR ACHIEVING GOALS AND OBJECTIVES

AREA	TARGET
 Energy (electricity and natural gas)	❖ Maintain an Energy Use Intensity (EUI) target of less than 25 ekWh/ft² from 2025 until 2029.
 GHG Emissions (Scope 1 & 2)	❖ Reduce Scope 1 and scope 2 emissions (total) by 40% by 2030 from the baseline year (2009).
 Water	❖ Maintain a Water Use Intensity (WUI) target of less than 0.045 m³/ ft² from 2025 until 2029.
 Fleet Electrification	❖ Transition 30% of Facilities Operations fleet vehicles (based on the 2024 fleet inventory) to hybrid-electric or fully electric vehicles by 2029.



3.0 BACKGROUND ON WILFRID LAURIER UNIVERSITY

Laurier traces its roots to the opening of the Evangelical Lutheran Seminary in Waterloo more than 100 years ago in 1911. The university has gone through several changes since then, and in 1973 the name changed from Waterloo Lutheran University to Wilfrid Laurier University. In 1999, the Brantford Campus opened, and the first students were welcomed to the [Laurier Milton](#) campus in September 2024. For more background on renovations, additions, and new construction throughout the years, Laurier provides a [historical overview of Laurier facilities](#) on its website.

3.1 SUSTAINABILITY AT LAURIER

Laurier is committed to raising awareness, inspiring action, and implementing initiatives that address economic, environmental, and social challenges to create a more sustainable future.

The [Sustainability Office at Laurier](#) was brought to fruition in 2010 after a 2009 referendum as students expressed the need for a formalized office to guide sustainability efforts across campus. Operating within Facilities and Asset Management, the Sustainability Office works diligently to build connections, coordinate action, and equip students, staff, and faculty to become proactive leaders of sustainability.

- ❖ Planning and Administration
- ❖ Operations
- ❖ Engagement
- ❖ Academics

PLANNING AND ADMINISTRATION

SUSTAINABILITY ACTION PLAN

At Laurier, the primary framework guiding the university's sustainability efforts is the [2023-28 Sustainability Action Plan](#), approved by the Board of Governors in 2023. The Plan outlines 12 goals aligned with the pillars of operations, academics, and engagement as defined by the Association for the Advancement of Sustainability in Higher Education ([AASHE](#)). It also identifies actions and opportunities designed to support the achievement of these sustainability goals by 2028.

LAURIER'S ENERGY MANAGEMENT WORKING GROUP

The Energy Management Working Group aims to collectively discuss and organize energy management efforts and resource consumption reduction at Laurier campuses. All buildings and properties 100% owned or operated by Laurier are included in the scope of the Energy Management program.

The Energy Management Working Group also structures its approach to achieve efficient and effective use of energy by aligning with key elements of IESO's Strategic Energy Management program and Enbridge's ICI incentive program.

The group consists of key members of the Facilities and Asset Management group, stakeholders from faculties, departments, and services who inform energy related decisions across Laurier's campuses. This allows representation of diverse interests and knowledge sharing and ensures a collaborative and integrated approach to developing a successful Energy Management program.

STRATEGIC ENERGY MANAGEMENT PROGRAM

In 2023, the university signed on to participate in an industry cohort for the Strategic Energy Management (SEM) Program, offered by Save on Energy. The program milestones included: establishing a project register, completing an energy map, establishing an energy team, and completing an energy management assessment. At Laurier, five individuals represented the institution, meeting with the SEM representative monthly for the two-year program duration. The cohort-based approach helped build a strong focus on shared learning with other organizations participants. In September 2025, Laurier completed its two-year program term and set the stage for developing a strong, more robust energy program.

OPERATIONS

CLIMATE

In 2020, Wilfrid Laurier University developed its Carbon Reduction Roadmap (CRR), which outlined the framework for achieving net zero by 2050. The CRR emphasized the need for strategic planning and phased project implementation towards full campus decarbonization. In 2025, an update to the CRR provides two key phases: phase 1, the identification of strategic measures to achieve Laurier's 2030 GHG reduction target and decarbonize all campuses by 2050; and phase 2, the establishment of a decarbonization framework aligned with Laurier's "pathway to net zero" implemented through a net zero standard. The Net-Zero Standard incorporates key governance tools to ensure that all capital and operational decisions align with Laurier's net-zero ambition to bridge Laurier's net-zero gap, a set of defined and actionable decarbonization governance tools are required.

ENGAGEMENT

THE GREEN OFFICE PROGRAM

Laurier's Green Office (GO) Program is designed to encourage staff and faculty to get involved in sustainability initiatives on campus. A green office participant is a department that is committed to reducing its environmental footprint, embedding sustainability into decision-making, and fostering a culture of sustainability across Laurier.

Offices that sign onto the program accumulate points based on how many sustainability projects and initiatives they undertake and can achieve bronze, silver, or gold standing as they progress through the program. Part of the program focuses on energy use within units and encourages staff to seek opportunities to reduce consumption to conserve energy and contribute to reduced emissions.

SUSTAINABLE HAWK FUND

Led by the Sustainability Office, the Sustainable Hawk Fund (SHF) awards up to \$5,000 per project (\$30,000 per year total) that promotes sustainability on campus and in the community. Projects must align with at least one of Laurier's [Sustainability Action Plan](#) goals, such as waste reduction, energy and climate, sustainable food systems, campus engagement, and improving natural spaces. The fund is open to students, staff, and faculty from all campuses. Applicants may also include a business plan, creative design, goals, and project deliverables as supportive documents.

3.2 EMISSIONS PROFILE BREAKDOWN

The university utilizes a mix of energy sources, including electricity, natural gas, and renewable energy, to power Laurier's diverse facilities, which range from lecture halls and laboratories to residence buildings and recreational spaces. The university's energy use primarily stems from various building systems and unique end-use considerations based on seasonal influx of students.

