



WASTE MANAGEMENT  
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*Growing stronger together*



JULY 2024

# Energy Management Plan

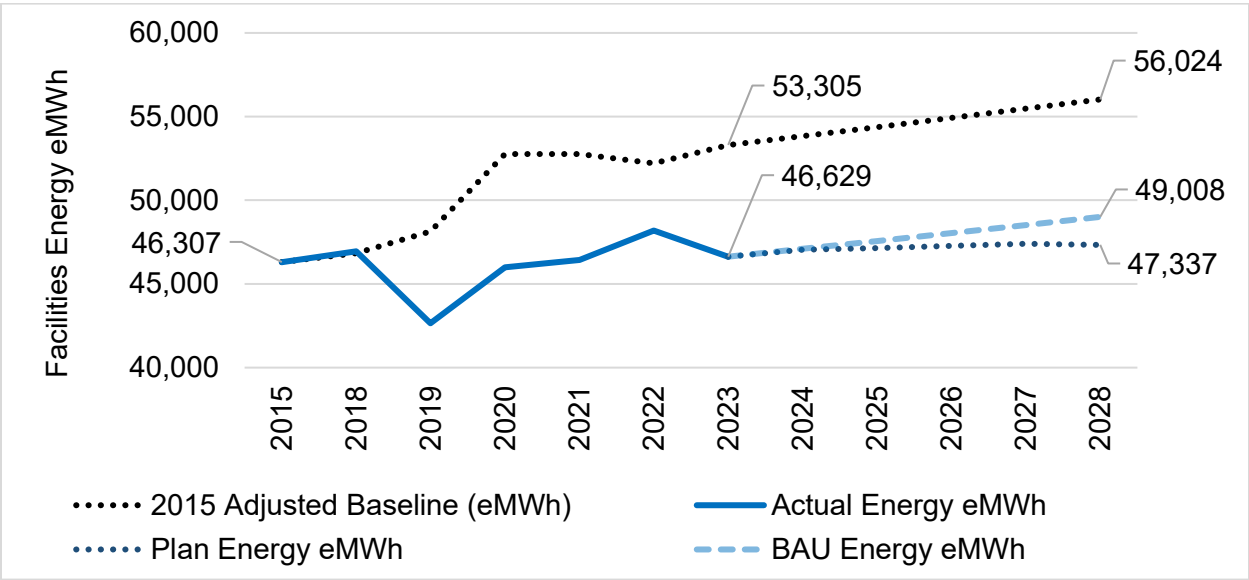
# EXECUTIVE SUMMARY

This Energy Management Plan (the “Plan” or EMP-2024) is written in accordance with [O. Reg. 25/23](#), of the *Electricity Act*, 1998. The scope of this Plan relates energy conservation efforts associated with the County’s corporate facilities assets, including process plants. Other non-facilities, energy related activities such as fleet, renewable energy systems and biogas production, are included for information and coordination purposes.

The initiatives proposed in the most recent iteration of the Plan (EMP-2019) projected avoidances of 6.6% (3,049 eMWh) in energy consumption and 9.7% (388 tCO2e) in GHG emissions, over 2015 facilities energy consumption and GHG emissions levels. As of 2023, initiatives completed or pending completion are anticipated to result in avoidances of 3.2% (1,473 eMWh) in energy consumption and 2.6% (114 tCO2e) in GHG emissions over 2015 levels. In addition, the first Annual Energy Report was completed and received by County Council in 2023, for the reporting year 2022.

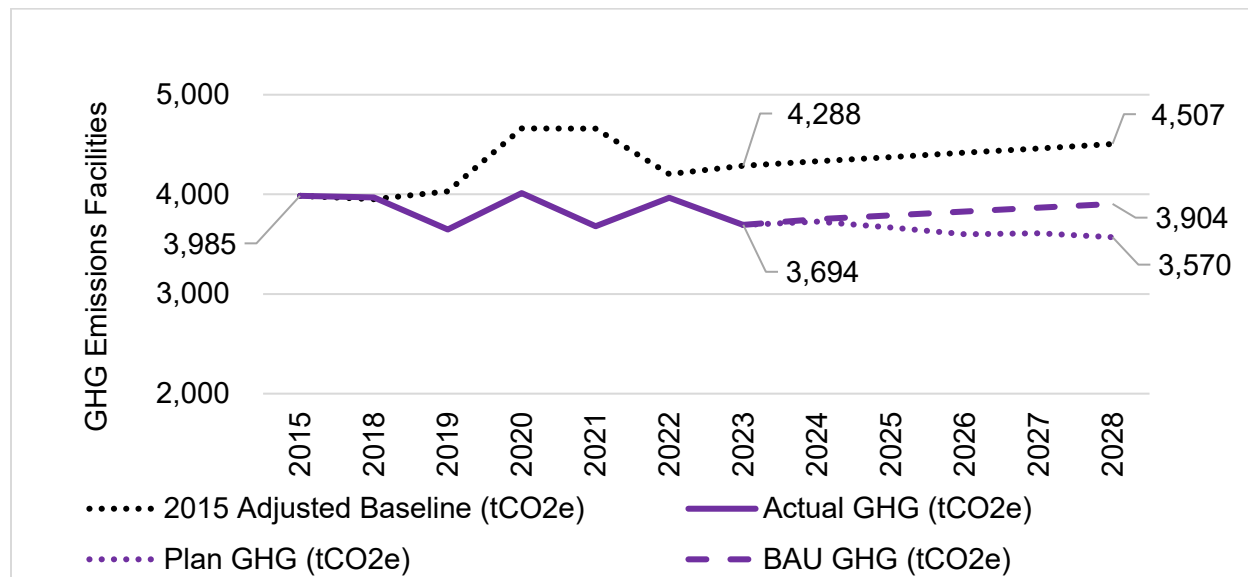
This report provides an annual overview of energy, renewable energy harvesting and GHG emissions from all County assets. Refer to Figure 1 and Figure 2 below for details on the County’s progression from baseline year 2015, to the end of the term of this current plan in 2028.

Figure 1 shows the 2015 energy consumption baseline of 46,307 eMWh, as well as the adjusted 2015 baseline that would result in 56,024 eMWh by 2028. The 2015 Adjusted Baseline takes into account organizational growth that has occurred since the original targets were set in 2015, and assumes the same energy efficiency levels. It then shows that actual consumption in 2023 of 46,629 eMWh was achieved when factoring in actual service growth. Finally, a projection of 49,008 eMWh in 2028 if the County continues with Business As Usual (BAU) from today having only implemented energy efficiency measures as of the end of 2023, versus a projection of 47,337 eMWh which is anticipated to result from this Plan.



**Figure 1: County Facilities Energy Consumption Trending**

Similarly, Figure 2 analyzes GHG emissions with a 2015 baseline of 3,985 tCO<sub>2</sub>e, as well as the adjusted 2015 baseline of 4,507 tCO<sub>2</sub>e by 2028. In contrast, 2023 actual GHG emissions from County facilities was 3,694 tCO<sub>2</sub>e, with a 2028 projection after implementation of this plan of 3,570 tCO<sub>2</sub>e.



**Figure 2: County Facilities GHG Emissions Trending**

In 2023, County Facilities avoided 6,676 eMWh (12.5%) and 1,143 tCO<sub>2</sub>e (24%) in GHG emissions, when comparing 2023 actuals with 2015 Adjusted Baseline (to 2023 variables).

This Plan (EMP-2024) proposes initiatives that are expected to result in a reduction of 2.9% (1,670 eMWh) in energy consumption and 7.4% (334 tCO<sub>2</sub>e) in GHG avoidance in the final year of the Plan (2028), when compared with 2015 Adjusted Baseline (to 2028 variables including growth). With an investment of \$5.2 million to complete these initiatives, offset by just over \$1 million in provincial grant funding and incentives secured to date, the total expense to the County will be around \$4.2 million. With a cost avoidance of \$4.6 million over 20 years, the initiatives will pay for themselves within fifteen years of this Plan’s completion.

This Plan will be reviewed periodically with implementation subject to annual Business Plan and Budget approval. This Plan fulfills the County’s regulatory requirements under the [O. Reg. 25/23](#) of the [Electricity Act, 1998](#), providing a roadmap for contributing towards the County’s 100% Renewable Energy (RE) Goals, and promotes energy conservation within the County as a corporation.

