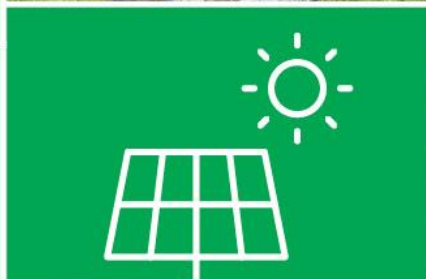




# ENERGY CONSERVATION MANAGEMENT PLAN

2024 - 2029



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## 1. Introduction

Ontario Regulation 25/23 of the Electricity Act (1998) requires municipalities to publish an energy management plan every five years to report their goals and objectives for conserving and reducing energy consumption and managing their demand for energy.

Energy management involves an interactive process of conserving, controlling, and monitoring, energy in the County. Energy management encompasses a range of practices and policies to optimize energy use, reduce costs, and minimize environmental impact. Successful management of energy involves a comprehensive approach that integrates energy efficiency programmes and behaviours into common practice.

County of Wellington's Energy Management Plan is a long-term effort that involves continuous commitment and adaptation. The County sustains their effort through an engaged energy team, effective energy management tools, and energy efficiency programmes to reduce energy consumption and greenhouse gas emission.

This document, an update of the County of Wellington's 2019 Energy Management Plan, has been developed to support, focus, communicate and celebrate the County's energy conservation efforts. This plan has been approved by County of Wellington senior management per the requirements under O. Reg 25/23.

### Plan Requirements and Scope

Ontario Regulation 25/23 requires each municipality to publish on its website and intranet site their energy conservation and demand management plans, including:

- Annual report of energy use and greenhouse gas emission for operations, and a description of previous, current, and proposed measures for conserving and otherwise reducing energy consumption and managing the County's demand for energy, including an estimate of the expected results of current and planned projects.

### Buildings Reported Under This Plan

The plan covers only buildings that are heated and owned by the County. The County owns and operates several types of facilities including administration buildings, libraries, museum and archives, long-term care facility, road services garages, waste management landfill and transfer stations, daycares, tree nursery, and social housing.

The County owns different types of social housing buildings including seniors' apartments, family apartments, townhouses, and detached houses. For this plan, only the larger multi-residential units have been included. The plan does not include single family and semi-detached units due to privacy concerns.

The County operates several traffic and streetlights, which has been included in this plan as it is a significant consumer of electricity at the County.

Table 1 shows an overview of the types of facilities, number of the buildings and the area of the buildings covered under the plan. A full list of the County’s facilities included in the plan can be found in Appendix A.

**Table 1:** Number of Buildings by Category Included in The Plan

General Facility Type	Number of County Facilities	Area Sq.ft <sup>2</sup>
Retirement/Nursing Homes	1	150,000
Administrative Offices	12	189,876
Public Services - Public Libraries	13	106,263
Other public services – Road Services Garages	9	90,135
Other public services - Landfills and Transfer Stations	6	8,730
Other public services – other - Tree Nursery.	1	14,400
Community Housing	35	994,194
OPP/Police Stations	3	46,600
Daycare Facilities	3	23,610
Culture Facility - Museum and Archives	1	72,400
Social - Meeting Hall - Community Centre	1	10,000
Street Lighting	N/A	N/A
<b>Total</b>	<b>85</b>	<b>1,706,208</b>

## **2. Our Energy Commitment**

### **Declaration of Commitment**

At the County of Wellington, we are dedicated to a sustainable and energy efficient future. Under this Energy Management Plan, our mission is to reduce our environmental impact associated with corporate energy and enhance operational efficiency at the County's buildings. The County of Wellington commits to provide the appropriate internal resources to deliver a strategic energy management plan and reduce our energy consumption and related environmental impacts.

### **Our Vision**

The County of Wellington's vision is:

- Advocate for sustainable and efficient energy by continually reducing our energy consumption and related environmental impacts.
- Strengthen our energy team's skills, participate on comprehensive energy efficient programs, and increase awareness of innovative green equipment to reduce energy consumption and greenhouse gas emissions.

### **Our Goals**

The County's goals are to:

- Improve the energy efficiency of our facilities to reduce operating costs, energy consumption and greenhouse gas emissions.
- Provide our facility managers with training and equipment required to reduce energy consumption in the facilities they manage.
- Provide building operators with data and information of their buildings' energy performance.
- Benchmark and establish a baseline energy demand of the County's buildings.
- Replace fuel combustion equipment with more sustainable and efficient equipment, where feasible.
- Expand our renewable energy production portfolio.
- Ensure our renovations and new construction embody best practices of energy efficient design.

### **Our Objectives**

Our objectives are to improve energy efficiency and reduce energy consumption in general and reduce greenhouse gas emission through:

#### **Identification of new opportunities of energy saving:**

- Benchmarking using Energy Star Portfolio Manager and RETScreen to determine opportunities for conservation in the County's buildings.

- Conduct building energy audits (ASHRAE Level 2 or better).
- Conduct feasibility studies toward net-zero emissions.

**Management and maintenance of existing systems:**

- Re-commission Building Automation Systems.
- Provide operations and maintenance teams with best practices to maintain and maximize energy efficiency and reduce energy waste.
- Implement an energy monitoring and targeting (M&T) system to monitor consumption as an integral component of our information management system.
- Adopt standard methods for savings verification, a measurement and verification (M&V) plan and incorporate into all energy projects.

**Leverage our energy team's skills and create a culture of conservation:**

- Strengthen awareness of the impact of energy conservation on climate change and greenhouse gas emissions.
- Increase awareness of new efficient equipment and carbon cost.
- Participate in employee training and staff awareness programmes.

**Upgrade our existing buildings and equipment:**

- Building envelopes
- Equipment and building system controls.

**Our Energy Conservation Targets**

The County has a target to reduce the energy consumption by 10% by 2029, compared to 2023. According to the County's proposed energy projects, the County can reduce electricity consumption by 8% (1,253 MWh), natural gas consumption by 11% (237,878 m<sup>3</sup>), and greenhouse gas emissions by 11% (454 tCO<sub>2</sub>e) by 2029 (a 5-year period) compared to 2023, for facilities reported under Ontario Regulation 25/23. With a prominent focus on energy management, and after implementing the proposed energy projects without any unexpected changes, County of Wellington can achieve the following targets by 2029:

- 8% reduction in electricity consumption (1,252,808 kWh).
- 11% reduction in natural gas consumption (237,878 m<sup>3</sup>).
- 454 tCO<sub>2</sub>e reduction of greenhouse gas emissions.

### **3. Organizational Understanding**

The maturity of an organization is assessed by the collective demonstration of understanding of the work that needs to be completed and the tools and resources in place to address those needs. Below is a summary of the County's understanding of energy efficiency work and resources needed to meet the targets noted above.

#### **County Needs**

In order to achieve the target to reduce energy consumption and greenhouse gas emissions, the County of Wellington needs energy efficient systems at the County's facilities, sustainable and green energy sources, and low-energy consuming technology.

#### **Stakeholder Needs**

The County's internal stakeholders (Council, Committees of Council, CAO, and staff) need:

- Reports and information to maintain awareness of the County's energy consumption and greenhouse gas emissions,
- annual progress report of the County's commitment to the plan,
- training and support to increase knowledge of energy management best practices, and
- updated energy management plan with clear goals and targets to communicate the corporate commitment to energy efficiency.

External stakeholders (Province, County citizens, community groups) expect the County to be accountable for energy efficiency and minimize the energy consumption and greenhouse gas emissions of the County's buildings.

#### **The Energy Management Team**

The monitoring of our energy consumption and the energy performance of our facilities and equipment are the responsibilities of Climate Change and Sustainability Division. The County's buildings are divided between several facility managers. Together with the County's Finance, Asset Management, and Purchasing teams, these staff work to achieve the County goals.

#### **Climate Change Division**

Climate Change and Sustainability Division is responsible for reporting on the County's energy consumption and greenhouse gas emission. Some of the division's key responsibilities are:

- energy monitoring of County buildings,
- identify, develop, and recommend energy saving opportunities,
- maintain the Energy Management System (EMS), EnergyCap, that includes data management, retrieving and analyzing results, developing and implementing tools, and supplying information to help all County departments with decision-making and budget preparation,
- recommend energy efficiency incentive programmes,

- seek federal and provincial funds for energy efficiency projects,
- identify data anomalies and work with facility managers to determine the cause and solution, and
- provide support and guidance to other County departments with respect to energy usage and environmentally sustainable initiatives.

The Climate Change and Sustainability Division is responsible for reporting on the commitments contained within this plan and updating subsequent plans.

### **Finance Division**

The first step of energy management is accurate data and billing. The Finance team is responsible for the energy billing system, including:

- energy bill payment,
- digitizing energy consumption data from energy bills,
- energy bill retention, and
- data dissemination to other departments.

### **Asset Management Division**

Our Asset Management Division helps to track asset value and replacement schedules of each facility and equipment. One of their key responsibilities is to:

- establish consistent asset management performance measurements and a centralized asset management system.