The scope boundaries and activities that are included in the GHG emissions calculations for Laurier, were selected based on the availability of data and discussions with the Sustainability Office and are summarized in Table 1 below. At Laurier, the emissions inventory sources include Scope 1,2, and 3 (refer to Table 2).

Table 1. Breakdown of emissions scopes with definitions and source

Emissions Scope	Definition	Source of Emission
Scope 1	Direct emissions from sources owned or controlled by the institution	- Natural Gas - Gasoline
Scope 2	Indirect emissions from the consumption of purchased energy generated upstream from the institution	Purchased electricity
Scope 3	Indirect emissions that are outcomes from Laurier's activities.	- Upstream activities (business travel, leased assets, waste, water, capital goods) - Downstream activities (investments, franchises, end-of-life treatment for sold products)

Table 2. Breakdown of sources of emissions that are included in Laurier's emissions inventory

Emissions Scope	Source of Emission at Laurier
Scope 1	✓ Natural Gas ✓ Fleet
Scope 2	✓ Electricity
Scope 3	✓ Air Travel ✓ Water ✓ Waste

Laurier has two emissions reduction targets – 40% reduction by 2030 and net zero by 2050. The trajectory towards net zero requires intensive decarbonization efforts and investment from the 2030 interim target year (refer to Figure 1). Annually, the University reports its progress on its GHG emissions reduction targets, which can be accessed on the [Sustainability Strategy and Progress webpage](#).

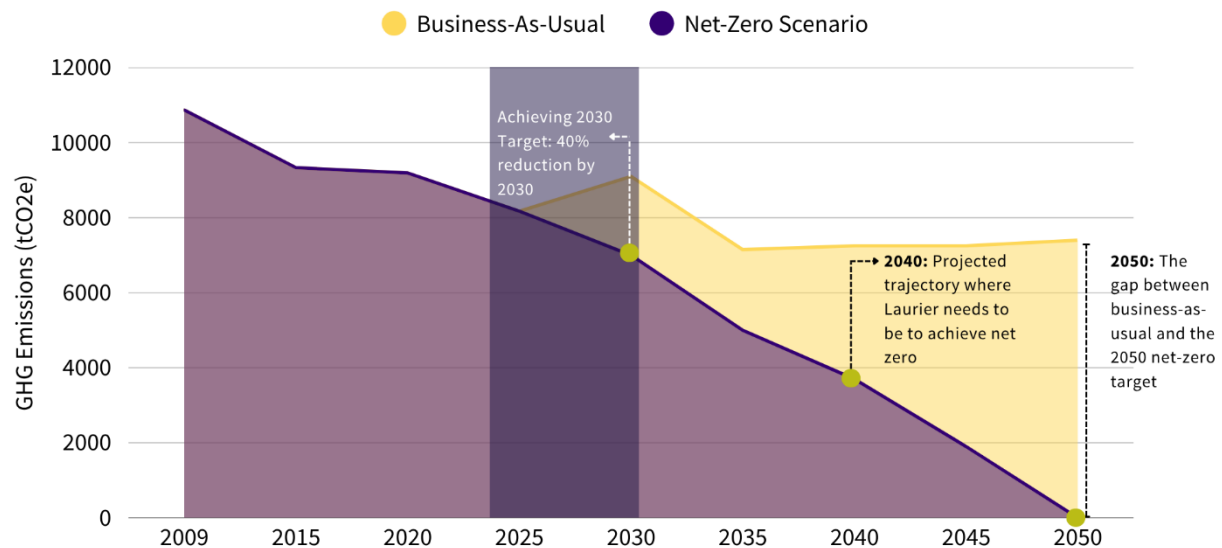
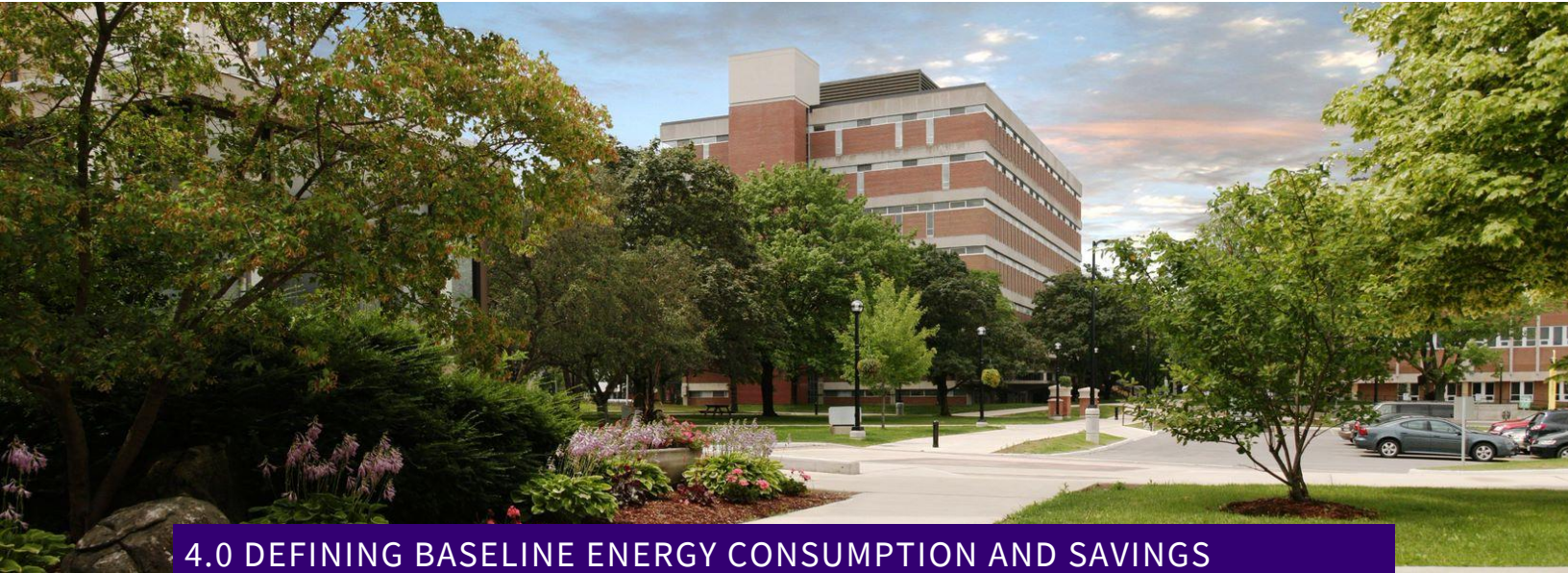