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# PREFACE

On June 24, 2015, Oxford County Council unanimously passed the 100% Renewable Energy (RE) goal by 2050. Since that date, County Council has thoroughly committed itself to sustainability with the addition of the Zero Waste, Zero Poverty and 100% Housed initiatives. This Energy Management Plan (EMP or the Plan), now in its third regulatory update, aims to complement these initiatives by further realizing energy savings and reducing the carbon footprint of Oxford County as an organization. With the adoption of this plan, staff will remain dedicated to implementing initiatives outlined within this plan and to further strengthen the position of energy conservation within Oxford County.

## 1 OVERVIEW

### 1.1 About Oxford County

Oxford County is an upper-tier municipality located in southwestern Ontario and home to approximately 122,000 residents (estimated based on 2021 Census). This represents growth of about around 10% over 2016 levels. The services provided by the County include, but are not limited to, engineering services, facilities, fleet, housing, libraries, planning, long-term care, paramedic services, roads, waste management, woodlands conservation, water and wastewater collection and treatment. Refer to Table 1 below for a summary of Oxford County growth from the Statistics Canada, Census of Population.

**Table 1: Oxford County Population Trend**

Census Year	Population Oxford County	Population Increase % over prior Census
2006	102,756	-
2011	105,719	3%
2016	110,862	5%
2021	121,781	10%

### 1.2 Energy Management Plan – Why?

An energy management plan plays an integral role in reducing greenhouse gas (GHG) emissions and energy consumption; improving energy efficiency; establishing financial stability;

and increasing renewable energy generation (or harvesting). All of these attributes ultimately aim at maintaining a sustainable source of energy and mitigating climate change.

As laid out in [Canada's Mid-Century Long-Term Low-Greenhouse Gas Development Strategy](#), one of the main pathways to limiting global temperatures to below 2°C is energy efficiency. The International Energy Agency estimates that 38% of the required global emissions reductions associated with a 2°C pathway could be met through energy efficiency improvements.

In addition to these compelling reasons, there are numerous other reasons why an energy management plan is essential to an organization as described below.

## 1.2.1 Provincial Mandate

The energy management plan was initially established in 2011 through O. Reg. 397/11 under the *Green Energy Act, 2009*. As of January 1, 2019, regulation 397/11 was revoked by the provincial government along with the repeal of the *Green Energy Act*. However, O. Reg. 397/11 has since been rebranded as O. Reg. 507/18 made under the *Electricity Act, 1998*, and further updated as O.Reg. 25/23.

Within O. Reg. 25/23, Ontario public agencies, including municipalities, are required to post on their website and report annual energy consumption and GHG emissions to the Ministry of Energy, Northern Development and Mines by July 1 of each year, for the year prior. In 2024, public agencies are required to report on both 2022 and 2023 data. In addition to annual reporting, each public agency was required to post an initial energy management plan by July 1, 2014 followed by an updated plan every five years. This plan was updated in 2019, and in addition to this current 2024 plan, will require an update by July 1, 2029. To maintain compliance with O. Reg. 25/23, the County must provide information on the following within each updated plan:

1. Annual energy & GHG emissions
  - A summary of annual greenhouse gas emissions for each of the public agency's prescribed operations, which shall be included in the summary of the public agency's annual energy consumption required under paragraph 1 of [subsection 25.35.2 \(3\)](#) of the *Act*.
2. Review of results from past plans
  - A description of the results of previous activities and measures to conserve the energy consumed by the public agency's prescribed operations and to otherwise reduce the amount of energy consumed by the public agency, including by employing such energy conservation and demand management methods as may be prescribed.
3. Implemented & proposed measures
  - The cost and saving estimates for the public agency's current and proposed activities and measures referred to in paragraph 2 of [subsection 25.35.2 \(3\)](#) of the *Act*.
  - The estimated length of time the public agency's current and proposed activities and measures referred to in paragraph 2 of [subsection 25.35.2 \(3\)](#) of the *Act* will be in place.



4. Goals & objectives
5. Renewable Energy
  - A description of any renewable energy generation facility operated by the public agency and the amount of energy produced on an annual basis by the facility.
  - A description of, the ground source energy utilized, if any, by ground source heat pump technology operated by the public agency, the solar energy utilized, if any, by thermal air technology or thermal water technology operated by the public agency, and the proposed plan, if any, to operate heat pump technology, thermal air technology or thermal water technology in the future.
6. Senior management approval
  - A confirmation that the energy conservation and demand management plan has been approved by the public agency's senior management.

For more information regarding O. Reg. 25/23 for the Broader Public Sector, [please visit the Ontario Government website.](#)

## 1.2.2 Municipal Mandate

Oxford County has demonstrated itself as a leader in identifying climate change as a key issue in today's society and has implemented numerous policies. In June 2015, County Council unanimously voted on setting a goal of 100% renewable energy by 2050, the first municipality in Ontario and second in Canada to do so. Since the implementation of the 100% RE (renewable energy) goal, the County has established the Zero Waste plan, which would see 90% waste diversion to extend the life of the current waste management site until 2100, an extension of over 56 years.

Other items include the first powered compressed natural gas (CNG) snow plows in Canada, and the Oxford County Waste Management & Education Centre (WMEC), as this facility was the second building in Ontario (and the first office type building in Canada) to receive the Zero Energy Building verification from the New Building Institute.

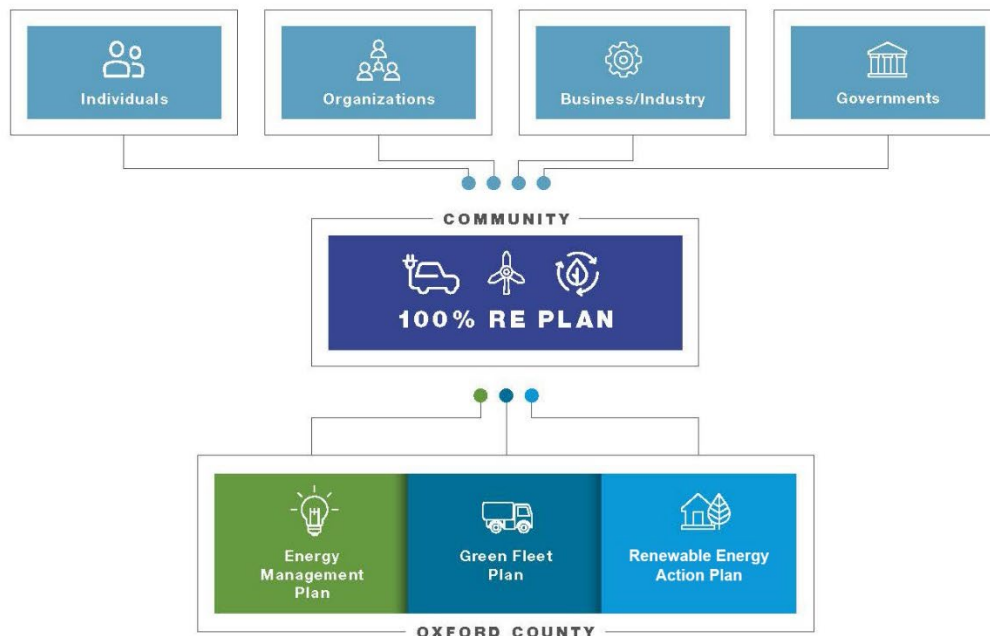
Below is a list of documents created by Oxford County or external documents that have significant influence on the County:

- [100% Renewable Energy Plan](#)
- [Zero Waste Plan](#)
- [Green Fleet Plan: 2021 - 2025](#)
- [Partners for Climate Protection \(PCP\) Protocol](#)
- [Renewable Energy Action Plan: 2022 - 2032](#)

The 100% RE goal by 2050 was followed up when County Council adopted the [100% RE Plan](#) on June 27, 2018, which lays out a strategic approach to achieving the goal of 100% RE by 2050. This initiative seeks to reduce energy consumption while at the same time increasing RE harvesting to achieve net-zero performance across the geographical County by the year 2050.

The 100% RE Plan is based on a community-wide initiative. The County organization is a major influencer on the potential achievement of the 100% RE Plan by corporately addressing the energy consumption and generation potential of the County’s facility and fleet portfolio, striving to be a leader within the community and demonstrate active support for this important community goal.

As shown in Figure 3 below, the 100% RE Plan has a number of contributor groups, including individual residents, organization groups, businesses residing in the community and governments, which include the area municipalities, as well as the County organization.