### **Facility Managers**

Facility managers are responsible for implementing energy efficiency projects in County buildings. Some of their key responsibilities are:

- ensuring facilities are safe and efficiently operated,
- implementing energy savings opportunities,
- establishing energy performance standards for equipment used in all construction projects within the County,
- developing capital budgets for maintenance and replacement of mechanical equipment, building envelope upgrades, etc., and
- managing Building Automation Systems (BAS) to improve the performance of County facilities.

### **Purchasing and Risk Division**

One cost-effective approach to reduce energy consumption is through purchasing. The following list details the primary focus areas for the purchasing:

- **Energy purchasing** – Continue to participate in purchasing programmes to procure electricity and natural gas.

- **Procurement Policy** – Policies to support the procurement of goods and services that support the County’s energy efficiency and greenhouse gas reduction goals.

### **Energy Data Management Tools**

The County of Wellington uses energy management software (EMS) to track energy consumption and greenhouse gas emissions from County buildings. The EMS supports the County’s energy management objectives including:

- **Data storage:** Provide a safe storage system for storing and protecting facility energy consumption and costs for all energy types and greenhouse gas (GHG) emissions.
- **Quality control/assurance/validation** Automated data validation system to identify anomalies within prescribed parameters.
- **Tracking and monitoring:** Monitor facility performance and track changes over time.
- **Reporting and communications:** Generate reports with visual supports (graphs, illustrations) for use at all levels in the County to manage energy consumption and greenhouse gas emissions.

### **Plan Update and Review Process**

The Climate Change and Sustainability Division will review this plan annually by identifying completed initiatives, monitoring progress towards our energy reduction targets, and reporting the findings to senior management and stakeholders.

### **Review of Conservation and Demand Management, 2019-2023**

Properties and Maintenance staff continue to make progress on implementing actions associated with the County’s Conservation and Demand Management Plan 2019.

Of thirty-nine actions in the 2019 Conservation and Demand Management Plan, the County has addressed the following:

- 16 completed
- 9 in progress
- 3 cancelled
- 3 delayed
- 8 not yet initiated

#### 4. Energy Consumption Trends

The energy consumption of the County’s buildings reported under Ontario Regulation 25/23 includes electricity consumption and fuel consumption for heating buildings (natural gas and propane). The following table compares the total annual energy consumption and greenhouse gas emissions for County facilities, reported under Ontario Regulation 25/23, in 2017 (baseline year), 2019 (initiation of CDMP 2019), and 2023 (termination of CDMP 2019), as per the annual reports submitted to the Ministry of Energy.

Table 2 shows growth in the County’s floor area in 2019 and 2023. This growth caused an increase in energy consumption and greenhouse gas emissions in 2019 and 2023. These numbers have not been adjusted for weather or occupancy rates, both of which can be significant factors in energy usage. 2023 consumption reflected operational changes to manage air quality due to the COVID-19 pandemic. These operational changes increased the energy load for the buildings; this increase will need to be noted when comparing energy consumption before COVID-19 and after COVID-19.

**Table 2: County of Wellington Energy Consumption and Greenhouse Gas Emissions**

	2017	2019	2023
<b>Total energy (kWh)</b>	30,304,972	35,021,318	36,545,731
<b>Total GHG Emissions (tCO<sub>2</sub>e)</b>	2,968	3,696	4,043
<b>Floor Area (ft<sup>2</sup>) Square feet</b>	1,614,097	1,655,207	1,706,693
<b>Energy Consumption (kWh/ft<sup>2</sup>)</b>	18.78	21.16	21.41
<b>GHG Emissions per square foot (kg CO<sub>2</sub>e/ft<sup>2</sup>)</b>	1.84	2.23	2.37

#### Energy Consumption 2019-2023

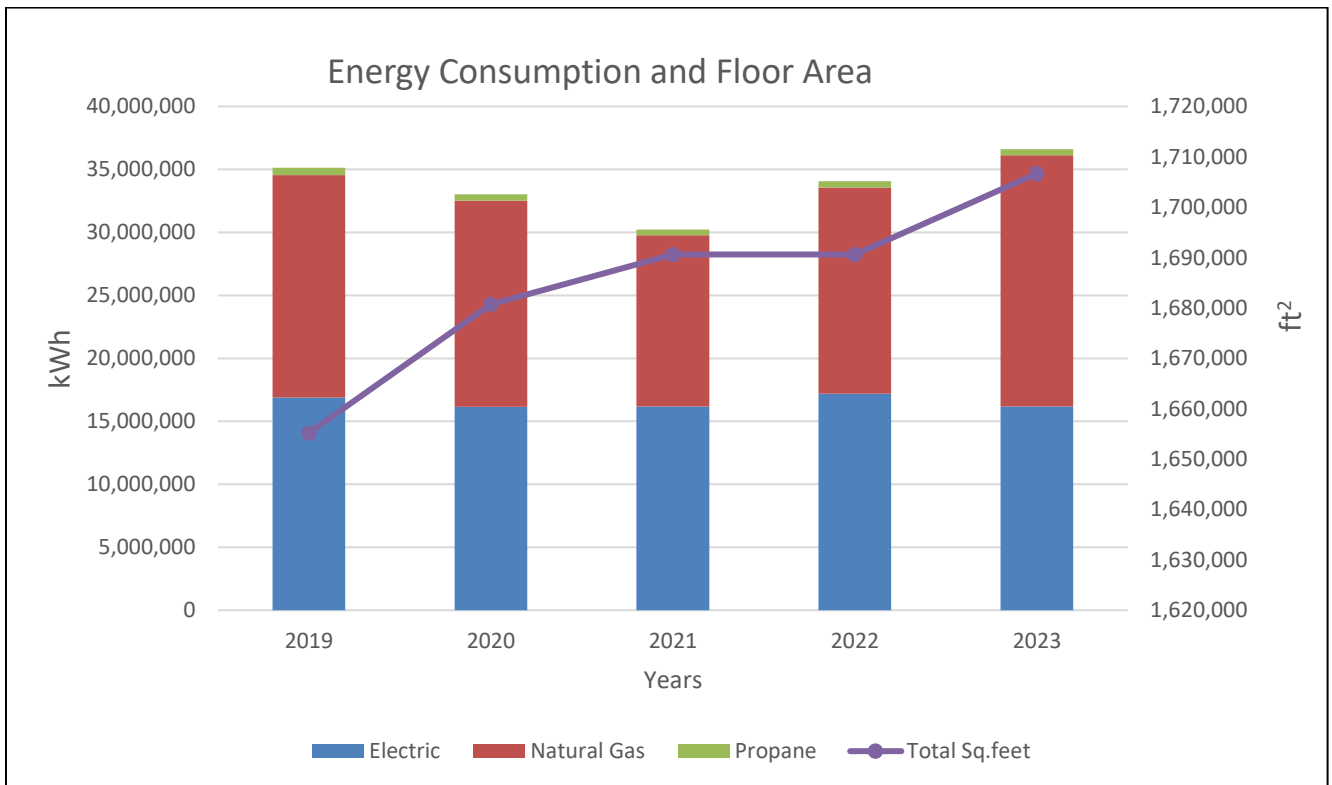
The County’s 2019 Conservation and Demand Management Plan (CDMP 2019) targeted a 3% energy reduction by 2023. The County’s 2023 floor area increased by 3% compared to 2019. As a result, the County’s 2023 total energy consumption (36,546 MWh) is 4% higher than 2019 (Table 3, and Figure 1).

Table 3 shows the change in energy consumption per commodity:

- Despite the increase in building floor area and additional filtration and ventilation run-times, electricity consumption decreased by 4.2%.
- Propane consumption decreased by 21%.
- Natural gas consumption increased by 6%.

**Table 3:** County of Wellington Energy Consumption 2019-2023

	2019	2020	2021	2022	2023
<b>Electric (kWh)</b>	16,929,561	16,196,797	16,241,111	17,243,388	16,223,186
<b>(%) Change over 2019</b>	-4.17%				
<b>Natural Gas (m<sup>3</sup>)</b>	2,004,122	1,842,781	1,477,748	1,779,578	2,133,789
<b>(%) Change over 2019</b>	6%				
<b>Propane (L)</b>	86,917	70,414	68,407	74,168	68,947
<b>(%) Change over 2019</b>	-21%				
<b>Total kWh</b>	35,021,318	33,143,437	30,333,481	34,233,796	36,545,731
<b>(%) Change over 2019</b>	4%				
<b>Total Sq. ft<sup>2</sup></b>	1,655,207	1,680,692	1,690,651	1,690,651	1,706,693
<b>(%) Change over 2019</b>	%3				
<b>kWh/ft<sup>2</sup></b>	17.0	15.9	14.5	16.4	17.4
<b>(%) Change over 2019</b>	2%				



**Figure 1:** County of Wellington Energy Consumption and Building Floor Area

The County reported energy reductions in 2020, 2021 and 2022 compared to 2019. In 2023, County reported energy increases due to the increase in building floor area and COVID-19 operational changes (Figure1).

### Greenhouse Gas Emissions 2019-2023

Most of the County’s greenhouse gas emissions from buildings comes from natural gas, approximately 90% ( Figure 2). The County uses natural gas for heating and water heating. The County reported greenhouse gas emissions reductions in 2020, 2021 and 2022 compared to 2019. In 2023, County reported greenhouse gas emissions increases due to the increase in natural gas consumption.