Figure 1. The commitment to net zero requires planning and collaboration to achieve all interim targets along the way. This illustration shows two scenarios - business-as-usual and net zero. The trajectory towards net zero by 2050 highlights the need the need to commit to energy retrofits and decarbonization projects.



4.0 DEFINING BASELINE ENERGY CONSUMPTION AND SAVINGS

The ECDM plan utilizes energy consumption data from 2009 as the baseline to ensure comparability across reporting cycles. By using 2009 as a baseline, the university can adequately track energy conservation measures and reduction in greenhouse gas emissions, while measuring against building acquisitions and campus expansions (see Table 3).

Table 3. Summary of electricity use, natural gas consumption, and greenhouse gas emissions from the 2009 baseline year.

Metric	Total (in 2009)
Electricity Use (kWh)	✓ 30,488,166
Natural Gas (m3) Consumption	✓ 3,808,600
GHG Emissions (2009) (electricity and natural gas)	✓ 10,859 tonnes CO2e
Renewable energy generated	✓ N/A

Since 2009, the university has expanded on the Brantford and Waterloo campuses, adding new buildings that contribute to our emissions and energy footprint. Consequently, Laurier still reduced its electricity and natural gas usage since the baseline year (see Table 4).

Table 4. Summary of electricity, natural gas, and greenhouse gas emissions reduction, in addition to renewable energy generation for 2024

Metric	Total (in 2024)
kWh Reduction	✓ 202,356 kWh
Natural Gas (m3) reduction	✓ 105,788 m3
GHG Emissions avoided (Scope 1 + 2)	✓ 3,296 tonnes CO2e
Renewable energy generated	✓ 587,653 kWh

4.1 PROGRESS SINCE PREVIOUS PLAN

Since the completion of Laurier's 2019 ECDM Plan, the university **reduced its overall natural gas consumption by 26% and its electricity consumption by 13%** (most recent update published in the 2024-25 Annual Sustainability Report), signifying improvements across energy use. In addition, there has been a reduction of GHG emissions (Scope 1 + 2) of 21.7% since the baseline (2009).

HISTORY OF THE LAURIER ENERGY EFFICIENCY PROGRAM (LEEP)

The Laurier Energy Efficiency Program (LEEP), a \$48-million multi-phase initiative, has transformed Laurier's building portfolio into a benchmark for sustainable management. From 2016 to 2022, LEEP enabled the university to expand the use of clean and renewable electricity, marking a significant milestone in Laurier's sustainability journey. There are many notable successes from the program listed below.

LEEP'S SUCCESSES

- Installation of two solar walls at the Waterloo campus' library and Bricker residence, which have effectively reduced energy consumption during the heating season.
- Approximately 25,000 lamps/lighting fixtures were replaced with LED lights.
- More than 1,500 solar panels were installed on seven buildings on the Waterloo and Brantford campuses, generating enough clean electricity each month to power approximately 820 laptops.
 - Approximately 550 kW DC renewable solar power
 - Total number of solar panels is around 1,550; capacity in KW DC is 550, kWh production is ~798,460
- In 2020, a generator building installation was completed, in addition to the Battery Energy Storage System (BESS). Going forward Laurier's microgrid, when necessary, will have the flexibility to produce power via generation or by dispatching power from the BESS.
 - 2MW/4MWh BESS capability for peak shaving / demand response
 - Increase grid resiliency by "islanding" main campus during extended power outages
 - Batteries are broken down into racks; 12 racks x 2 containers

PROJECTS COMPLETED SINCE 2019 ECDM

The 2019-2024 ECDM Plan included an energy analysis that identified several conservation strategies for Laurier's facilities. The Plan outlined 32 projects in total; three were completed, four were in progress, and the remaining were not completed. While comprehensive, the list primarily reflected ideal long-term opportunities that lacked dedicated funding or completed feasibility studies. As the LEEP program advanced, project priorities shifted toward implementing energy initiatives related to electrical systems, water conservation, HVAC upgrades, and building-envelope improvements.

In February 2017, LEEP Phase 2 was initiated to build upon the energy conservation measures (ECM) identified during Phase 1. The scope of Phase 2 expanded to include most buildings on both the Waterloo and Brantford campuses. Completed measures under Phase 2 included: lighting retrofits, lighting controls, submetering, demand control ventilation, occupancy controls/scheduling, and weather stripping/envelope improvements (refer to Table 5 for a summary).