**Figure 3: 100% RE Plan Contributors**

Over the last number of years, Oxford County has set organizational goals to help advance the progress of the 2050 100% RE community goal. Of note, the County has developed and implemented various plans to drive efforts of energy conservation and RE harvesting as follows:

- **2019 Energy Management Plan** – On August 14, 2019, County Council approved Report [PW 2019-33](#), which outlined the County’s updated [Energy Management Plan](#) (EMP-2019) for 2019 through to the end of 2023. EMP-2019 is the second iteration of the County’s EMP, with the first being enacted in 2014. As required by provincial regulation O. Reg. 25/23, this EMP is required to be updated every five years, with the current update in July 2024. The focus of this plan is on energy conservation and GHG emission reductions.
- **2021-2025 Green Fleet Plan** – On June 9, 2021, County Council adopted Report [PW 2021-23](#), which outlined the County’s 2021-2025 [Green Fleet Plan](#) (GFP-2021) building off the former *2016 Green Fleet Plan*. This is the second iteration of the GFP and

specifically targets the reduction of GHG emissions through progressive transformation of the County’s fleet towards lower carbon alternative fuels and energy reduction.




- **2022-2032 Renewable Energy Action Plan** – On August 10, 2022, County Council approved Report [PW 2022-37](#), which outlined the County’s 10-year **Renewable Energy Action Plan** (REAP) for 2022 through to 2032. The REAP will expand upon the County’s existing renewable energy systems through a proposed multi-year capital implementation plan comprised of an additional solar PV system, geothermal / air source heat pump, heat recovery and wood pellet boiler technology applications. The focus of this plan is on RE harvesting and utilization, as well as energy conversion in order to progress towards the County’s 100% RE goals.

Management of energy and GHG emissions plays an integral role in reducing GHG emissions and energy consumption, improving energy efficiency, establishing financial stability and increasing RE harvesting. These plans provide a roadmap, along with actionable items required to meet the targets.

### 1.3 Relationship to Oxford County’s Strategic Plan

Oxford County Council approved the [2023-2026 Strategic Plan](#) on September 13, 2023. The Plan outlines 39 goals across three strategic pillars that advance Council’s vision of “Working together for a healthy, vibrant, and sustainable future.” These pillars are: (1) *Promoting community vitality*, (2) *Enhancing environmental sustainability*, and (3) *Fostering progressive government*.

The Energy Management Plan meets the County’s initiative as set out in the following sections of the strategic plan:

PILLAR 1	PILLAR 2	PILLAR 3
		
<b>Promoting community vitality</b>	<b>Enhancing environmental sustainability</b>	<b>Fostering progressive government</b>
<a href="#">Goal 1.2</a> Sustainable infrastructure and development	<a href="#">Goal 2.1</a> Climate change mitigation and adaptation	<a href="#">Goal 3.1</a> Continuous improvement and results-driven solutions  <a href="#">Goal 3.4</a> Financial sustainability

**Figure 4: Strategic Plan**

See: [Oxford County 2023-2026 Strategic Plan](#)

# 1.4 Scope

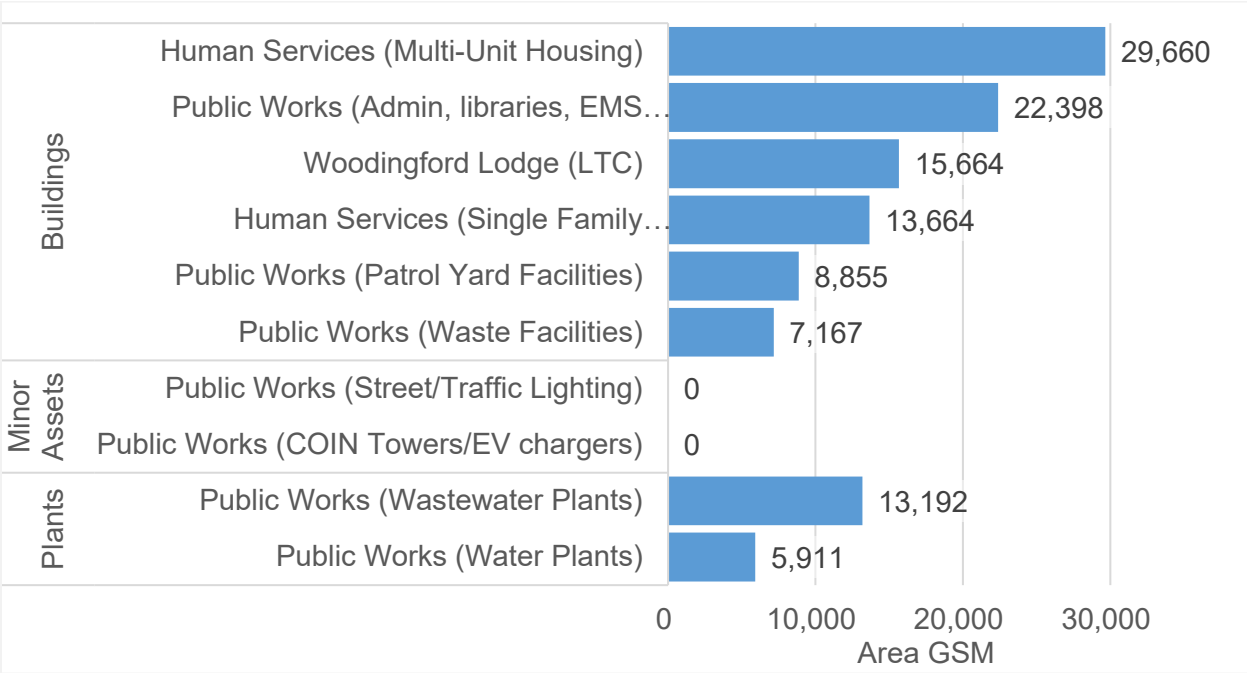
This Energy Management Plan (the “Plan”) pertains to the County’s facilities assets including, but not limited to those facilities meeting the criteria identified in the regulations. In addition, other non-facilities, energy related activities; such as fleet, renewable energy systems and biogas production, are included for information and coordination proposes.

## 1.4.1 Facilities Plan

Oxford County’s Engineering Services division currently maintains and operates 281 individual buildings across 245 facilities sites, which consume energy such as electricity, natural gas or propane as well as renewable energy, harvested by the County’s renewable energy systems. These facilities cover an approximate gross floor area (GFA) of 116,511 SM. The energy sources for these facilities come from five local distribution companies (LDCs) and covers 446 LDC metered accounts, and 14 Solar PV feed-in tariff accounts.

These facilities are broken into three main categories (Buildings, Minor Assets and Plants), and further organized by operation type to line up in general with O.Reg. 25/23 reporting requirements.

Refer to Figure 5 below for a summary of facilities, by Category and Operation Type, and associated area (gross square meters).



**Figure 5: Facilities Breakdown by Category and Type**

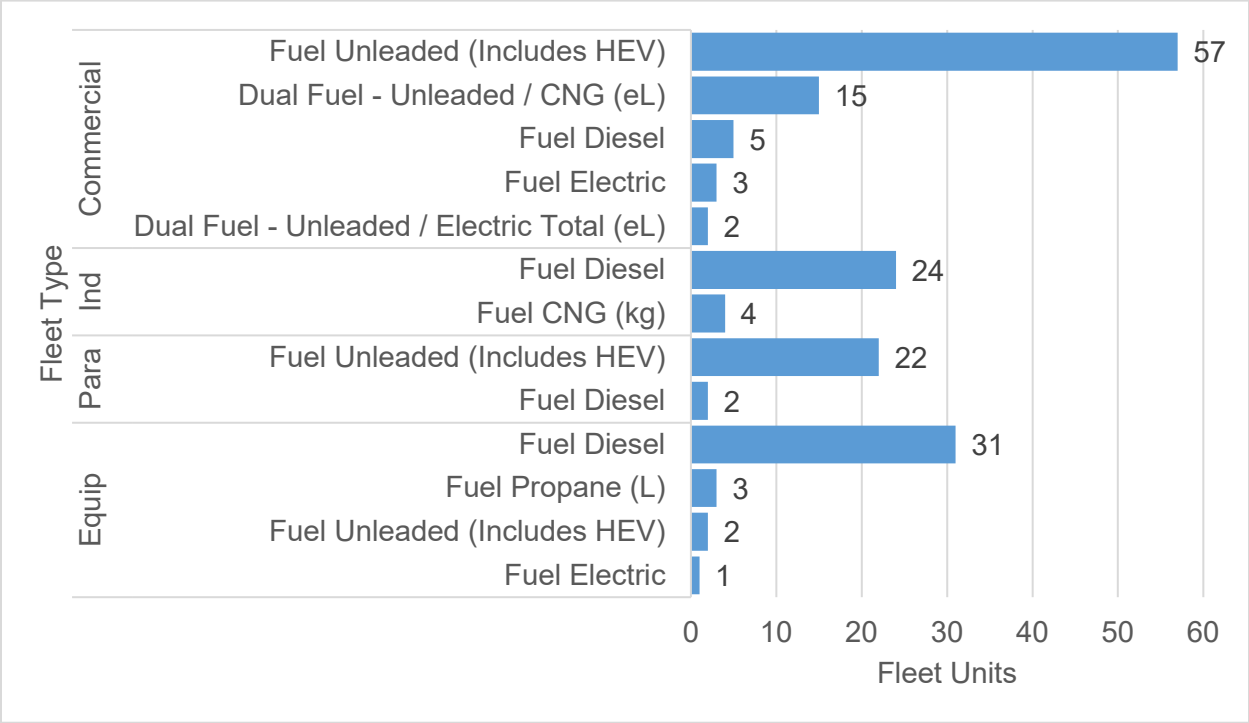
## 1.4.2 Non-Facilities Information

### 1.4.2.1 Fleet

As of the end of 2023, Oxford County maintained 171 Public Works and Paramedic Services fleet assets, of which 33% (56 out of 171) have been converted to alternative fuel sources to reduce energy consumption and GHG emissions. These assets can be organized into the following sub-categories (Fleet Types):