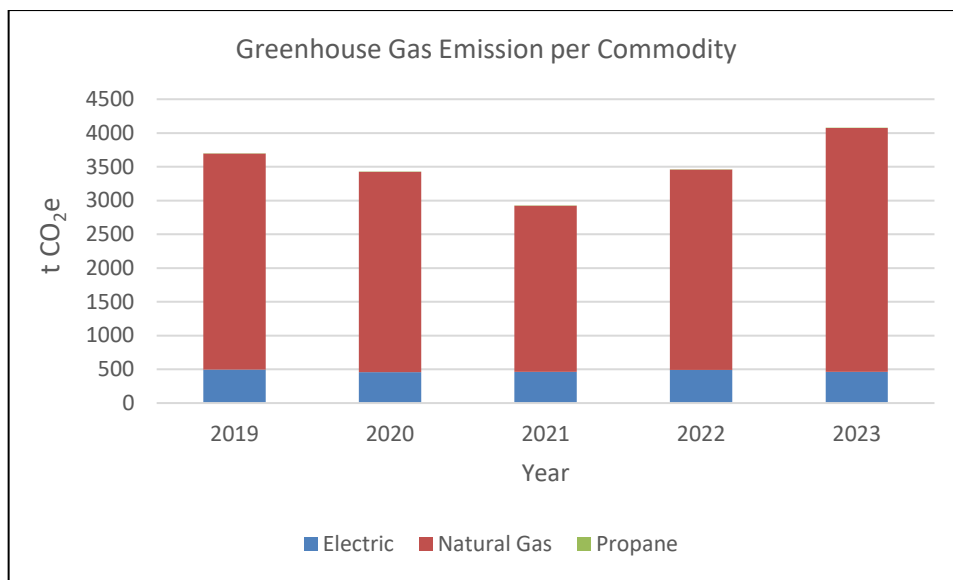


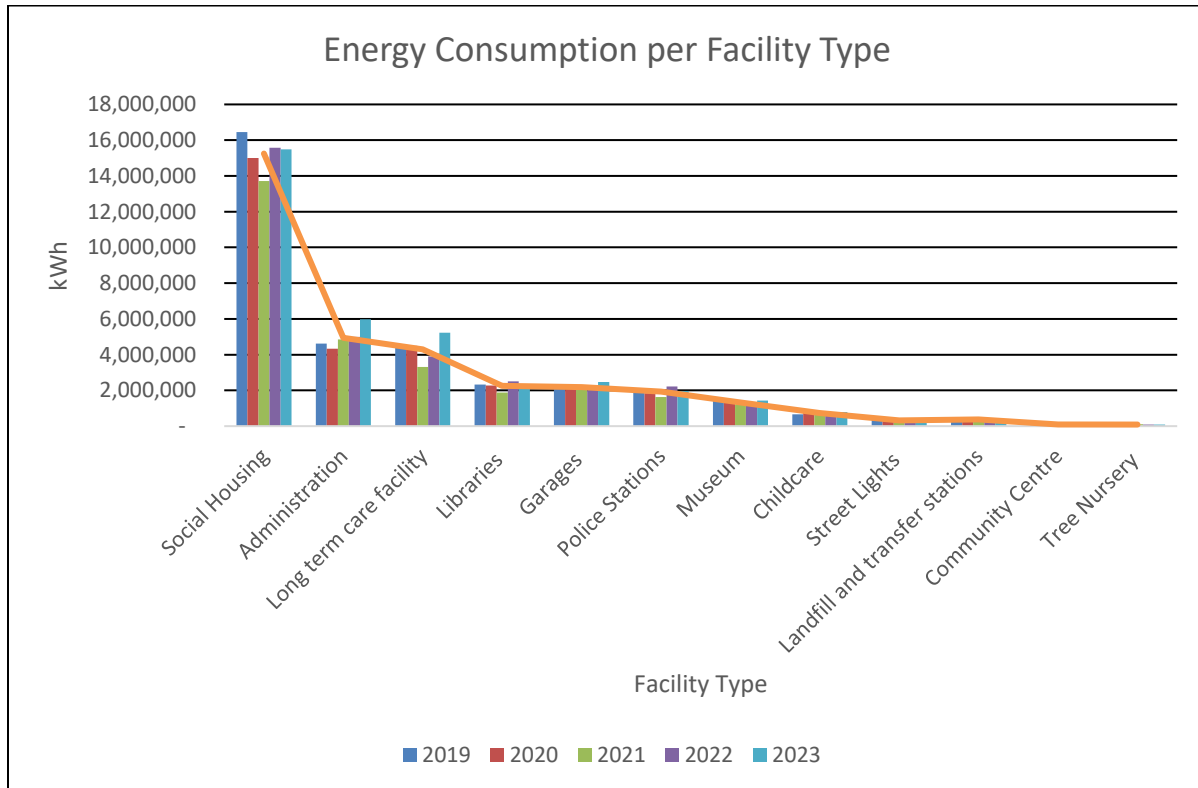
Figure 2: County of Wellington greenhouse gas emissions per commodity 2019-2023

### Energy Consumption and Greenhouse Gas Emissions by Facility Type

Most of the County’s facilities are social housing buildings (35 buildings). Social housing is the highest energy consumer and greenhouse gas emitter followed by the administration buildings (12 buildings), and the long-term care facility (Table 4 and Figure 3).

**Table 4: County of Wellington Energy Consumption (kWh) 2019-2023**

Facility Type	2019	2020	2021	2022	2023	% Change
Social Housing	16,943,564	15,573,140	14,220,919	16,046,741	15,987,728	-6%
Administration	4,578,740	4,280,676	4,812,712	4,964,966	5,775,622	26%
Long Term Care Facility	4,479,541	4,442,074	3,280,197	3,865,619	5,208,515	16%
Libraries	2,295,608	2,229,786	1,847,882	2,468,990	2,255,187	-2%
Garages	2,140,869	2,013,635	2,081,158	2,040,831	2,447,062	14%
Police Stations	1,976,016	1,796,304	1,597,105	2,182,231	1,952,546	-1%
Museum	1,410,551	1,265,774	1,183,128	1,183,128	1,406,448	0.3%
Childcare	632,694	785,351	627,727	669,164	774,866	22%
Streetlights	322,603	325,295	326,704	325,424	324,629	1%
Landfill Stations	376,806	326,568	283,898	371,552	313,328	-17%
Community Centre	61,252	51,874	62,717	62,717	56,856	-7%
Tree Nursery	53,363	51,946	67,081	63,135	62,723	18%
<b>Total kwh</b>	<b>16,943,564</b>	<b>15,573,140</b>	<b>14,220,919</b>	<b>16,046,741</b>	<b>15,987,728</b>	<b>4%</b>



**Figure 3: County of Wellington Energy Consumption per Facility Type 2019-2023**

As Table 4 and Figure 3 show, most of the County's facilities registered energy reductions in 2023 compared to 2019 such as social housing, landfill, police stations, libraries, museum, community centre, and street lighting.

- Landfill stations reported 17% energy reductions in 2023, compared to 2019.
- Police stations reported 2% energy reductions in 2023, compared to 2019.
- Libraries reported 2% energy reductions in 2023, compared to 2019
- Museum reported 0.3% energy reductions in 2023, compared to 2019.
- Community Centre reported 7% energy reductions in 2023, compared to 2019.

On the other hand, some County facilities registered energy usage increases in 2023 compared to 2019 (e.g. administration buildings, long term care facility, garages, and childcare).

- Administration buildings reported 26% energy increase in energy usage, as the County acquired three new administration buildings in 2023.
- The long-term care facility, Wellington Terrace, reported 16% energy increase, due to the change in the air flow system and adding more air flow equipment.
- Garages reported 13% energy increase, as the County acquired a new garage in Drayton.
- Childcare reported 22% energy increase. The County's new childcare centre, Wellington Place Childcare, built in 2019, worked at full capacity starting from 2022.
- Green Legacy reported 20% increase due to keeping the washroom building open through winter, heated by electric baseboard.

As Table 5 and Figure 4 show, some of the County's facilities registered greenhouse gas emission reductions in 2023 compared to 2019 such as:

- Landfill stations reported 9% greenhouse gas emission reductions in 2023 compared to 2019.
- Police stations reported 10% greenhouse gas emission reductions in 2023 compared to 2019.
- Libraries reported 15% greenhouse gas emission reductions in 2023 compared to 2019
- Street lighting reported 3% greenhouse gas emission reductions in 2023 compared to 2019.