LEEP Project List (Up to 2022)

Table 5. Summary of ECM measures implemented in each building during LEEP Phase 2

Phase Two ECMs	Electrical			Water	HVAC		Envelope
Building Name	Lighting Retrofits	Lighting Controls	Sub-meters	Low Flow Fixtures	Demand Control Ventilation	Occupancy Controls	Weather Stripping or Envelope Changes
Arts Building “A” Wing	X	X		X	X	X	X
Dr. Alvin Woods Buildings	X			X		X	X
Fred Nichols Campus Centre	X	X		X		X	X
Dining Hall	X			X			X
Student Services Building	X			X			
Library	X						X
Theatre Auditorium	X			X			X
Athletic Complex	X			X		X	X
Alumni Hall	X			X			X
Clara Conrad Residence	X			X			X
Schlegel Centre	X	X		X			
Bouckaert Hall Residence	X			X			X
John Aird Building	X			X		X	X
202 Regina St	X			X		X	X
Science Building	X	X		X		X	X
Science Research	X			X			X
Bricker Academic	X			X		X	X
Bricker Residence							X
University Stadium	X			X			X
81 Lodge St	X		X	X			X
King St Residence	X			X			X
Career & Co-op	X			X		X	X
Waterloo College Hall Residence	X			X			X
Outdoors	X						
Lyle S. Hallman	X			X			
Post House Residence	X		X	X			
Odeon Theatre	X		X	X			
Carnegie Building	X		X	X		X	
Brantford Student Centre	X		X	X			
67 Darling St	X			X			
SC Johnson	X		X	X		X	
97 Dalhousie St	X		X	X		X	
RAC West	X		X			X	
RAC East	X		X			X	

Additional Operational Projects Completed (2023-2025)

Science Research Mechanical Heat Loads for Laboratory Fume Hoods (2024) Focused on optimizing heat loads to improve energy efficiency in research labs.	Science Research Air Handling Unit Replacement (2024) Replaced outdated air handling units to enhance energy use and efficiency in the Science Research building.	Replacement of the Commercial Dishwasher for the Dining Hall (2024) Replaced the old commercial dishwasher with an energy efficient model, resulting in lower energy and water usage.
Installation of Air Conditioning Unit for Animal Care Laboratory (2024) Installed an air conditioning unit in the animal care lab to improve energy efficiency while maintaining optimal conditions.	Installation of Three Heat Pumps in Post House (2024) A multi-year strategy to install heat pumps that reduce energy consumption and improve heating and cooling efficiency.	Cold Regions Research Centre Operational Footprint Changes (2024) Implemented operational changes in line with sustainability goals, aiming for reduced energy and water consumption and resource use as part of the Green Lab certification process.
Post House Heat Pump Improvements (2025) Transition from gas-led heating to high-efficiency heat pump technology at Post House (addition of 11 heat pumps and removal of 13 gas furnaces).	Heat Pumps at the Northdale Campus (2025) Removal of legacy heating system and replacement with current heat pump technology at the Northdale campus.	Updates to Chiller Units in the Fred Nichols Campus Centre (2025) Installation of a new chiller unit with higher water and operational efficiency than previous models in the Fred Nichols Campus Centre.
Improving Building-Automation Systems (2025) Optimization of building performance monitored through the building-automation system across Laurier campuses.	Insulated Roof in the Arts C Wing (2025) Installation of a high R-value roof to improve thermal resistance and reduce heat loss in the Arts C Wing.	Replacement of Aging Air-Conditioning Units (2025) Replacement of aging air-conditioning units with newer, high-efficient models at Waterloo College Hall and King Street Residence.

LESSONS LEARNED

Since the previous ECDM Plan, several key lessons have emerged to inform future project delivery, planning, and decision-making, including those identified by the Facilities and Asset Management team.

1. OPERATIONAL OPPORTUNITIES AND INTEGRATION OF ADVANCED CONTROLS

When equipment renewals are required, it is critical to integrate energy-efficient technologies. For instance, the demand control ventilation (DCV) upgrades in the Science Research building highlighted clear opportunities to embed similar strategies in other buildings – such as Schlegel – as equipment requires replacement. This project reinforced the importance of being proactive with capital renewal projects by putting ECDM objectives at the forefront of project planning.

2. FUNDING CHALLENGES AND PRIORITIZATION OF MODERN TECHNOLOGY

A significant barrier to implementing energy conservation measures are the financial constraints. Reflecting on past projects, limited funding is available for enhanced efficiency measures – particularly projects that don't have savings that are realized in the short-term or easily quantified. When equipment needs to be replaced, the energy efficient options are prioritized; however, for equipment that meets higher standards (i.e. net zero) the operations budget cannot always provide additional funding to projects outside of standard replacements.

This challenge has emphasized the need to explore alternative funding opportunities to support modern and efficient technology integration. An opportunity that would address the funding gap, could be the development of a revolving energy fund. Specifically, savings generated from completed efficiency projects are reinvested into future initiatives. This structure could help overcome upfront financial hurdles while advancing the institution's long-term sustainability goals.

3. PROCUREMENT GUIDELINES AND BEST PRACTICES

An ongoing challenge for acquiring new equipment or services is existing procurement processes. Often, the most cost-effective option is selected, which does not always result in the best-value outcomes. This leads to inconsistency in performance, quality, and reliability. When solely relying on cost for equipment or contractors this can lead to shortcomings in system integration, long-term performance, and functionality. Past experiences with a lowest-cost procurement approach have emphasized the importance of incorporating ECDM criteria into decision-making. Looking ahead, strengthening collaboration with procurement teams and improving clarity around purchasing will help reduce performance issues while embedding ECDM priorities.



5.0 ENERGY USE AND BENCHMARKING PERFORMANCE

The section provides a summary of the following:

- Laurier's annual energy consumption (2018-2024) for the Brantford and Waterloo campuses
- Building performance and benchmarking
- Greenhouse gas emissions inventory
- Progress tracking tools for managing energy consumption

5.1 ENERGY CONSUMPTION

Between 2018 and 2024, the university implemented a series of strategic ECMs, including LEEP. These efforts contributed to reductions in energy consumption and strengthened the overall sustainability performance of Laurier campuses. Energy usage decreased notably in 2020 and 2021 due to reduced on-campus activity during COVID-19 work from home requirements, before rebounding in 2022. Despite this fluctuation, total energy consumption in 2024 for both the Waterloo and Brantford remained below pre-2018 levels.