- Commercial (light-duty vehicles, cars, SUVs, etc.)
- Industrial (heavy vehicles, including plows, leachate trucks, vacuum trucks, tractors, etc.)
- Paramedical (ambulances, first response units, etc.)
- Equipment (all unlicensed, off-road vehicles including compactors, forklifts, etc.)

Figure 6 provides a breakdown of the County fleet by vehicle class, fuel type and number of units.



**Figure 6: Fleet Breakdown by Fleet and Fuel Type**

### 1.4.2.2 Renewable Energy Harvesting

The majority of the RE energy that is harvested across the County’s portfolio is utilized by County assets directly on the site where the system is located, with a smaller percentage of systems (i.e. FIT/micro-FIT systems) fully exporting RE back to the electrical grid generating revenue. In 2023, 3,550 eMWh were consumed on site, while 595 eMWh were exported back to the electrical grid. Overall, all RE produced is considered an offset to the total energy consumption needs of the County.

The County’s RE assets are divided into sub-categories based on technology type including biogas, ground source and air source heat pumps, solar PV (feed-in tariff and net-metered) and solar thermal. This is anticipated to expand in the future as new technologies emerge or are

implemented (i.e. biomass, wood pellet boiler, etc.). Refer to the *REAP-2022* for additional details.

Refer to Table 2 below, showing the overall portfolio production summarized for 2023.

**Table 2: County RE System Portfolio and Performance (2023)**

RE Harvesting Technology	Asset Count	Utilization Actuals 2023 (eMWh)
Solar PV (Feed-in-Tariff and Net-Metered)	22	1,917
Biogas (Ingersoll and Woodstock WWTPs)	2	2,092
Ground Source Heat Pump (Social Housing - 111 Brock Street)	1	138
Solar Thermal (Social Housing - 742 Pavey Street)	1	20
<b>Total</b>	<b>26</b>	<b>4,147</b>

### 1.4.2.3 Biogas Production

The County, through its waste management (landfill) and wastewater treatment activities, produces biogas in the form of landfill gas (LFG) and digester gas (DG).

The amount of biogas produced at the waste management site is based on estimates presented in annual reports provided by the County’s landfill gas consultant and included in an [Annual Monitoring Report](#). Of the LFG produced, a portion is collected and wasted to (Burned at) the flare on site, with the remainder being released to the atmosphere, as fugitive LFG. Total LFG flared is calculated based on flare run times, with the amount released to atmosphere estimated as the remainder from the total production.

The DG biogas produced in the wastewater digester process at the Woodstock and Ingersoll WWTP’s is collected and consumed in the boiler for digester process heat, with any excess sent to the flare on site. DG biogas sent to boiler and wasted to the flare at these sites are metered and tracked by staff. The remaining biogas produced, but not metered, and is categorized as fugitive DG.

County staff are exploring ways to more accurately estimate the total DG biogas being produced by using total treated waste water and emissions factors based on the characteristics of the wastewater being treated. This will allow the amount of fugitive DG to be estimated, based on the metered portion being subtracted from the total.

As the biogas for each process noted above are based on Oxford County community waste, the associated GHG emissions are not included in the County’s corporate energy and GHG emissions reports, or prior energy management plans. In part to meet milestones of the Partners for Climate Protection Protocol (PCP), data on energy and GHG emissions is included as information only. Additional data with respect to DG biogas, to be included in future plan updates.

## 2 GOALS & OBJECTIVES

Oxford County has established the 100% renewable energy goal by 2050 and has undergone an analysis of what is required to achieve this goal as a community. From a Corporate perspective, the County will align itself with the 100% RE goal by 2050 and outline the targets required to achieve that in this section. Furthermore, the short-term targets will be highlighted along with qualitative goals to be achieved by 2024.

### 2.1 Long Term Goals

The 100%RE Plan provides a roadmap for how 100% renewable energy by 2050 goal can be reached for the community as a whole. Using 2015 as a baseline this roadmap outlines the targets every five years until 2050.

Table 3 highlights the incremental targets and the ultimate end goals for energy and associated GHG emissions reductions. Based on the current projection targets, a **54% reduction of energy by 2050** is required to meet the 100% renewable target.

The County's corporate long term goals include Energy, Renewable Energy and GHG emissions from all County assets, including Facilities, Fleet and Renewable energy systems.

In 2020, the County's Facilities had a 0.7% reduction in energy but a 1.7% increase in GHG emissions over 2015 baseline. Without measures implemented, due to growth, the County would have consumed 13.9% more energy and emitted 18.1% more GHG emissions, than the 2015 baseline.

**Table 3: Oxford County's Energy & GHG Emissions Reduction Targets (2015 to 2050)**

Year	Target Reduction from 2015 baseline	
	Energy	GHG Emissions
2015	-	-
2020	1.7%	3.2%
2025	10.5%	14.1%
2030	19.3%	25.0%
2035	28.1%	36.0%
2040	36.8%	46.9%
2045	45.6%	57.8%
2050	54.4%	68.7%

Table 4 summarizes the energy mix required in order to reach the 100% renewable energy goal along with five year incremental targets. A major assumption is that approximately 20% of its energy from renewable sources can be purchased through [Ontario Electricity Grid](#). Therefore, Oxford County is aiming to close that gap by establishing a target of 80% renewable energy generated within Oxford County by 2050.

In 2020, the County's Facilities had a renewable energy mix of 4.2%, which is a 55% increase over 2015 baseline year renewable energy mix of 2.7%, however falls short of the 5.3% target for this same year. Without measures implemented, due to growth in energy consumption, the County's renewable energy mix would only be at 3.6%.

**Table 4: Energy Mix Targets (2015 to 2050)**

Year	Energy Mix Target		
	Non-Renewable	Renewable - Grid	Renewable - Oxford County
2015	-	-	-
2020	88.6%	6.1%	5.3%
2025	81.0%	7.3%	11.7%
2030	71.9%	8.7%	19.5%
2035	60.5%	10.4%	29.1%
2040	45.9%	12.7%	41.4%
2045	26.6%	15.6%	57.8%
2050	0.0%	19.7%	80.3%

## 2.2 Short Term Goals

Oxford County, as an organization (corporately), will align its short and long-term goals to reflect the Community goals detailed in Section 2.1. Given that the energy management plan requires updates every five years from 2014 onwards, all short-term goals will be interpolated for in-between years.

In the final year of this Plan (end of 2028), considering 2023 levels and an assumed 1% year-over-year increase due to growth, the County projects to have a 5.8% higher energy consumption and 1.1% reduction in GHG emissions over 2015 baseline with a renewable energy mix of 8.8%. Through implementing the measures proposed in this Plan, the energy consumption increase can be mitigated to a level of 2.2% above 2015 baseline and GHG emissions reductions improved to 10% below 2015 baseline, as well as a renewable energy mix improvement to 9.2%. Including measures identified in the *REAP-2022*, this renewable energy mix would see a further increase to 22%.

Table 5 provides a summary of the short-term targets and projections towards meeting these goals by 2028. The 2015 Adjusted Baseline takes into account organizational growth that has occurred since the original targets were set in 2015, and assumes the same energy efficiency levels have been carried through with no implemented mitigations.