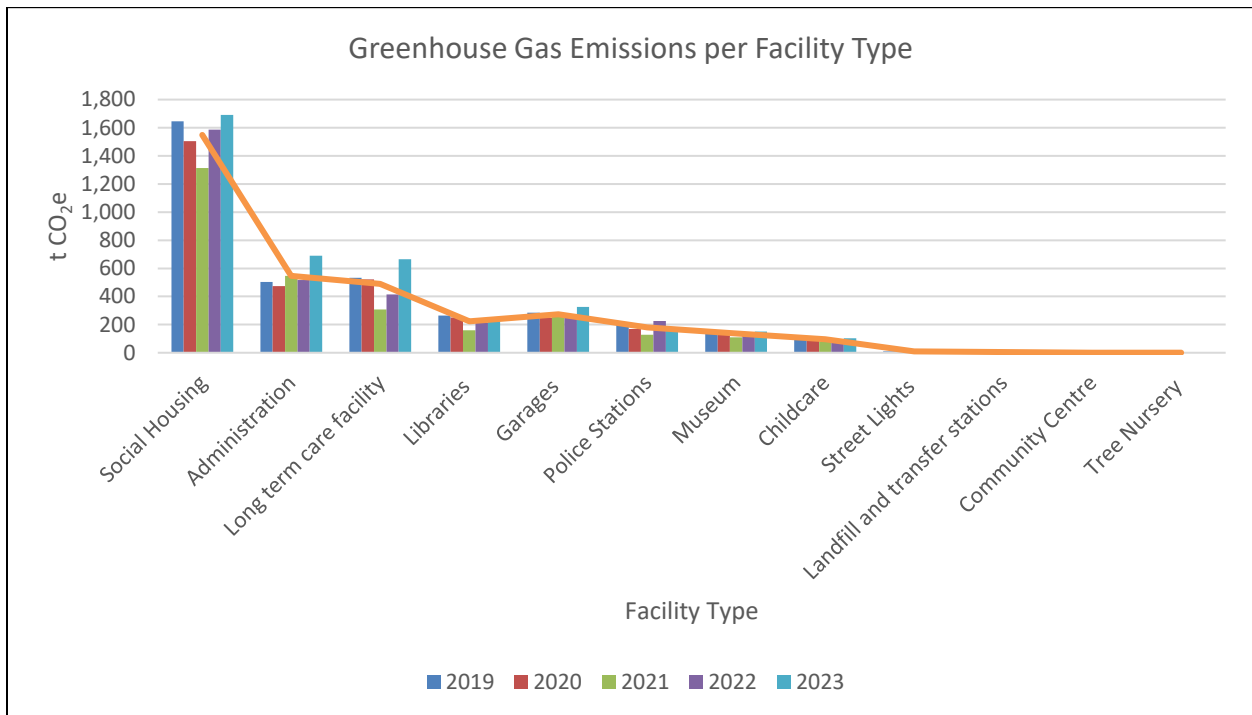
On the other hand, most of the County's facilities registered greenhouse gas emissions increases in 2023 compared to 2019:

- Administration buildings reported 37% greenhouse gas emissions increase, as the County acquired three new administration buildings in 2023.
- The long-term care facility, Wellington Terrace, reported 25% greenhouse gas emission increases, due to the change in the air flow system and adding more air flow equipment.
- Garages reported 14% greenhouse gas emission increases, as the County acquired new garage in Drayton.
- Childcare reported 4% greenhouse gas emission increase. The County's new childcare centre, Wellington Place Childcare, built in 2019, worked at full capacity starting from

2022.

**Table 5:** County of Wellington Greenhouse Gas Emission 2019-2023

Facility Type	2019	2020	2021	2022	2023	% Change
Social Housing	1,648	1,507	1,316	1,590	1,694	3%
Administration	504	473	547	518	690	37%
Long term care facility	533	523	309	415	664	25%
Libraries	265	251	160	216	224	-15%
Garages	284	249	259	249	325	14%
Police Stations	200	169	129	225	180	-10%
Museum	150	129	109	145	152	1%
Childcare	98	114	81	87	102	4%
Streetlights	9.53	9.28	9.32	9.29	9.27	-3%
Landfill stations	5	4	4	4	4	-9%
Community Centre	0.33	0.24	0.41	0.39	0.37	13%
Tree Nursery	1.03	1.06	1.39	1.26	1.25	21%
<b>Total (tCO<sub>2</sub>e)</b>	<b>3,698</b>	<b>3,429</b>	<b>2,925</b>	<b>3,460</b>	<b>4,046</b>	<b>9%</b>



**Figure 4:** County of Wellington Greenhouse Gas Emissions per Facility Type 2019- 2023

Although, some buildings reported a reduction in energy consumption, they reported an increase in greenhouse gas emissions due to the increase in the natural gas consumption. For example, Social Housing buildings reported 6% reduction in energy consumption. But Social

Housing showed 3% increase in the greenhouse gas emissions due to the increase in the natural gas consumption and the increase in the emissions factor of natural gas.

The County was planning to reduce energy consumption and greenhouse gas emissions by 3% in 2023. Due to COVID-19 and acquiring more buildings, County energy consumption and greenhouse gas emission increased by 4% and 9%, respectively.

### **COVID-19**

The COVID-19 pandemic created several changes to building operations which affected energy use for example:

- Indoor air quality improvements required:
  - Improved filtration (MERV 13),
  - UV disinfection units for each heat pump, and
  - Higher outdoor air intake.

The energy load for the buildings therefore increased and these changes will need to be noted when comparing year to year performance.

### **New Buildings**

The County's floor area increased by 1.3% between 2019 and 2023. The County added six new buildings in this period:

- Hillsburgh Library (10,106 ft<sup>2</sup>) in 2019.
- Wellington Place Childcare (6,190 ft<sup>2</sup>) in 2019.
- Drayton Garage (20,129 ft<sup>2</sup>) in 2020.
- 65 Delhi St (9,959 ft<sup>2</sup>) in 2021.
- 59, 69, 75 Woolwich St administration buildings (16,420 ft<sup>2</sup>) in 2023.

**5. Our Successes**

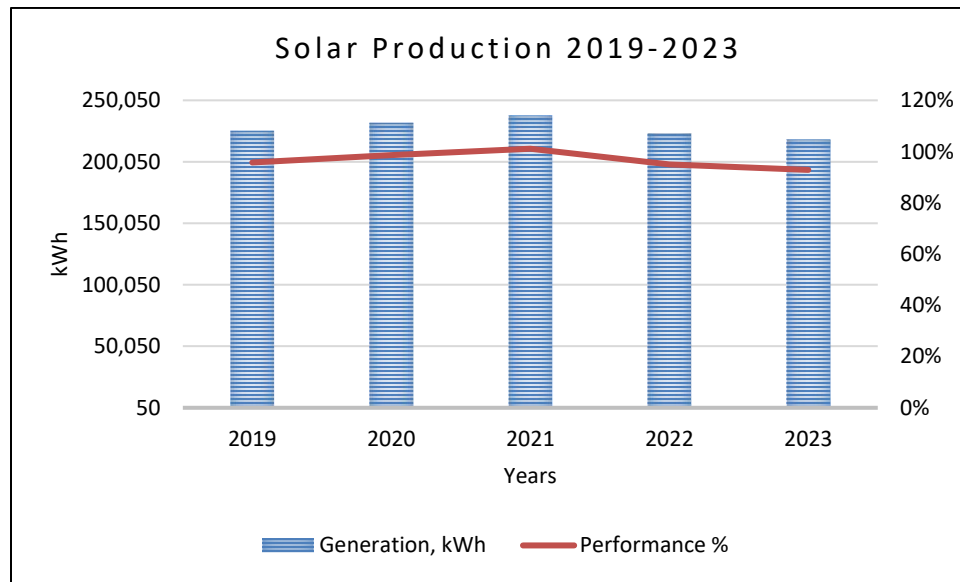
The County has completed numerous energy conservation projects in the last five years which have contributed significantly to controlling energy consumption and greenhouse gas emissions.

**Solar Panels**

The County currently has 15 rooftop/ground mounted solar photovoltaic units. Since 2019, County of Wellington solar panels have generated over 220 MWh of solar energy per year (Table 6 and Figure 5). This is equivalent to 63,800 kg of carbon dioxide saved, 1,106 trees planted, or 634 vehicles taken off the road.

**Table 6:** County of Wellington Solar Production and Performance 2019-2023

Year	2019	2020	2021	2022	2023
<b>Generation (kWh)</b>	225,162	231,782	237,643	223,179	218,220
<b>Performance %</b>	96%	99%	101%	95%	93%



**Figure 5:** County of Wellington Solar Production 2019-2023

**Energy Efficiency Projects in 2019-2023**

The County implemented several energy efficiency projects between 2019 to 2023. These projects focused on energy management, building envelop upgrades, equipment and building system controls, and lighting upgrades. Appendix B lists projects completed by the County in the last 5 years.

### Energy Management

In 2023, the County employed two energy management software solutions to establish an accurate database of the County's energy accounts and create energy maps for each facility. Using a utility management platform provides the County a complete picture of how buildings are operating, what their energy use is, and the cost of energy consumption.

### Building Envelope Upgrade

The County conducted several building envelope upgrade projects like replacing aluminum single pane windows with argon filled vinyl double pane, adding insulation to attics, roof replacement (Figure 6), and weatherization. Table 7 shows the list of building envelope projects.