ENERGY USE - WATERLOO

Facility Information	
Facility Name	Wilfrid Laurier University – Kitchener-Waterloo Campuses
Address	75 University Ave W., Waterloo, ON
Gross Area (Sq. Ft)	3,159,557
Average Operational Hours Per Week	168

Of Laurier's ~24,800 graduate and undergraduate students, ~20,000 are enrolled at the Waterloo campus (2024). Laurier is a leading force in research among Canadian universities, and many of our research centres and institutes are housed here. Approximately, 1,000 undergrad and graduate students are based in the heart of the downtown area, and minutes away from Laurier's Waterloo campus.

Utilities serving the site include electricity, natural gas, and water. Since 2018, the energy use has fluctuated in response to varying levels of campus activity and remote work and learning. Despite these variations, overall consumption has shown a steady decline compared to 2018 levels (refer to Figure 2).

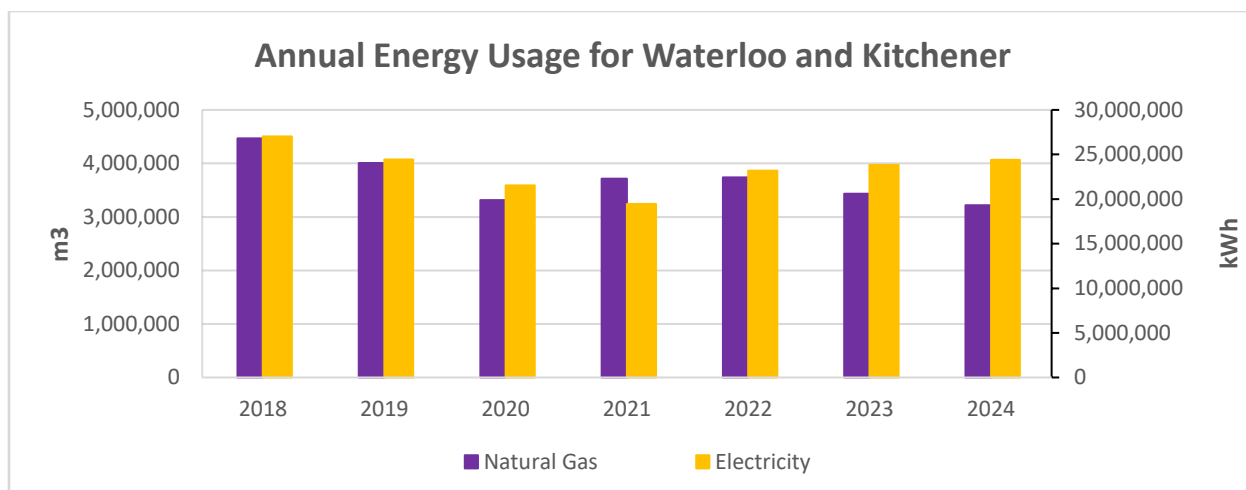


Figure 2 Summary of the annual energy use for electricity and natural gas on the Waterloo and Kitchener campuses (combined)

ENERGY USE - BRANTFORD

Facility Information	
Facility Name	Wilfrid Laurier University – Brantford Campus
Address	73 George St, Brantford, ON
Gross Area (Sq. Ft)	870,000
Average Operational Hours Per Week	168

The Brantford campus has transformed the downtown core of the City of Brantford into a thriving student community, home to over 2,500 undergraduate and graduate students. With its 19 buildings spread throughout the core of the city; the Brantford Campus is literally interwoven into the downtown area. The strong connections between campus and community don't end there, the close-knit campus experience Laurier is known for is achieved through community partnerships and opportunities for students. A healthy arts and culture scene, world-class trails system for walking and biking, and a strong slate of festivals and events make Brantford a vibrant place to call home for residents and students alike.

Utilities to the site are electricity and natural gas. In comparison to the Waterloo campus, there have been fluctuations in energy consumption in Brantford. Considering the addition of buildings added to Laurier's real estate portfolio, the campus has still seen a moderate decline in energy consumption (electricity and natural gas) from 2018 levels (refer to Figure 3).

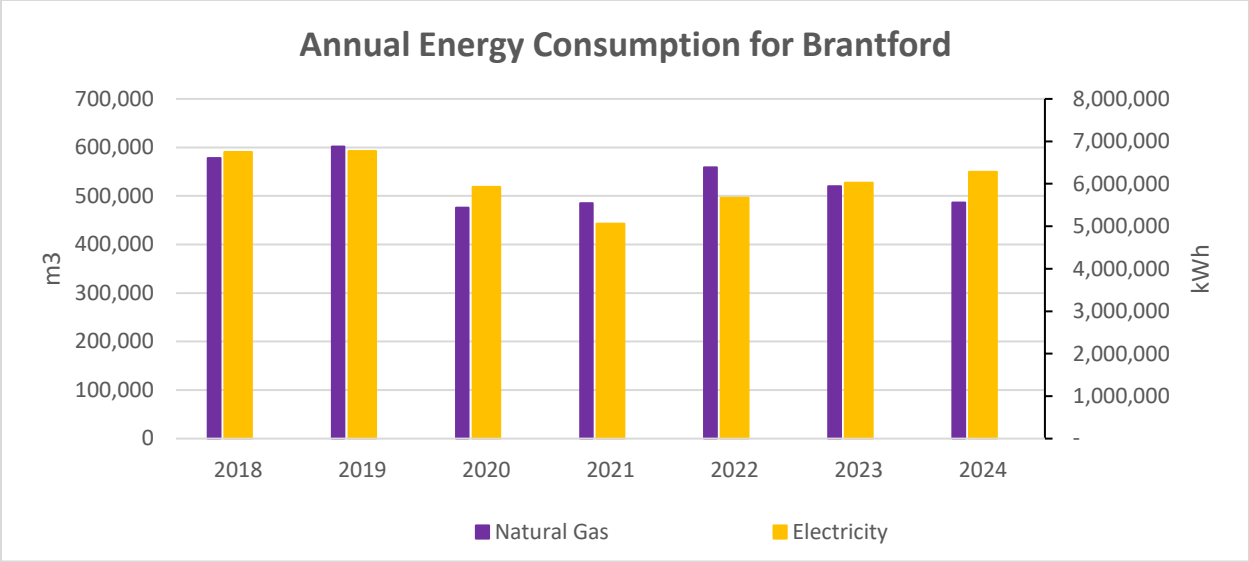


Figure 3. Summary of the annual energy use for electricity and natural gas on the Brantford campus.