**Table 5: 2028 Summary of Targets and Projections (2028)**

Description	Target by 2028	Projected (Plan Implemented) by 2028	
		Reduction (Over 2015)	Avoidance (Over 2015 Adjusted)
Energy Reduction from 2015 baseline of 46,307 eMWh	<b>15.4%</b> 7,131 eMWh	<b>-2.2%</b> -1,018 eMWh	<b>15.5%</b> 8,687 eMWh
GHG Emissions Reduction from 2015 baseline of 3,985 tCO <sup>2</sup> e	<b>11.9%</b> 474 tCO <sub>2</sub> e	<b>10%</b> 415 tCO <sub>2</sub>	<b>21%</b> 937 tCO <sub>2</sub> e
Renewable Energy Mix	<b>16.38%</b>	<b>9.2%</b> (22% including <i>REAP-2022</i> )	

# 3 BACKGROUND ENERGY INFORMATION

This section highlights a high level overview of Oxford County’s energy consumption, energy generation and GHG emissions, comparing baseline year 2015 to the year preceding the prior plan (2018), and that plan’s five-year term (2019 through 2023). This section is broken down by Facilities (i.e. Plan scope), and Non-Facilities (Fleet, RE Harvesting, and Biogas Production).

## 3.1 Facilities Energy and GHG

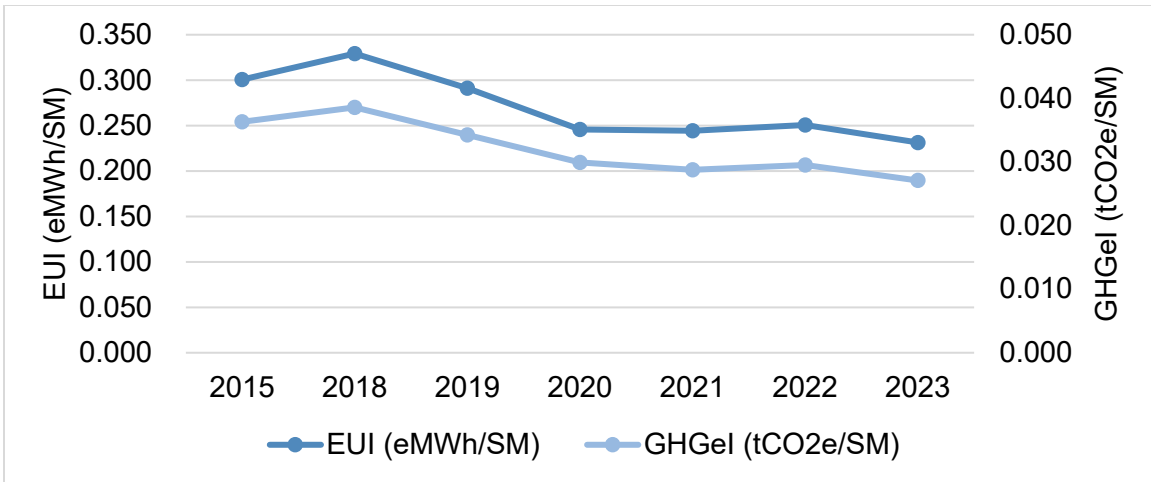
Table 6 summarizes all annual energy and GHG emissions data, for years noted. As of 2023 data, Oxford County has seen a 0.7% increase in overall energy and a 7.3% reduction in GHG emissions in its Facilities when compared with 2015 data. The average energy usage intensity (EUI) and GHG emissions intensity (GHG<sub>el</sub>) over this timeframe for Buildings and Plants are shown in Figure 7 and Figure 8, respectively.

The predicted energy consumption and GHG emissions for 2023, based on 2015 Adjusted Baseline (to 2023 variables including area and water treatment) are 53,305 eMWh and 4,288 tCO<sub>2e</sub> respectively.

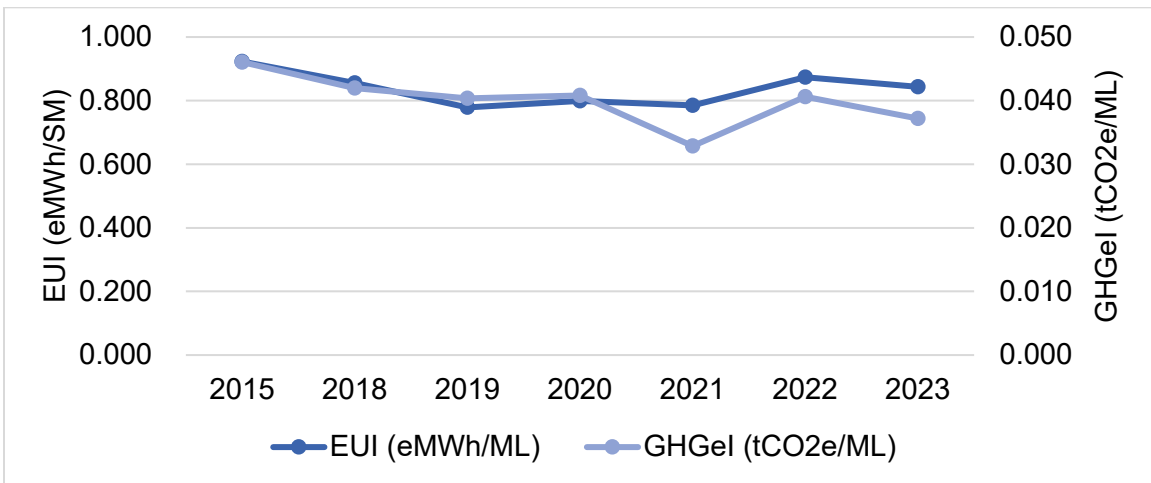
Refer to Appendix C: Facilities Historical Data, for a more detailed breakdown by year and operation type.

**Table 6: Summary of Facilities Energy GHG and RE Mix%**

Year	No. of Sites	Area (SM)	Water Treatment Flow (ML)	Energy (eMWh)	GHG Emissions (tCO <sub>2e</sub> )	RE Mix %
2015	168	95,515	24,948	46,307	3,946	2.7%
2018	135	93,479	25,825	46,729	3,969	4.6%
2019	135	93,479	26,936	42,780	3,648	3.8%
2020	233	114,324	28,251	46,248	4,013	4.2%
2021	236	114,324	28,226	45,706	3,679	8.1%
2022	229	115,137	27,659	48,476	3,967	6.6%
2023	245	116,511	28,228	46,629	3,694	7.6%



**Figure 7: Buildings Energy Usage and GHG Emission Intensity**



**Figure 8: Plant Energy Usage and GHG Emission Intensity**

## 3.2 Non-Facilities Energy and GHG Activities

### 3.2.1 Fleet Summary

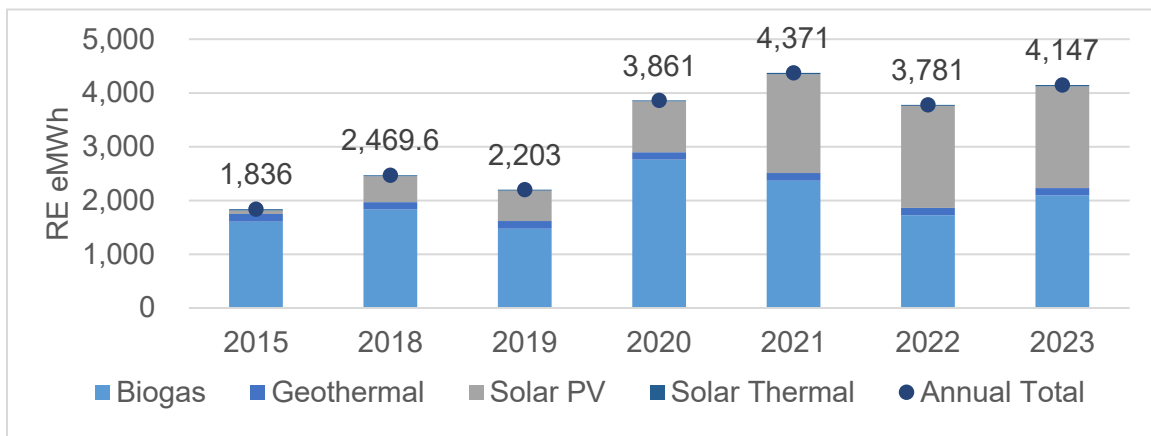
Table 7 summarizes the kilometers travelled, equivalent energy consumed, and GHG emissions for County fleet for the years noted. As of 2023 data, Oxford County has seen a 16.3% decrease in overall energy and an 18.1% reduction in GHG emissions in its fleet when compared with 2015 data.