**Figure 6:** Roof Replacement at 21 Douglas St. 2024

**Table 7:** List of the building envelope projects at the County between 2019-2023

Project type	Buildings
<b>Windows, doors, and siding replacement</b>	500 Ferrier - 28 social housing apartments (2021)
	33 Marlborough - 109 social housing apartments (2022)
	Applewood/Sunset – 47 social housing townhouses (2020)
	320-350 Derby – social housing 4-plex (2022)
	56 Mill St. – 15 social housing apartments (2022)
	27 Douglas St- administration offices
	232 Delhi St - 16 social housing apartments (2023)
	Fergus Library
<b>Attic Insulation/ roof insulation</b>	450 Albert St. - 41 social housing apartments (2022)
	235 Egremont St. - 11 social housing apartments (2022)
	56 Mill St. - 15 social housing apartments (2022)
	51 John St. - 16 social housing apartments (2022)
	22 Church St - 11 social housing apartments
	32 Hadati St - 89 social housing apartments
	38 Elizabeth - 12 social housing apartments
	212 Whites Road - 32 social housing apartments
	320-350 Derby, and 360 Derby - 16 social housing apartments
	Museum and Archives (2023)
<b>Roof Replacement</b>	74 Woolwich St - main administration centre
	21 Douglas (insulation added).
<b>Weatherization</b>	Teviotdale OPP added external weatherization
	Relaced the window film of the long-term care facility
	Replaced the windowsills of the long-term care facility
	Waterproofing the foundation of Badenoch Community Centre

### Equipment and Building System Controls

The County conducted several equipment and building system control projects (e.g. upgrading the control system, upgrading heating and cooling system with higher efficiency and lower greenhouse gas emissions models, upgrading appliances to high efficiency models, and upgrading to more efficient lighting). Table 8 shows the list of equipment and building system control projects.

In 2023, the County’s Social Housing Department received funding from Independent Electricity System Operator (IESO). The County engaged with IESO to replace old appliances at our eligible social housing units (fridges, stoves, air conditioners, chest freezers, lights, etc.) with energy efficient models. IESO provided a comprehensive support and energy-efficiency expert visit to identify opportunities to help save energy, receive upgrades, and replace eligible appliances for 1,371 eligible social housing units in the County.

**Table 8:** List of equipment and building system control projects at the County 2019-2023.

<b>Project</b>	<b>Type</b>	<b>Buildings</b>
<b>Control System and Fan Upgrades</b>	Upgraded manual thermostats with programmable digital models	Most of the social housing buildings
	Changed motor on cooling tower fan to a variable speed motor to save electricity	Courthouse
	Replaced pneumatic thermostats with basic building automation system	Courthouse, Old Post Office, Archives, Central Wellington OPP, Long Term Care Facility, and Wellington North OPP
<b>Heating and Cooling System Upgrades</b>	Replaced oil furnace with propane and added air conditioning	Badenoch Community Centre
	Replaced gas boilers with higher efficient models	Courthouse
	Replaced one of the heat pump air conditions to more efficient model	Old Gaol
	Replaced one make-up air	129 Wyndham St - Ontario Works
	Replaced the roof top unit for heating and cooling/with higher efficiency model.	Aboyne Library (Figure 7)
	Replaced the cooling system with higher efficiency model.	Rockwood OPP
	Replaced conventional gas MAU to condensing MAU	576 Woolwich St. and 387 Waterloo Avenue Court
<b>Appliance Replacements</b>	Replaced washing machines with higher efficiency models	Long Term Care Facility (Figure 8).
<b>Water Heater Replacement</b>	Replaced standard water heater with a tankless unit	15 Douglas
	Replaced water softener to higher efficient model	Wellington Terrace - Long Term Care Facility.
	Replaced natural gas water heater with electric water heater	Aboyne Library and Drayton Library (Figure 9)
	Replaced natural gas water heater with electric heat pump water heater	Courthouse and Fergus Library (Figure 10)
	Replaced the water heater pump and tank	Main Administration Building



**Figure 7:** New roof top unit at Aboyne Library



**Figure 8:** New washers (left); new dryers (right) at the Long-Term Care Facility



**Figure 9:** Electric water heater at Aboyne Library (right) and Drayton Library (left).



**Figure 10:** Heat Pump Water Heater-Court House (left) and Fergus Library (right).

**Lighting Upgrade**

In 2019, the County began the conversion of all the exterior lights to light emitting diode (LEDs) on all buildings. The County plans to upgrade all exterior lights, common area lights, and indoor lights (offices and suites). LED lighting is now standard for all new County buildings and buildings undergoing retrofits.

For indoor lighting, the County has recently completed several lighting efficiency projects, including lighting upgrades and lighting controls. Table 9 shows the County lights projects between 2019 to 2023.

**Table 9: Lights Retrofit Projects 2019-2023**

Project	Buildings
Occupancy sensors	Long Term Care Facility
Comon area lights and bathroom	Long Term Care Facility
All interior lights	Museum and Archive (Figure 11) Main Administration Building Courthouse Old Goal IT Building
Exterior lights	Rockwood OPP Social housing buildings (Figure 12 and 13): <ul style="list-style-type: none"> <li>• 65 Mill St and 411 Waterloo in 2020</li> <li>• 500 Ferrier and 387 Waterloo in 2021</li> <li>• 450 Ferrier and 33 Marlborough in 2022</li> <li>• 14 Centre in 2023</li> <li>• 232 Delhi St, 32 Hadati, 567 Woolwich St, 130 Grange St, and 212 Whites Road in 2024</li> </ul>



**Figure 11:** Museum Exhibit Hall (Left), Archive Reading Room (Right)



**Figure 12:** LED Exterior Lighting -387 Waterloo Court



Fergus Library

Courthouse

Aboyne Library

**Figure 13:** Example of LED Exterior Lighting

### **Skills Training**

To sustain a corporate culture of conservation, the County is pursuing an effective awareness and education programme for facility management staff. Facility managers have the lead responsibility in ensuring County facilities operate efficiently. In 2023, the County hosted two skills training sessions for facility management staff in partnership with the Canadian Home Builders' Association (CHBA):

- Advanced building science training
- Net zero renovation bootcamp

### **Energy Audits**

The first step in implementing an energy management program is the completion of energy audits for corporate facilities. Energy audits involve a technical review of a facility's mechanical systems and its operations, development and analysis of a baseline energy profile, and identification of energy management opportunities and savings.

In 2023, the County completed 20 ASHRAE Level 2 energy audits for high energy consumption buildings (Administration Buildings, Long Term Care Facility, Museum, Libraries, and Social Housing Facilities). Table 10 shows the buildings with completed energy audit and the estimated energy saving and emission reduction if recommendations are implemented.

**Table 10: ASHRAE Level 2 Energy Audit Expected Energy Savings and Emissions Reduction**

Building	Address	Floor space area (ft <sup>2</sup> )	Description	Estimated Energy Reduction	Estimated Emission Reduction
Willow/Dawson	15 Willow Road, Guelph	76,934	Social housing townhouse block	50%	90%
Speedvale Avenue Court	263 Speedvale Ave. E., Guelph	47,000	Two story apartment building	68%	70%
Grange Street Court	130 Grange St., Guelph	56,600	Two story apartment building	74%	74%
Marlborough Road Court	33 Marlborough Rd., Guelph	35,200	Two story apartment building	78%	84%
Dublin Street Court	229 Dublin St. N., Guelph	77,700	Three story apartment building	72%	83%
Delhi Street Court	232 Delhi St., Guelph	33,000	Two story apartment building	65%	81%
Woolwich Street Court	576 Woolwich St., Guelph	71000	Two story apartment building	65%	78%
Waterloo Ave. Court	411 Waterloo Ave., Guelph	30600	Two story apartment building	71%	84%
Waterloo Ave. Court	387 Waterloo Ave., Guelph	42,000	Two story apartment building	77%	84%
Mary Street Court	221 Mary St., Elora	13,267	Two story apartment building	71%	79%
Wellington Terrace Long Term Care	474 Charles Allen Way, Fergus	150,000	Two story long-term care facility	51%	69%
Wellington County Museum and Archives	536 Wellington Road 18, Fergus	46,000	Historical building, and new additional part	35%	44%
Aboyne Library	552 Wellington Road 18, Fergus	10,362	Renovated carnegie library	60%	89%
Fergus Library	190 St Andrew St W, Fergus	16,138	Renovated carnegie library	67%	93%
Palmerston Library	265 Bell St, Palmerston	5,000	Renovated carnegie library	49%	86%
Puslinch Library	29 Brock Rd, Puslinch	5,812	Constructed in 2011	56%	90%
Drayton Library	106 Wellington St S, Drayton	7,000	Originally constructed in 2009	56%	90%
Courthouse	74 Woolwich St, Guelph	16,460	Originally built in 1841, have several additions and renovations.	54%	89%
IT Building	21 Douglas, Guelph	5,841	Administration offices	70%	94%
Main Admin Building	74 Woolwich St, Guelph	27,000	Administration offices	50%	50%

## 6. Our Energy Conservation Plan

A critical part of any plan is the detailed list of specific actions needed to achieve an organization's objectives, goals, and targets. The County's action plan includes:

- Delivery of energy conservation and efficiency training for staff and employees. In 2024, the County was accepted into the Strategic Energy Management (SEM) Programme with IESO. The SEM program will support energy efficiency initiatives at the County over the next 24 months.
- Improvement of energy consumption reporting and tracking systems, using the new energy management software; and
- Utilization of the County's Climate Change Mitigation and Adaptation Fund to incorporate energy projects into the capital planning process.

The County of Wellington has developed a key project list which will provide the roadmap for energy conservation over the next five years. The projects fall under the following three broad categories:

- Management, maintenance, and monitoring of existing system.
- Upgrading building envelope and HVAC.
- Renewable energy.