5.2 BUILDING ENERGY PERFORMANCE AND BENCHMARKING

Between 2009 and 2024, Laurier campuses demonstrated mixed energy performance trends but remained below the national energy use intensity (EUI) benchmarks. Brantford campus site’s EUI increased by 4.8%, likely due to higher occupancy or equipment loads. Kitchener and Waterloo campuses EUI decreased by 68% and 23% respectively. This reflects strong efficiency gains through energy conservation measures, system upgrades and demand control strategies. Continued optimization in Brantford, will help support further reductions and support Laurier’s leadership in energy efficiency.

Table 6 Summary of benchmarking data based on the national median. Data provided is EUI (energy use intensity), which is energy per square foot per year.

Property Name	2009 Site EUI (ekWh/ft²)	2024 Site EUI (ekWh/ft²)	2024 National Median Site EUI (ekWh/ft²)	% Change between 2009 and 2024
Brantford Campus	12.6	13.2	33	4.8%
Kitchener Campus	35	11	32	-67.6%
Waterloo Campus	33	26	32	-22.7%
Total	80	50	98	-37.7%

5.3 GHG EMISSIONS INVENTORY

Over the past five years, Laurier has strategically invested in energy efficiency projects and initiatives to reduce consumption and greenhouse gas (GHG) emissions. Reporting Scope 1 (direct emissions, owned or controlled by the university), Scope 2 (indirect emissions from electricity) and Scope 3 emissions (indirect emissions from Laurier's activities), provides insight into the university's emissions reduction progress. Notably, there has been a 24.8% decrease in Scope 1 and 2 emissions collectively since the 2009 baseline (see Figure 4). Additionally, in 2024, all scopes of emissions amounted to a 6% decrease in emissions from 2023 levels. Overall, the university has seen considerable emissions reductions, particularly in Scope 1 and 2 emissions, ensuring we remain on the pathway to net-zero by 2050.

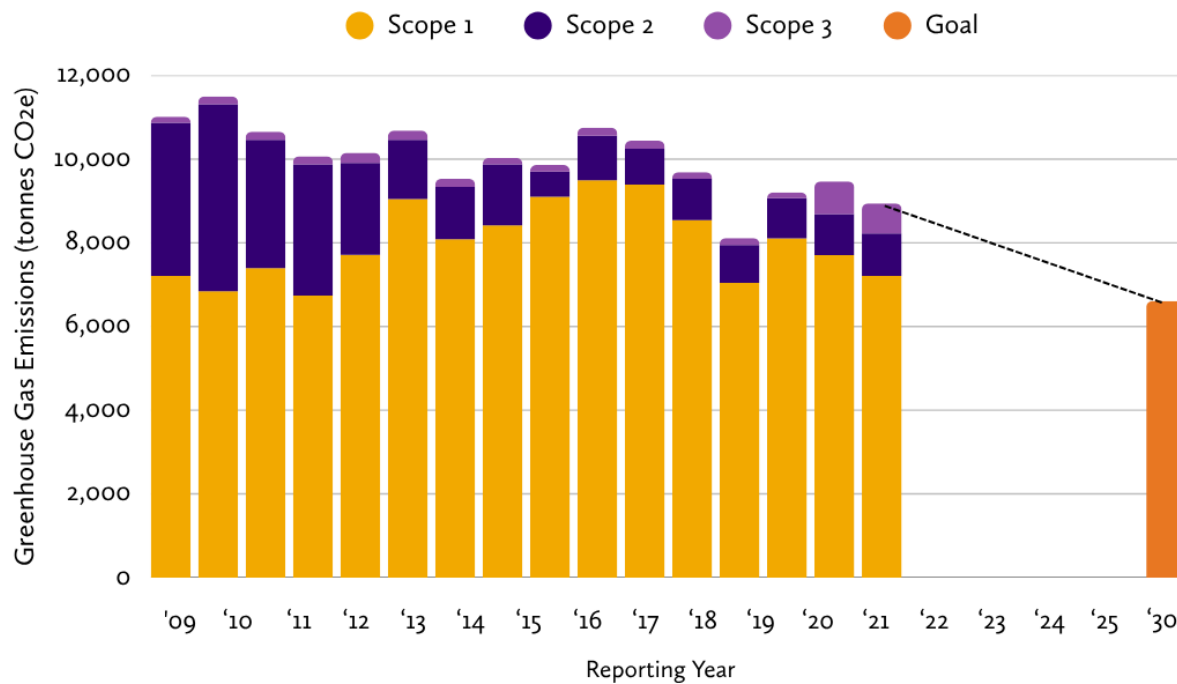


Figure 4 Total emissions for all Laurier campuses since 2009 broken down by the main sources of emissions (Scope 1, natural gas; Scope 2, electricity; and Scope 3, water, waste, and air travel).