**Table 7: Summary of Fleet Energy & GHG (2015 to 2023)**

Year	KMs Travelled	Energy (eMWh)	GHG (tCO2e)	EUI (eMWh/100 km)	GHGeI (tCO2e/100 km)
2015	2,735,997	8,920	2,239	0.326	0.082
2018	2,734,941	9,450	2,328	0.346	0.085
2019	2,904,750	8,274	2,033	0.285	0.070
2020	3,092,986	8,088	1,987	0.261	0.064
2021	2,393,324	8,330	2,044	0.348	0.085
2022	2,919,952	8,858	2,175	0.303	0.074
2023	2,797,697	7,458	1,833	0.267	0.066

### 3.2.2 Renewable Energy Harvesting Summary

Figure 9 below shows the County’s RE harvesting trend over the years noted. As of 2023 data, Oxford County has seen a 125% increase in overall renewable energy harvested, when compared with 2015 data.



**Figure 9: RE Harvesting Trending (2015 and 2018 to 2023)**

### 3.2.3 Biogas Production Summary

This section provides an inventory of the biogas produced at County managed landfill and wastewater treatment sites. The biogas from landfill is identified as landfill gas or LFG, and the biogas from the wastewater treatment process is identified as digester gas or DG. As the biogas is a product of waste generated by the community, it is not counted towards the County’s Corporate GHG emissions, but rather counted as part of the County’s Community GHG emissions. Being this biogas production and potential release to the environment is managed by the County, the following data is included in this Plan for RE harvesting and GHG emissions mitigation potential.

As methane released from biogas is greatly reduced during the combustion process (99.9% destruction rate), GHG emissions from biogas can be greatly reduced by either harvesting or flaring. The CO<sub>2</sub> portion that is released in the biogas (from combusted methane and other sources as a result of the digestion process) is considered biogenic, and is therefore not counted towards the GHG emissions total, however the methane that is not destroyed is considered anthropogenic, and therefore counted for its global warming potential in GHG emission (tCO<sub>2</sub>e).

In addition to GHG emission, the biogas produced contains energy that can be harvested for its energy potential. The biogas currently utilized by the County for its energy is included in the “Renewable Energy Harvesting” section, whereas the biogas that is not utilized (i.e. flared or fugitive) is noted for its energy potential and GHG emissions in this section.

The total biogas production for DG is estimated based on emission factors for methane produced per volume of treated wastewater, and methane content per volume of DG. Biogas production for LFG is based on modelling provided by the County’s LFG flare management consultant. The values related to fugitive biogas are the balance of total biogas estimated minus biogas utilized or flared. Due to technical issues, monitoring for Utilized and Flared DG biogas in 2018 was not accurate, and therefore has been estimated based on baseline data.

See Table 8, Table 9 below summarize trend estimates of biogas produced and associate GHG emissions (tCO<sub>2</sub>) and energy, respectively.

**Table 8: Trend of Biogas Production**

Year	Volume Total Biogas (ML)			
	Harvested	Flared	Fugitive	Total
2015	259	2,540	9,613	12,412
2018	295	2,092	9,968	12,355
2019	238	1,889	10,153	12,280
2020	226	1,668	10,501	12,395
2021	382	1,149	10,925	12,455
2022	277	1,070	11,227	12,575
2023	337	992	11,503	12,831
Estimated				

**Table 9: Trend of Biogas GHG Emissions and Energy**

Year	GHG (tCO <sub>2</sub> e) Harvested or Flared			Energy (eMWh)		
	Harvested and Flared	Fugitive	Total	Harvested	Potential (Flared and Fugitive)	Total
2015	327	112,456	112,784	1,608	75,472	77,081
2018	279	116,609	116,889	1,832	74,893	76,725
2019	249	118,768	119,017	1,478	74,780	76,258
2020	222	122,846	123,068	1,403	75,572	76,974
2021	179	127,798	127,977	2,370	74,977	77,347
2022	158	131,334	131,492	1,722	76,366	78,089
2023	155	134,561	134,716	2,092	77,591	79,683
Estimated						

### 3.3 Energy Consumption Summary

Table 10 summarizes the Corporate (facilities and fleet) energy consumption from non-renewable and renewable sources, for baseline year 2015, and 2018, with the last plan term 2019-2023.

**Table 10: Summary of Corporate Energy Consumption**

Year	Facilities (eMWh)			Fleet (eMWh)	Combined (eMWh)		
	Non-renewable	Renewable	Total	Non-renewable	Non-renewable	Renewable	Total
2015	44,541	1,766	46,307	8,920	53,461	1,766	55,227
2018	44,953	1,776	46,729	9,450	54,403	1,776	56,179
2019	40,916	1,734	42,650	8,274	49,190	1,734	50,924
2020	44,262	1,737	45,999	8,088	52,350	1,737	54,087
2021	42,761	3,669	46,430	8,330	51,091	3,669	54,760
2022	45,070	3,119	48,190	8,858	53,928	3,119	57,047
2023	43,077	3,552	46,629	7,458	50,535	3,552	54,087

### 3.4 GHG Emissions Summary

Table 11 summarizes the Corporate (facilities and fleet) and Biogas GHG emissions for baseline year 2015, and 2018, with the last plan term 2019-2023.

**Table 11: Summary of the GHG Emissions (2015 to 2023)**

Year	Corporate Emissions (tCO <sub>2</sub> e)			Corporately Managed Biogas Emissions (tCO <sub>2</sub> )
	Facilities	Fleet	Corporate Total	
2015	3,985	2,239	6,223	112,784
2018	3,969	2,328	6,297	116,889
2019	3,686	2,033	5,719	119,017
2020	3,844	1,987	5,831	123,068
2021	3,716	2,044	5,761	127,977
2022	4,173	2,175	6,348	131,492
2023	3,694	1,833	5,527	134,716
Estimated				

## 4 PAST PLAN RESULTS

This section provides a review since the last Plan update. In 2019, Oxford County published an updated energy management plan that outlined numerous goals, objectives and strategies to reduce energy and GHG emissions. Each main goal is reflected upon below outlining achievements.

### 4.1 Energy Measures Results

As of December 31, 2023, projects completed as part of EMP-2019 are estimated to have avoided 270 eMWh in total net-energy (263 MWh of electricity and 623 m<sup>3</sup> of natural gas). An additional 89 eMWh of avoidances were added to this from projects identified in addition to the plan, for a total of 359 eMWh in net-energy avoidance.

The measure with the biggest energy avoidance came from the Interior Lighting Retrofit project at the Oxford County Administration building, with avoidances of nearly 135 eMWh. A total of 12 projects contributed to these annual avoidances.

There are ten projects currently in progress for completion in 2024 which are anticipated to add an additional 517 eMWh in net-energy avoidances (193 MWh of electricity and 31,316 m<sup>3</sup> of natural gas), with an additional two projects slated to commence in 2025, adding an additional 597 eMWh in net-energy avoidances.

In all, planned (EMP-2019) and unplanned initiatives that are completed, in progress or in planning as of 2023, project to produce 1,473 eMWh in net-energy avoidance.

Table 12 below provides summary of facilities energy conservation measures, by year and status, since the last plan update. Refer to proposed measures and *EMP-2019* for details.

**Table 12: Summary of Measures, Energy and GHG Impact**

Status	Year	Net-Energy Avoided (eMWh)	GHG Emissions Avoided (tCO <sub>2</sub> e/yr)
Completed	2019	91.7	2
	2020	-	-
	2021	134.8	3
	2022	49.0	2
	2023	83.9	(1)
Completed Sub-Total		359.4	8
Execution	2024	517.6	64
Planning	2025	597.0	100
Pending Sub-Total		1,114.6	164
Total		1,474.3	113

For a more detailed summary of the measures, please refer to Appendix A: Summary of Prior Plan Measures.



## 4.2 Energy Activities Results

In addition to the measures implemented, several energy management activities were undertaken. See Table 13 below for a list of energy management activities undertaken since the last plan update.

**Table 13: Energy Activities**

Initiative	Status	Comments
Solar PV maintenance contract	Complete	In 2020, the County secured its first three-year solar PV maintenance agreement for all County Solar PV systems, and is currently in a new three-year term (2023-2025). Budget and projections for future maintenance on existing and new systems are included in the County's capital plan.
Long Term Renewable Energy Plan	Complete	In 2022, County staff developed and received Council approval on its first long term renewable energy plan, identified as the Renewable Energy Action Plan (REAP). This 10-year plan provides a road map for renewable energy initiatives and funding requirements up to year 2032.
Examine alternative fuels for fleet	Complete	In 2021, County staff received Council approval on its 2 <sup>nd</sup> iteration of the Green Fleet Plan (GFP). This plan provides a roadmap to move County fleet towards alternative fuels.
Adjust energy baseline of 2015 to align with PCP Protocol and record all necessary forms of energy and relevant data from 2017 onwards	In Progress	In Progress. This goal will be deemed accomplished if staff complete the inventory of GHG emissions for 2015 and become compliant with the PCP Protocol.  Data is missing for fleet and biogas in 2015 based on the scope of the PCP Protocol. Staff will need to review paper utilities as some of this information is no longer available online or was recorded in paper entirely.  County staff are proposing to complete an assessment of requirements to adhere to the PCP protocol, targeting completion in 2025.
Form an energy committee	In Progress	As of 2023, the terms of reference for this team has been developed, which provides details on structure, as well as meeting frequency, with first meeting is targeted in 2024.
Annual group of energy assessments	In Progress	As of 2023, a total of 10 sites have been assessed, including two sites in 2020, five sites in 2022 and three sites in 2023. An additional five sites are planned for 2024.