### **Management, Maintenance, and Monitoring of Existing System**

Energy management is the effective use of energy to maximize profit and reduce cost. Energy management includes monitoring the energy consumption and maintain the energy control system. The County energy management projects include monitoring projects like adding submeter; management projects like set back temperatures; and maintaining and recommissioning of the existing BAS.

#### **Submeters**

The County was awarded funding from Green Municipal Fund to implement monitoring systems at seven municipal buildings (Table 11) that share HVAC and electrical systems. The installation of three submeters will help the County to monitor building consumption and find more energy saving opportunities.

**Table 11:** List of the County’s Buildings with Submeters

<b>Buildings</b>	<b>Shared Utility</b>	<b>Recommended submeter</b>
Wellington County Museum and Archives and Aboyne Library	Shared electricity	Candidate for submeter (electricity)
Courthouse and IT Building	Shared natural gas boiler/hydronic loop.	Candidate for submeter (hydronic loop)
Admin Centre, Old Gaol, and Governor’s Residence	Shared natural gas boiler/hydronic loop	Candidate for submeter (hydronic loop)

**Setback Temperature During Unoccupied Hours**

The purpose of the set back is to adjust the temperature setpoints during unoccupied building hours. Specifically, the unoccupied heating and cooling setpoints will be set to 18°C and be off, respectively. The setpoints follow the heating and cooling setpoint recommendations in the National Energy Code for Building (NECB) 2017 Operating Schedule C. By adjusting the unoccupied temperature setpoints, the building will maintain the same level of occupancy comfort during operating hours and reduce energy consumption required to condition the space while the building is unoccupied. Most of the County’s existing thermostats are programmable. The County plans to utilize the current thermostats to have occupied and unoccupied setpoints, if applicable. The County is planning to implement setback at buildings with programmable thermostats.

**Re-commissioning Building Automation System (BAS)**

Another important component of an energy management program is the re-commissioning of County’s BAS. Over the life cycle of a building, the mechanical building automation systems are adjusted daily to suit user room temperature requirements. Mechanical building automation system is sometimes over-looked when renovations take place or replacing equipment. Re-commissioning involves examining the original energy demand against any renovations and recalibrating the settings to suit today’s energy demand practices. Re-commissioning also ensures that the mechanical operating system is updated and appropriate to maximize building system efficiencies. The County proposes to re-commissioning the BAS in the coming five years at Wellington Terrace and Centre Wellington OPP.

**Upgrading Building Envelopes and HVAC**

Most of the County’s buildings are aged. Upgrading the building envelope and HVAC is a regular procedure every 20 to 25 years. Building envelopes protect the interior while facilitating climate control. A building envelope upgrade will include upgrading external walls, windows and doors, attic, ceiling, as well as the foundation and basement. Upgrading HVAC includes upgrading all equipment used for heating, cooling, ventilation, and water heating. Most HVAC equipment

have a lifespan of 15-20 years. The County plans to upgrade HVAC equipment with newer more energy efficient models.

### **Upgrade Exterior Windows, Doors, and Walls**

Many of the windows and doors in the County's buildings are over 25 years old and approaching end of life. The windows are aluminum frame and while many buildings have double glazed windows already, the seals on many of the units have deteriorated making them less efficient. Some buildings are four single pane slider windows, which are very inefficient. The County is planning to replace windows in these facilities between 2024-2029:

- 576 Woolwich St - 100 social housing apartments.
- 387 Waterloo St - 72 social housing apartments.
- 411 Waterloo St - 41 social housing apartments.
- 221 Mary St - 20 social housing apartments.

### **Upgrade Roofs and Install Metal Roofs**

Several flat roofs have reached their end of life and repairs are becoming costly. During the replacement of these roofs, the insulation on the roof structure will be increased thus reducing our annual heating demand and natural gas consumption. Metal roofs are environmentally friendly and more energy efficiency. The County plans to shift to metal roofs, when the roof life cycle ends, except buildings with heritage status. Most newly constructed County buildings have a metal roof (Puslinch Library, Marden Library, Hillsburgh Library, Rockwood OPP, Central Wellington OPP, Wellington North OPP, Central Garage, and Drayton Garage). Having a new roof surface will also allow us to realize the full benefits of new solar panels for their entire expected lifecycle.

The County plans to replace roofs at the following locations:

- 33 Marlborough Rd - 109 units social housing apartments.
- 263 Speedvale Ave - 62 apartment social housing apartments.
- 212 White Rd - 32 units of social housing apartments.
- 387 Waterloo St - 72 social housing apartments.
- 411 Waterloo St - 41 social housing apartments.
- 110 Edward St - 14 social housing apartments.
- 221 Mary St - 20 social housing apartments.

### **Upgrade Lighting**

The County continues to upgrade the existing pot lights and T8 fluorescent tubes with the equivalent LED fixture. Overall, the total annual energy reduction resulting from retrofitting lighting is estimated to be 35% of the lighting electricity consumption, lighting annual carbon emission, and lighting annual utility cost.

### **Upgrade Baseboard Electric Heat with Heat Pump**

The purpose of this upgrade is to replace the existing electric baseboard with air source variable refrigerant glow (VRF) heat pump systems that will provide heating and cooling. Some of the County's Social Housing buildings (seniors suites) are currently heated with electric baseboards controlled by a local thermostat. There are typically three baseboard heaters in each suite, one for the living room, the bedroom, and the bathroom. The suites do not have cooling as part of the original design, but some tenants have installed their own window-shaker air conditioning (AC) units. Since the proposed system will provide cooling to all units, there will be an electricity consumption penalty associated with adding a cooling system. Overall, the electricity consumption will decrease. Currently, this measure is proposed at our seniors social housing buildings only.

### **Upgrade Make-up Air Units with Heat Recovery Ventilation**

The purpose of this upgrade is to replace aging existing make-up air units with heat recovery ventilation. By implementing heat recovery, it utilizes return air from the space to preheat incoming outdoor air, which reduces the energy required to heat and cool the outdoor air.

## **Renewable Energy**

### **Solar Panels**

The County plans to install solar photovoltaic systems on available roof space coinciding with the installation of new roofs to avoid future disturbance of the systems. Additional solar arrays are planned to be added to several facilities in the near term (2024-2029) at the following locations:

- 387 Waterloo Ave
- 411 Waterloo Ave
- 33 Marlborough Rd
- 263 Speedvale Ave

Table 12 shows a detailed list of renewable energy projects included in the plan.

**Table 12:** List of the proposed County’s energy projects between July 2024 to June 2029.

Facility	Project	Electricity Annual Saving (kWh)	Natural Gas Annual Savings (m <sup>3</sup> )	Carbon Emission Reduction (kg CO <sub>2</sub> e)
Social Housing Senior buildings – 2 buildings	VRF Heat Pump conversion in suites	244,834	0	6,855
	Lighting retrofit of common area and suites	41,492	0	1,162
263 Speedvale Ave	Lighting retrofit of common area, and suites	18,361	0	514
	New Heat Recovery Make up air	-13,945	4,392	8,828
	Replacement of roof and windows	51,756	0	1,449
	Installing additional Solar Photovoltaic System	30,000	0	8700
232 Delhi St	Lighting retrofit of common area and suites	38,819	0	1,087
33 Marloborough Rd Court	Roof insulation	74,891	0	2,097
	Installing additional Solar Photovoltaic System	79,243	0	2,219
15 Willow Dawson/ 39 Dawson Rd	Roof insulation	0	69,630	133,764
411 Waterloo Ave	Replacement of windows, and roof insulation	149,225	0	4,178.00
	Installing Solar Photovoltaic System	77,400	0	2,167
387 Waterloo Ave	Replacement of windows, and roof insulation	124,357	0	3,482
	Installing additional Solar Photovoltaic System	93,548	0	2,619
576 Woolwich St	Replacement of windows, and roof insulation	189,602	0	5,309
	Light retrofit of common area	32,289	0	904
221 Mary St	Replacement of windows, and roof insulation	27,054	0	758
14 Centre St	Replacement of windows, and roof insulation	2,800	1,000	1,999
51 John St	Window replacement	15,000	0	420

Facility	Project	Electricity Annual Saving (kWh)	Natural Gas Annual Savings (m <sup>3</sup> )	Carbon Emission Reduction (kg CO <sub>2</sub> e)
212 Whites Rd	Window, doors, siding, and roof replacement	24,000	1,500	9,842
	light retrofit	2,500	0	725
County Libraries	Setback temperature during unoccupied hours if applicable	13,574	8,692	4,733
	Complete lighting retrofit of interior areas (Drayton library)	16,019	0	449
	Furnace replacement / air source heat pump to be considered (Drayton library & Arthur library)	-51,846	31,314	4,274
Museum and Archives	Upgrade condensing gas fired boilers	0	2,441	4,688
Wellington Terrace	BAS recommissioning	37,273	5,482	11,575
	AHU's and MAU's replacement with RTU Heat Pumps	-115,438	111,427	210,819
Centre Wellington OPP	BAS recommissioning	48,000	2,000	17,282
	Replace exterior parking lighting with LED	2,000	0	580
<b>Total</b>		<b>1,252,808</b>	<b>237,878</b>	<b>453,478</b>