5.4 PROGRESS TRACKING

To track energy conservation measures, the Facilities and Asset Management team uses the following tools:

- **Excel** – A widely used platform for organizing, analyzing, and visualizing both current and historical energy and cost data. Excel is frequently used for audits and for consolidating information from multiple sources.
 - **RETScreen** – A clean energy management software system developed by Natural Resources Canada. It supports feasibility analysis and campus-wide performance monitoring. The most recent version includes a net-zero planning module, which Laurier plans to integrate into its energy portfolio.
 - **Building Automation Systems (Siemens)** – An integrated controls system used to manage HVAC, lighting, and other building operations. It allows real-time monitoring and schedule adjustments to optimize energy and cost efficiency. The system primarily tracks natural gas use, with some electrical monitoring.
- Power Monitoring Expert (Schneider Electric)** – An energy monitoring platform that provides detailed electrical data and limited natural gas information. It is used to track load profiles, verify operational and equipment changes, and identify energy anomalies on the Waterloo campus.
- **Energy Star Portfolio Manager** – A benchmarking tool for tracking building energy performance. It is used primarily to support annual reporting requirements for Broader Public Sector.



6.0 PROPOSED ECDM MEASURES

The following ECDM measures outline projects under consideration for implementation between 2025 and 2029. These measures represent strategic investments intended to reduce electricity and natural gas consumption across Laurier's facilities. Notably, the implementation of these measures is not confirmed and will depend on availability of funding, detailed planning, and the feasibility of emerging technologies. This list of potential measures was informed by the Carbon Reduction Roadmap's (2025 update) project recommendations. Taken together, the proposed measures list (see Table 7) demonstrates Laurier's commitment to improving energy performance and identifying a cost-effective pathway toward long-term sustainability.

6.1 PROPOSED MEASURES (2025-2029)

The proposed projects list was developed in consultation with the Energy Management Working Group (see Table 7). Each project includes an associated building, impacted utility, and estimated annual savings. As additional funding becomes available over the duration of this ECDM Plan, the intention is to expand this list of strategic investments to further enhance energy efficiency and overall building performance.

Table 7 The breakdown of proposed energy conservation demand management projects that Laurier could take on from 2025-2029.

Building	Measure	Impacted Utility	Estimated Annual Savings	
			kWh	m3
Library	Building envelope infiltration remediation	<i>Electricity & Natural Gas</i>	2,595	8,731
	Penthouse AHUs active heat recovery	<i>Natural Gas</i>	-	26,313
Frank Peters	Cooling tower heat recovery with central HRC	<i>Natural Gas</i>	-	8,982
Arts	Upgrade remaining old roof sections	<i>Electricity & Natural Gas</i>	628	2,450
Science/Science Research/Bricker Academic	Demand control ventilation	<i>Electricity & Natural Gas</i>	52,096	10,088
Career and Co-op Centre	ASHP to replace one natural gas fired boiler	<i>Electricity & Natural Gas</i>	105,270	22,840
Cold Regions	Implement demand-control ventilation in labs and install VFD	<i>Electricity & Natural Gas</i>	7,711	8,349

6.2 RENEWABLE ENERGY AND LOW-CARBON SYSTEMS

Laurier's microgrid has the flexibility to generate power on demand or dispatch stored energy from the Battery Energy Storage System (BESS). By using the micro-grid to control both the BESS and power generator, Laurier can participate in provincial demand response programs, effectively eliminating the Waterloo campus' Global Adjustment cost, which typically account for approximately 75% of the university's electricity bill charges.

Since 2016, significant investments in rooftop photo-voltaic solar arrays (see Table 8) and energy saving capital improvement measures, such as lighting retrofits and HVAC equipment renewal, have markedly reduced campus energy demands. These investments have resulted in a reduced design load for the micro-grid system and reduced campus operational costs and GHG emissions. Because the natural gas generator is used for curtailing electrical demand during coincident provincial peaks – known as “peak shaving” – it was essential to offset any associated GHG with parallel investment in energy conservation and renewable sources of energy. Using a third-party, AI-driven peak prediction software, the generator is expected to operate fewer than 16 times per year, supporting the university's net emissions reduction goal. The BESS, and generator along with the micro-grid went online in the September 2021.

Table 8. Summary of solar-power generation on Brantford and Waterloo campus buildings for fiscal year 2023/24 (May 2023 – April 2024)

Property Name	Address	Annual System Generation (kWh)
Athletic Complex	75 University Ave W, Waterloo, ON	141,423
Clara Conrad	75 University Ave W, Waterloo, ON	161,866
Grand River Hall	171 Colborne St, Brantford, ON	39,800
Lazaridis Hall	64 University Ave W, Waterloo, ON	118,142
Library	75 University Ave W, Waterloo, ON	37,080
Peters	75 University Ave W, Waterloo, ON	53,235
Science	75 University Ave W, Waterloo, ON	36,107
TOTAL:		587,653

6.3 FORECAST OF EXPECTED RESULTS

By implementing the energy conservation measures under 6.1 Proposed Measures, campus-wide electricity and natural gas usage can be forecasted based on the utility savings associated with each individual measure. The projected university-wide utility consumption figures are summarized in Table 9 on the following page.

ENERGY REDUCTION AND FINANCIAL FORECAST

The university anticipates relatively stable electricity and natural gas consumption from 2025 to 2029, characterized by a structural shift in the campus energy profile driven by targeted decarbonization efforts. Electricity use is projected to trend upwards by approximately 1%, while natural gas may fluctuate and is

expected to decrease by 0.3% year over year. These trends reflect the ongoing impact of energy conservation measures and demand control strategies.

Natural gas use is forecasted to decline steadily from 2026 onward (refer to Table 9). Overall, energy consumption trends are illustrating a gradual increase in electricity usage and a corresponding reduction for natural gas (refer to Figure 5). This demonstrates the impact of Laurier gradually trading fossil fuel reliance for high-efficiency, low-carbon electrification.