Initiative	Status	Comments
Benchmarking all buildings	Complete	As of 2023, all buildings have been added to RETScreen portfolio manager. RETScreen allows the buildings energy to be compared with a benchmark. In addition, all buildings' energy data was added to Energy Star portfolio which benchmarks all buildings.
Reduce energy & GHG emissions reporting gap from two years to one fiscal quarter	Complete	As of 2023, all utility bills are captured on the County's utility bill management software service. Bills are added within two or three months of the reporting period which allows reporting of associated GHG emissions possible within one quarter.
Improve software monitoring of all building meters from 80% of the County's consumption to 95%	Complete	As of 2023, all utility bill meters are captured on the County's utility bill management software. This includes all accounts with a meter, but excludes smaller accounts, such as street lighting and traffic signals. Staff have determined that monitoring of all meters is not financially beneficial due to the cost to implement versus the benefit of monitoring the consumption.
Create an annual energy campaign	In Progress	County staff are investigating potential campaigns to offer on an annual basis. Targeting roll out of first campaign in the fall of 2024.
Develop baseline models of top ten sites	Complete	As of 2023, baseline models of at least 10 buildings have been determined on RETScreen, which imports data automatically from the County's utility bill management software service, and using regression analysis compares energy usage versus weather and other variables.
Annual progress reports to County Council	Complete	In 2023, the first Annual Energy Report, for the reporting year 2022 was completed and received by County Council, followed by the 2023 Annual Energy report completed in 2024.
Increase number of sub-metered buildings to ten	In Progress	Oxford County currently has two sub-metered buildings (Waste Management and Education Centre, Oxford County Administration Building). As of 2023, a project to implement sub-metering of seven buildings commenced which is targeting completion in 2024.

# 5 PROPOSED PLAN

This section will summarize proposed energy management opportunities (EMOs), including measures and activities, in this Plan to reduce the County’s dependence on non-renewable sources (net- energy), specifically related to Facilities.

## 5.1 Energy Measures

The energy measures proposed in this Plan over the next five years will progress the County towards the proposed short-term targets of 15.4% reduction in energy and 11.9% reduction in GHG emissions over 2015 baseline levels by 2028. These measures are projected to reduce net-energy and GHG emissions by 2,430 eMWh and 334 tCO<sub>2</sub>e, which correlate to a 4.4% and 5.3% for net-energy and GHG emissions respectively, over 2015 baseline. Net-energy includes energy reduced in addition to renewable energy harvested.

Heating optimizations through the use of air source heat pump technology is projected to be the largest contributor to energy reductions included in this plan, at about 33%, with existing building commissioning (EBCx) of buildings, which effectively reduce waste energy usage and right sizing the selected facilities, being a close second at about 31%.

Refer to Table 14 and Table 15 below for a summary of Energy and GHG impact, by measure type and year, respectively.

For a detailed summary of each measure, please refer to Appendix B: Summary of Proposed Measures.

**Table 14: Energy and GHG Impact by Measure Type**

Measure Type	Energy Reduction (eMWh)	RE Harvested (eMWh)	Net-Energy (eMWh)	GHG Reduction (tCO <sub>2</sub> e)
Air Source Heat Pump (ASHP)	203	587	790	135
Existing Building Cx (EBCx)	749	0	749	53
Water Conservation	210	0	210	36
Bioenergy Harvesting	25	173	198	32
Building Envelop Upgrades	164	0	164	25
Monitoring Based Cx (MBCx)	151	0	151	7
Lighting Upgrades	76	0	76	(1)
Demand Control	61	0	61	4
Electrification Fuel Switching	14	0	14	42

Measure Type	Energy Reduction (eMWh)	RE Harvested (eMWh)	Net-Energy (eMWh)	GHG Reduction (tCO2e)
Process and Equipment Optimization	11	0	11	-
HVAC Upgrades	5	0	5	1
<b>Grand Total</b>	<b>1,670</b>	<b>760</b>	<b>2,430</b>	<b>334</b>

**Table 15: Energy and GHG Impact by Year**

Year	Energy Avoidance (eMWh)	RE Harvested (eMWh)	Net-Energy (eMWh)	GHG Reduction (tCO2e)
2024	51	80	131	26
2025	366	337	703	96
2026	353	344	697	106
2027	351	0	351	28
2028	549	0	549	79
<b>Total</b>	<b>1,670</b>	<b>760</b>	<b>2,430</b>	<b>334</b>

## 5.2 Energy Activities

In addition to the short-term quantitative goals, there are also qualitative goals that will indirectly assist in achieving the overall quantitative goals. Each goal is detailed below along with the total implementation budget over the five-year period and target completion year. Some goals, such as the monitoring based commissioning (MBCx) and sub-metering, will have ongoing operational costs.

<b>Annual energy campaign</b>
<b>Target Completion:</b> 2024-2028
<b>Total Implementation Budget:</b> \$27,500 (\$5,500 per year over five years)

**Priority:** Medium

Oxford County has numerous events dedicated to a wide range of topics to engage employees. The idea is to create a challenge amongst employees by monitoring energy consumption during a time period and then comparing it to what was expected to be consumed during that time period respectively. This approach can be scalable from departments to whole buildings. The plan would be to host a campaign once a year.

This goal will be deemed accomplished if a pilot campaign is launched by 2024.

### **Baseline Modelling**

**Target Completion:** 2025

**Total Implementation Budget:** \$6,000

**Priority:** Low

The objective is to create energy models of thirty additional buildings through software, such as RETScreen Expert. By developing models, it can aid in identifying energy savings and also energy avoidance. Other uses are predicting energy consumption which can complement projects, such as the energy campaign. The ten buildings will be the top energy consumers owned by the County.

This goal will be deemed accomplished if thirty additional buildings are modeled by 2025.

### **Solar PV Systems Monitoring Based Commissioning**

**Target Completion:** 2025

**Total Implementation Budget:** \$90,000

**Priority:** Medium

Monitoring-Based Commissioning (MBCx) is a process which improves operational efficiencies, by ensuring that the Solar PV system operates at optimal levels, by actively monitoring generation and identifying anomalies, so that early action can be determined to address the issues.

This goal will be deemed accomplished if the solar PV sites have a monitoring based commissioning system in place by 2025.

### Participate in Strategic Energy Management (SEM) program

**Target Completion:** 2026

**Total Implementation Budget:** Staff Time

**Priority:** High

The County has received approval to participate in a municipal based cohort, in the IESO's Strategic Energy Management (SEM) program, commencing in 2024. Over the 24-month timeframe, this cohort will help strengthen the County's corporate capacity for energy management, including building skills among staff, coaching for regular energy team meetings, and documented support of SEM from senior management. This foundation will provide additional capabilities for staff to identify and prioritize energy savings opportunities. Performance will be monitored using an energy performance model, allowing staff to maintain course toward our long term goals and incremental targets.

This goal will be deemed accomplished when County staff complete the milestones identified in the SEM program in 2026.

### Annual energy assessments

**Target Completion:** 2028

**Total Implementation Budget:** \$78,000

**Priority:** Medium

Energy assessments can assist staff in identifying Energy Efficiency Measures/Energy Conservation Measures (EEMs/ECMs) and providing key attributes that can determine if the project is viable (e.g. energy savings, budget and financial analysis). In addition, this initiative will help identify additional opportunities/projects to proactively contribute to the next EMP update.

This goal will be deemed accomplished if a minimum of two sites per year are assessed.

### Sub-meter additional buildings

**Target Completion:** 2028

**Total Implementation Budget:** \$227,000

**Priority:** Low

The goal for this initiative is to implement between one to two additional sub-metering projects per year. Sub-metering can further assist energy staff in identifying energy savings and load

shifting. In addition, it can be used for employee engagement through contests and simply displaying the information at a central location (e.g. dashboard in lobby).

This goal will be deemed accomplished if eight additional buildings have sub-metering by 2028.