# Appendices

**Appendix A: List of All Facilities Included in Plan Energy Consumption kWh 2019-2023**

Building Name	Area ft <sup>2</sup>	2019	2020	2021	2022	2023	Change Over 2019			kWh per ft <sup>2</sup>
59 Woolwich St	3,250	-	-	-	-	4,678**	N/A	N/A	N/A	N/A
69 Woolwich St	6,097	-	-	-	-	4,313**	N/A	N/A	N/A	N/A
75 Woolwich St	6,695	-	-	-	-	11,745**	N/A	N/A	N/A	N/A
Aberfoyle Garage	3,500	185,062	197,765	149,319	144,488	185,918	857	0%	▲	53.1
Aberfoyle Transfer Station	630	29,672	28,971	23,127	27,164	24,830	(4,842)	-16%	▼	39.4
Aboyne Library	10,000	113,457	91,227	60,757	86,371	92,383	(21,074)	-19%	▼	9.2
Admin - Gym & OW (116, 127, 129)	60,630	582,044	711,805	1,089,510	955,690	662,073	80,029	14%	▲	10.9
Admin Centre - Courthouse	22,496	1,165,136	1,079,870	997,921	1,009,474	2,419,077	1,253,941	108%	▲	107.5
Admin Centre - Governor's Res & Old Gaol	19,040	215,552	178,533	201,387	382,709	347,602	132,050	61%	▲	18.3
Administration Centre	27,000	1,489,588	1,300,422	1,466,798	1,341,512	1,160,503	(329,085)	-22%	▼	43.0
Arthur Garage	6,350	183,687	160,985	133,894	145,149	157,624	(26,063)	-14%	▼	24.8
Arthur Library and Medical Centre	12,968	255,310	172,371	210,930	253,568	257,124	1,814	1%	▲	19.8
Badenoch Community Centre	10,000	61,208	51,811	62,837	50,963	56,772	(4,436)	-7%	▼	5.7
Belwood Transfer Station	500	10,753	9,506	10,088	11,644	11,120	367	3%	▲	22.2
Brucedale Garage	6,600	209,183	168,648	155,511	151,962	182,914	(26,269)	-13%	▼	27.7

Building Name	Area ft <sup>2</sup>	2019	2020	2021	2022	2023	Change Over 2019			kWh per ft <sup>2</sup>
Central Garage	25,485	689,700	762,599	728,551	720,033	815,566	125,866	18%	▲	32.0
Centre Wellington OPP	10,000	772,184	699,801	628,076	768,770	646,314	(125,870)	-16%	▼	64.6
Clifford Library and Medical Centre	7,966	118,228	101,987	90,495	120,476	166,575	48,347	41%	▲	20.9
Communications - Admin	2,004	73,765	61,866	73,036	35,620	47,039	(26,726)	-36%	▼	23.5
Consolidated lights	-	323,628	326,366	327,751	326,480	325,672	2,044	1%	▲	N/A
Dominion Old Post Office-Admin	30,000	745,913	642,731	698,879	972,818	732,738	(13,174)	-2%	▼	24.4
Drayton Library	9,000	306,396	303,040	184,310	251,716	260,999	(45,397)	-15%	▼	29.0
Elora Garage	5,150	152,513	124,236	113,462	105,820	115,553	(36,960)	-24%	▼	22.4
Elora Library	5,015	113,552	105,887	95,071	100,023	113,916	364	0%	▲	22.7
Elora Transfer Station	150	13,606	11,270	11,148	10,489	10,718	(2,888)	-21%	▼	71.5
Erin Garage	5,400	206,632	173,772	183,599	197,379	187,738	(18,894)	-9%	▼	34.8
Fergus Library	16,138	349,737	585,001	360,652	477,022	482,777	133,039	38%	▲	29.9
Harriston Garage	5,900	211,844	161,132	149,582	218,327	191,082	(20,762)	-10%	▼	32.4
Harriston Library	11,367	242,145	212,487	187,165	245,559	215,294	(26,851)	-11%	▼	18.9
Harriston Transfer Station	300	15,349	13,147	12,876	13,440	11,751	(3,598)	-23%	▼	39.2
Hillsburgh Library	10,106	237,063	174,039	222,506	192,291	210,573	(26,490)	-11%	▼	20.8
Marden Library	6,341	60,819	42,489	24,046	43,710	33,601	(27,218)	-45%	▼	5.3
Mount Forest - Early Years & Childcare	12,820	378,658	371,133	294,601	303,215	383,448	4,790	1%	▲	29.9

Building Name	Area ft <sup>2</sup>	2019	2020	2021	2022	2023	Change Over 2019			kWh per ft <sup>2</sup>
Mount Forest Library	7,362	125,854	111,675	112,053	132,461	137,571	11,718	9%	▲	18.7
Museum And Archives	72,400	1,410,555	1,265,773	1,183,019	1,407,346	1,406,363	(4,192)	0%	▼	19.4
New Drayton Garage	25,485	145,379**	169,312	388,991	270,082	450,277	N/A	N/A	N/A	17.6
Old Drayton Garage	6,750	156,870	95,186	78,249	87,591	160,389	3,519	2%	▲	23.8
Ontario Works – Fergus - Admin	5,050	162,658	172,264	144,357	151,471	210,826	48,167	30%	▲	41.7
Our Food Future	1,800	64,566	56,024	54,714	23,273	92,497	27,931	43%	▲	51.4
Palmerston Library	5,000	175,615	149,801	140,788	142,046	140,980	(34,635)	-20%	▼	28.2
Puslinch Library	5,000	197,428	179,785	159,216	199,528	143,478	(53,950)	-27%	▼	28.7
Riverstown Landfill	7,000	294,642	251,228	214,809	296,480	239,956	(54,686)	-19%	▼	34.3
Rockwood OPP	18,000	432,643	440,863	396,483	454,474	503,256	70,613	16%	▲	28.0
Rothsay Transfer Station	150	12,785	12,447	11,851	12,336	14,952	2,168	17%	▲	99.7
Social Housing - 38 Elizabeth St	7,391	192,799	167,447	148,122	160,153	158,830	(33,969)	-18%	▼	21.5
Social Housing - 387 Waterloo Ave	42,916	969,892	886,967	715,968	798,233	779,731	(190,161)	-20%	▼	18.2
Social Housing - 39 Dawson Rd	77,000	630,968	571,918	503,599	495,428	502,270	(128,697)	-20%	▼	6.5
Social Housing - 4 Applewood Cres	48,320	249,695	223,513	189,451	205,427	208,073	(41,622)	-17%	▼	4.3

Building Name	Area ft <sup>2</sup>	2019	2020	2021	2022	2023	Change Over 2019			kWh per ft <sup>2</sup>
Social Housing - 411 Waterloo Ave	29,274	707,173	627,474	505,796	704,453	543,852	(163,321)	-23%	▼	18.6
Social Housing - 450 Albert St	26,124	549,056	539,919	504,645	561,554	503,591	(45,465)	-8%	▼	19.3
Social Housing - 450 Ferrier St	26,641	648,281	609,410	491,277	488,345	431,004	(217,277)	-34%	▼	16.2
Social Housing - 500 Ferrier St	18,410	411,170	404,053	412,272	360,729	360,422	(50,748)	-12%	▼	19.6
Social Housing - 51 John St	11,050	264,742	233,745	224,049	266,888	223,919	(40,823)	-15%	▼	20.3
Social Housing - 56 Mill St	8,247	209,671	207,267	181,051	151,319	123,420	(86,251)	-41%	▼	15.0
Social Housing - 576 Woolwich St	64,386	1,298,718	1,016,053	912,892	1,189,997	971,709	(327,009)	-25%	▼	15.1
Social Housing - 65 Delhi St	9,959	-	-	58,915**	347,050	216,512	216,512	N/A	N/A	21.7
Social Housing - Edinburgh Ave	17,904	344,325	274,821	175,758	251,622	269,737	(74,588)	-22%	▼	15.1
Social Housing-110 Edward St	9,979	239,876	226,864	192,039	226,290	215,262	(24,614)	-10%	▼	21.6
Social Housing - 12 Sunset Rd	48,320	407,782	336,079	313,173	306,393	326,470	(81,311)	-20%	▼	6.8
Social Housing-130 Grange St	46,000	925,746	807,867	751,329	913,483	910,903	(14,843)	-2%	▼	19.8
Social Housing-133 Frederick St	6,762	119,856	119,367	108,265	127,837	125,353	5,497	5%	▲	18.5
Social Housing-14 Centre St	11,902	288,404	233,462	229,175	233,740	211,529	(76,875)	-27%	▼	17.8