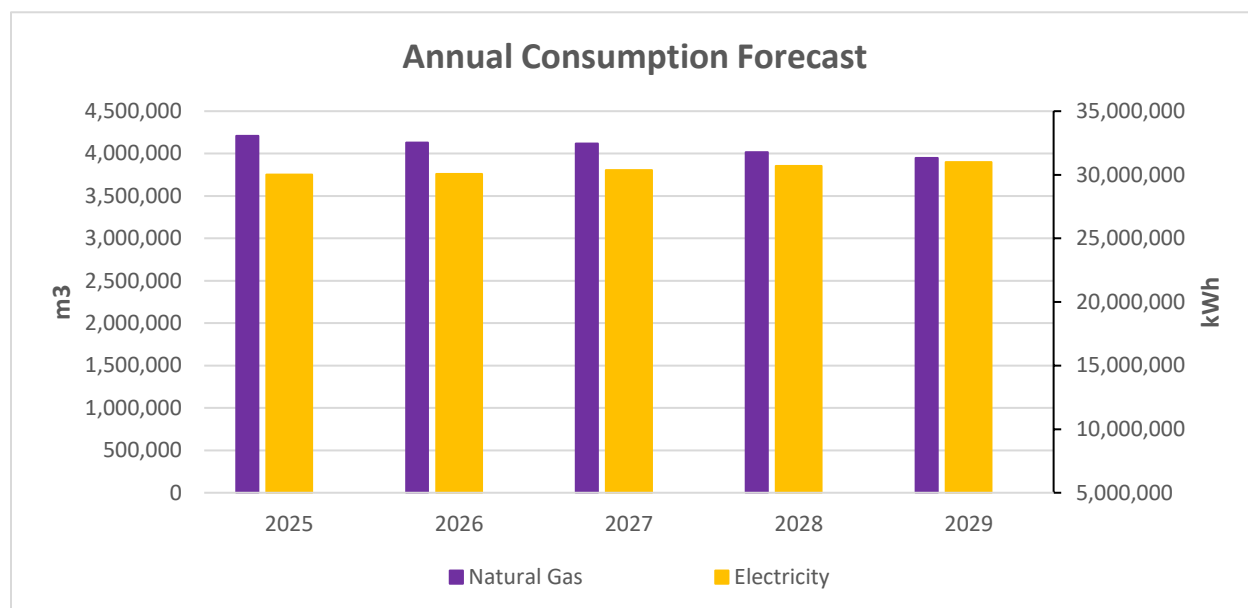


Figure 5 Graph highlighting the annual consumption forecast for natural gas and electricity, which is expected to decrease for natural gas and remain static for electricity by 2029

Table 9 Summary of the annual consumption forecast for electricity and natural gas

Annual Consumption Forecast				
Year	Electricity (kWh)	% change (year over year)	Natural Gas (m3)	% change (year over year)
2025	30,017,754.45	N/A	4,208,719.00	N/A
2026	30,059,994.45	+0.14%	4,131,006.00	-1.8%
2027	30,372,618.39	+1.04%	4,118,612.98	-0.3%
2028	30,688,493.62	+1.04%	4,016,624.70	-2.5%
2029	31,007,653.95	+1.04%	3,948,896.16	-1.7%

GHG REDUCTION FORECAST

The greenhouse gas emissions forecast is based on Laurier’s projected energy consumption and the anticipated emissions factors for both electricity and natural gas. Under the business-as-usual scenario, Laurier’s electricity emissions are expected to increase between 2025 and 2029 (refer to Table 10). This trend reflects the forecasted increase in emissions intensity of the Ontario power-grid before it begins to decline again in 2030. Natural gas related emissions are more difficult to predict, as they are strongly influenced by operational stability, weather conditions and equipment performance.

Table 10 Summary of the annual emissions forecast for electricity and natural gas

Annual Emissions Forecast (CO ₂ e)										
Utility	2025		2026		2027		2028		2029	
	CO ₂ e	% Change	CO ₂ e	% Change	CO ₂ e	% Change	CO ₂ e	% Change	CO ₂ e	% Change
Electricity (kWh)	1,151	-1.28%	1,153	0.13%	1,160	0.64%	1,159	-0.07%	1,163	0.33%
Natural Gas (m ³)	7,251	1.36%	7,355	1.16%	7,225	-1.50%	7,241	0.23%	7,231	-0.14%



7.0 OTHER CONSIDERATIONS

In addition to the specific goals, objectives, and project measures outlined in this plan, several broader considerations will influence the ongoing success of Laurier's energy conservation and demand management efforts.

7.1 MONITORING, REPORTING, AND CONTINUOUS IMPROVEMENT

Laurier commits to maintaining a data-driven, cost-effective, and transparent approach to energy management. Regular monitoring and reporting are integral to the university meeting its short-term and long-term energy and climate targets. By reporting on progress, the university ensures it complies with all regulatory requirements under the Ontario Regulation 25/23.

ANNUAL REPORTING

The university releases an annual sustainability report outlining progress on climate, energy, and water measures. Utilizing billing data and completed ECM projects, the report illustrates progress on achieving energy goals, targets, and objectives.

INTERNAL PERFORMANCE TRACKING

Currently, the university uses various tools to manage energy demand and conservation measures, as described in section 5.4 Progress Tracking. The energy management team is committed to enhancing its tracking of key performance indicators (KPIs) through a public dashboard. The Facilities and Asset Management, Sustainability Office, and ICT teams will review performance data and find a suitable option for showcasing such progress.



8.0 CLOSING COMMENTS

Thank you to all who contributed to Wilfrid Laurier University's Energy Conservation and Demand Management Plan. We consider our facility a primary source of education, and an integral part of the local community. The key to this relationship is being able to use our facilities efficiently and effectively to maximize our ability to provide the highest quality education services while integrating environmental stewardship into all aspects of facility operations.

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