Building Name	Area ft <sup>2</sup>	2019	2020	2021	2022	2023	Change Over 2019			kWh per ft <sup>2</sup>
Social Housing-15 Willow Rd	77,000	1,045,644	959,372	870,080	898,268	942,834	(102,810)	-10%	▼	12.2
Social Housing-165 Gordon St	64,357	1,030,106	912,030	641,506	817,089	841,045	(189,061)	-18%	▼	13.1
Social Housing-169 Gordon St	61,936	48,533**	256,192	929,698	371,043	1,537,313	1,488,779	N/A	N/A	24.8
Social Housing-182 George St	10,300	266,178	292,604	203,236	267,650	267,308	1,130	0%	▲	26.0
Social Housing-212 Whites Rd	21,744	406,439	412,186	384,967	387,590	374,665	(31,774)	-8%	▼	17.2
Social Housing-22 Church St	6,266	165,114	145,862	141,778	142,986	120,955	(44,159)	-27%	▼	19.3
Social Housing-221 Mary St	13,267	254,103	291,951	210,144	241,840	233,863	(20,240)	-8%	▼	17.6
Social Housing-229 Dublin St N	49,408	1,069,216	930,032	855,629	930,298	889,972	(179,244)	-17%	▼	18.0
Social Housing-232 Delhi ST	20,100	733,597	633,624	612,441	944,232	699,077	(34,520)	-5%	▼	34.8
Social Housing-235 Egremont St N	6,266	159,849	130,832	147,494	158,778	161,909	2,059	1%	▲	25.8
Social Housing-250 Daly St	11,300	136,506	218,641	174,580	128,974	151,563	15,057	11%	▲	13.4
Social Housing-261 Speedvale Ave	16,000	347,569	311,406	287,298	295,099	262,497	(85,072)	-24%	▼	16.4
Social Housing-263 Speedvale Ave	16,000	523,475	486,671	388,738	433,641	445,688	(77,787)	-15%	▼	27.9

Building Name	Area ft <sup>2</sup>	2019	2020	2021	2022	2023	Change Over 2019			kWh per ft <sup>2</sup>
Social Housing-32 Hadati Rd	61,080	1,268,422	1,148,154	943,321	1,252,424	1,075,173	(193,249)	-15%	▼	17.6
Social Housing-320 Derby St	20,405	78,667	76,601	64,770	58,254	54,152	(24,515)	-31%	▼	2.7
Social Housing-33 Marlborough Rd	20,510	739,793	713,683	590,526	732,639	685,203	(54,590)	-7%	▼	33.4
Social Housing-360 Derby St	7,670	212,197	167,076	156,940	196,993	161,924	(50,274)	-24%	▼	21.1
Southern Green Legacy Tree Nursery	14,400	53,363	51,946	67,081	63,135	62,723	9,361	18%	▲	4.4
IT building	5,814	79,519	77,161	86,109	92,398	82,531	3,012	4%	▲	14
Wellington North OPP	18,600	771,190	655,640	572,546	958,987	802,977	31,787	4%	▲	43.2
Wellington Place Childcare	6,190	57,359**	224,779	185,631	205,817	215,101	157,741	N/A	N/A	34.7
Long Term Care Facility	150,000	4,479,541	4,442,074	3,280,197	3,865,619	5,208,515	728,974	16%	▲	34.7
Willowdale Day Care	4,600	196,676	189,439	147,495	160,131	176,317	(20,359)	-10%	▼	38.3
<b>Total</b>	<b>1,706,693</b>	<b>35,021,318</b>	<b>33,143,437</b>	<b>30,333,481</b>	<b>34,233,796</b>	<b>36,545,731</b>	<b>1,524,413</b>	<b>4%</b>	<b>▲</b>	<b>21.5</b>

\*\* Incomplete data

▼ Decrease in 2023 energy consumption, comparing to 2019

▲ Increase in 2023 energy consumption, comparing to 2019

Notes:

- These numbers have not been adjusted for weather or occupancy rates, both of which can be significant factors in energy usage.
- COVID-19 increased the energy load for the buildings; this increase will need to be noted when comparing energy consumption before COVID-19 and after COVID-19.

**Appendix B: Energy Management Previous Action Plan**

No.	Facility	Project Type	Measure	Description	Status
<b>1 Create a Culture of Conservation</b>					
1.1	Across Organization	Training	Organizational Capacity	Energy Training for maintenance managers (up to 75% incentive available).	Delayed
1.2	Across Organization	Training	Organizational Capacity	Employee challenge (e.g. Efficiency Treasure Hunt).	Delayed
<b>2 Managing and Monitoring Existing Systems</b>					
2.1	Purchasing	Procurement	Policy	Add life cycle costing as a criterion for all capital projects. Include ongoing energy costs to RFP requests. Update policies to include energy efficiency and low carbon materials (e.g. green concrete, recycled products, low carbon vehicle fleet, green energy) in procedures.	In progress
2.2	Across Organization	Energy Data	Monitoring and Targeting	Review historical energy data and record keeping to verify and correct as necessary.	Completed
2.3	Across Organization	Energy Data	Monitoring and Targeting	Create a monitoring and targeting process to provide timely energy data to building managers to aid in trouble shooting in tracking improvements.	Initiated
2.4	Across Organization	Energy Data	Measurement and Verification	Select key facilities and projects and complete detailed energy analysis (regression analysis with CUSUMs using RETScreen) to determine energy trends and size of energy savings.	Completed
2.5	Across Organization	Energy Data	Policy	Develop building controls (e.g. automation) policy/procedures.	Not yet Initiated
<b>3 Identification of New Opportunities</b>					

No.	Facility	Project Type	Measure	Description	Status
3.1	Across Organization	Project Identification	Energy Audits and Walkthrough Assessments	Complete energy audits on 5 of the highest energy users at the County and Walkthrough Assessments of 10 others to identify savings opportunities.	Completed
3.2	Across Organization	Energy Data	Sub-metering Critical Loads		In progress
3.3	Across Organization	Building Recommissioning	Building recommissioning	Complete recommissioning on 5 administration buildings	Delayed
3.4	Across Organization	New builds	Policy	Low GHG emissions heating and cooling systems	Initiated
3.5	Across Organization	New builds	Policy	Update green design guidelines	Initiated
3.6	Across Organization	Project Identification		Investigate feasibility of connecting to City of Guelph District Energy at City of Guelph admin buildings	Cancelled
3.7	Across Organization	Project Identification		Investigate feasibility of solar air pre-heating (e.g. Solar Wall) on Admin buildings, Wellington Terrace, garages, and multi-residential buildings	Cancelled
3.8	Across Organization	Project Identification	Heat reclaims	Investigate opportunities for heat reclaim in Admin offices, multi residential buildings, terrace, and garages.	Initiated
<b>4 Upgrading Building Systems and Envelope</b>					
4.1	Museum	Lighting	Upgrade	Upgrade remaining interior lighting fixtures with LED (approximately 60% remain to be upgraded)	Completed
4.2	Rockwood OPP	Lighting	Lighting	Upgrade interior lighting to LED	Completed
4.3	Admin Office (74 Woolwich St)	Lighting	Upgrade	Upgrade T8 Lighting to LED	Completed
4.4	Admin Office (21 Douglas St.)	Lighting	Upgrade	Upgrade exterior lighting to LED - Currently have 5 HPS Wall Packs	Completed
4.5	Courthouse	HVAC	Controls	Install variable speed fans on the HVAC system.	Completed
4.6	Courthouse	HVAC	Controls	Replace pneumatic controls with electronic	Completed

No.	Facility	Project Type	Measure	Description	Status
4.7	Courthouse	HVAC	Controls	Review feasibility of demand-controlled ventilation for courtrooms.	Cancelled
4.8	Erin Shop	HVAC	Controls	Shop to be replaced in 2024	Not yet initiated
4.9	Harriston Shop	HVAC	Controls	Replace older thermostats with digital programmable models. Program temperature setbacks for space heating during unoccupied periods.	Cancelled
4.10	Wellington Terrace	Lighting	Upgrade	Replacing approximately 190 wall mounted fluorescent fixtures in residence, common and bathrooms with LED	Completed
4.11	Wellington Terrace	Lighting	Upgrade	Finish internal lighting upgrades including dining room lights from CFL to LED	Completed
4.12	Wellington Terrace	Lighting	Controls	Install occupancy sensors in all RHA (12 Washrooms and 6 Med Rooms)	Completed
4.13	Wellington Terrace	Brine Reclaim	Water Softener	Save approx. 110 gallons of water per day. Save approx. 30% of water softener salt per regeneration. (7.5 to 5 bags of salt per regeneration)	Completed
4.14	Wellington Terrace	Laundry Facilities	Laundry machine replacements	Replace 13-year-old machine with higher efficiency models	Completed
4.15	Wellington Terrace	HVAC	A/C replacement	Lifecycle replacement	Delayed
4.16	Social Housing	HVAC	Controls	Upgrade older thermostats with programmable digital models	Completed
4.17	Social Housing	Building Envelope	Window Upgrade	Replacing aluminum single pane windows with argon filled vinyl double pane on several buildings	In progress
4.18	Social Housing	Lighting	Upgrade	Replace interior corridor lighting with LED in several buildings	In progress

No.	Facility	Project Type	Measure	Description	Status
4.19	Social Housing	Lighting	Upgrade	Replace exterior lighting with LED in several locations	In progress
4.2	Museum	HVAC	Upgrade	Install new high efficiency AC unit	Delayed
4.21	129 Wyndham St	HVAC	Upgrade	Investigate need for right-sizing air conditioner unit for server	Not yet initiated
4.22	131 Wyndham St	Lighting	Upgrade	Replace interior corridor lighting with LED	Not yet initiated
4.23	Rockwood OPP	Lighting	Upgrade	Replace exterior parking lighting with LED	Completed
4.24	Centre Wellington OPP	Lighting	Upgrade	Replace exterior parking lighting with LED	Not yet initiated