## 5.3 Financial

### 5.3.1 Capital Costs Energy Consumption Plan

To date, the County has been attempting to invest approximately \$350,000 per year in energy conservation and demand management. In an effort to align with the larger community goal, this Plan builds on past investments and considering that low hanging fruit has been targeted, this Plan proposes almost triple the investment in green initiatives to an average of about \$1 million per year, for a total of just over \$5.2 million over Plan’s five-year life.

Incentives (grant funding of around \$1 million) have been secured for initiatives currently included in the capital plan. Staff will attempt to further mitigate capital costs by obtaining additional incentives and/or grants where available. The goal will be to only implement projects that are financially viable and to maintain a positive simple payback for all projects combined. The implementation of this plan is subject to annual budget and business plan approval.

Table 16 outlines the estimated annual capital requirements, along with possible operational cost benefits to implement the above-noted projects. All capital costs are shown as present value, and future project costs will be validated through the design phases and updated with current costing for annual budget approvals.

**Table 16: Annual Financial Impacts**

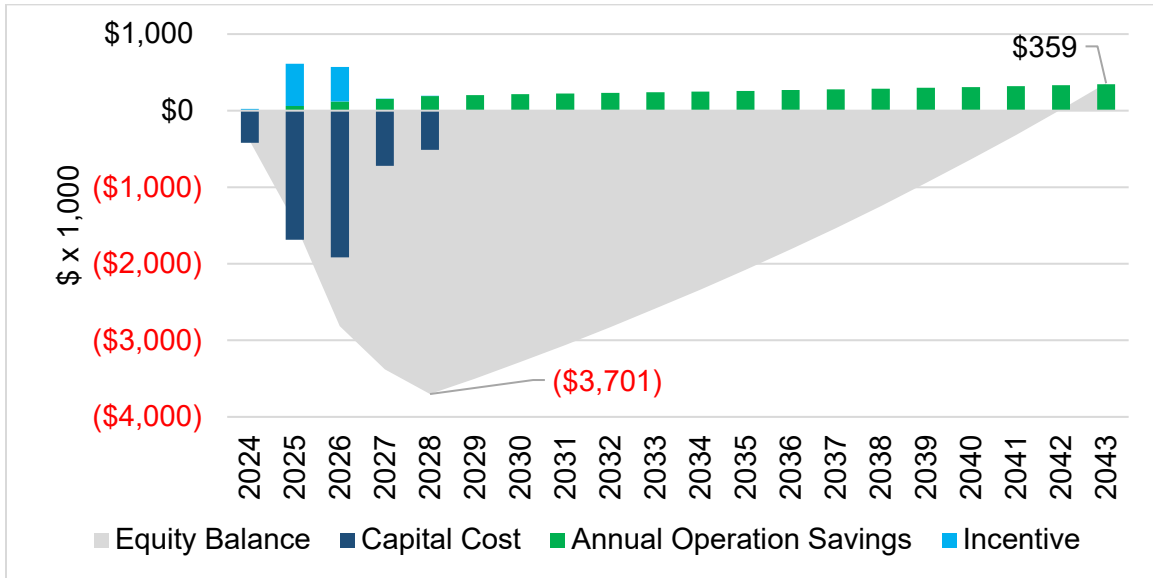
Year	Capital Cost	Potential Incentive	Annual Operational Avoidance
2024	\$419,400	\$19,200	\$4,420
2025	\$1,687,340	\$552,840	\$55,000
2026	\$1,914,460	\$451,520	\$58,380
2027	\$722,560	\$3,330	\$36,730
2028	\$513,260	\$330	\$37,690
Plan Total	\$5,257,020	\$1,027,220	\$192,220

### 5.3.2 Return on Investment

Overall, the projects identified in this Plan will cost just over \$5.2 million. The operational cost avoidances are projected to be just under \$5 million. Operational cost avoidance is the sum of each year’s future value annual cash flow balance (avoided utilities costs plus increased maintenance costs factoring in increases due to inflation and carbon tax impacts) to 2043 (fifteen years after plans completion). In addition, the approximately \$1 million in incentives has been accounted for, to offset capital costs.

Overall, this Plan will result in a positive equity balance of just under \$359,000 by year 2043, when including incentives. The measures as a whole, will pay for themselves within fifteen years after the Plan's completion (considering incentives), which is within the projects' average useful life.

Refer to Figure 10 below, for Equity balance of the projects including estimated incentives.



**Figure 10: Equity Balance (with Incentives)**



## 6 SUMMARY

Overall, Oxford County continues to make strides toward meeting its short-term goals with respect to avoided energy and GHG emissions reductions, and continues its path to 100% renewable energy by 2050.

As of end of year 2023, the County's Facilities renewable energy mix was 7.6%, of the total 46,629 eMWh energy consumption. Although energy consumption increased by 0.7% in 2023 from 2015 level of 46,307 eMWh, considering growth of about 15% during this span, energy avoidances achieved are around 12.5% (6,676 eMWh) when comparing actuals with 2015 Adjusted Baseline. These avoidances have been achieved through the implementation of energy initiatives as part of the prior Energy Management Plan and Renewable Energy Action Plan.

By end of year 2028, following the implementation of the initiatives identified in this Plan, the annual consumption is expected to be at 47,337 eMWh, which would be an increase of 2.2% over 2015 levels. Considering an year-over-year growth of 1% commencing in 2023, this would represent an energy avoidance of 15.5% (8,687 eMWh) over 2028 projections, of which 2.9% (1,670 eMWh) is related to this Plan.

Compared with targets reductions of 6.9% by 2023 and 15.4% by 2028 respectively, these initiatives project to result in avoidances in line with the targets reductions; however, additional effort will be required in future years to reduce energy consumption and overcome projected growth.

## 7 APPROVAL

The implementation of this plan is subject to annual Business Plan and Budget approval.

To be updated pending Council approval.

# APPENDIX A: SUMMARY OF PRIOR PLAN MEASURES

Table 17: Completed or In-progress Measures

Year	Description	Annual Projected Savings						Financial Estimates			Simple Payback Period (Yr.)	Estimated Life Span (Yr.)
		Energy (eMWh)	Renewable Energy Harvested (eMWh)	Net-Energy (eMWh)	Demand Reduction (kW)	Operation Cost	GHG Emissions	Capital Cost	Incentive	Planned Estimated Cost		
2019	LED Lighting Upgrade 195 Admiral St	66	0	66	0	\$9,520	2	\$65,600	\$0	\$65,600	6.9	20.0
	Lighting Controls 195 Admiral St	26	0	26	0	\$3,770	1	\$10,000	\$0	\$10,000	2.7	20.0
2019 Total		92	0	92	0	\$13,300	2	\$75,600	\$0	\$75,600	5.7	20.0
2020	Cogeneration Investigation 300 Juliana Drive	0	0	0	0	\$0	0	\$5,000	\$0	\$5,000	N/A	7.0
	Energy Assessments - 325 Thames, 161 Fyfe 325 Thames Street S   161 Fyfe Ave	0	0	0	0	\$0	0	\$9,480	\$0	\$9,480	N/A	7.0
	Solar PV Maintenance Various OC Sites	0	0	0	0	\$0	0	\$15,000	\$0	\$15,000	N/A	20.0
2020 Total		0	0	0	0	\$0	0	\$29,480	\$0	\$29,480	N/A	11.3
2021	Energy Monitoring Enhancements N/A	0	0	0	0	\$0	0	\$25,000	\$0	\$25,000	N/A	7.0
	Solar PV Maintenance Various OC Sites	0	0	0	0	\$0	0	\$20,900	\$0	\$20,900	N/A	20.0
	Emergency Light Scheduling 21 Reeve St	29	0	29	0	\$4,190	1	\$17,200	\$0	\$17,200	4.1	20.0
	Idling reduction technology 5 Snow Plows	0	0	0	0	\$0	0	\$37,500	\$0	\$37,500	N/A	7.0
	Interior Lighting Control Improvements 21 Reeve St	4	0	4	0	\$530	0	\$2,700	\$0	\$2,700	5.1	20.0
	Interior Lighting Retrofit 21 Reeve St	102	0	102	0	\$14,840	3	\$102,300	\$0	\$102,300	6.9	20.0
2021 Total		135	0	135	0	\$19,550	3	\$205,600	\$0	\$205,600	10.5	15.7
2022	Energy Assessments - 56 McKeand, 52 Venison 56 Mckeand St   52 Venison Street W	0	0	0	0	\$0	0	\$12,620	\$0	\$12,620	N/A	7.0
	Energy Assessments - Earl, George, Maria 178 Earl St   16 George St   70 Maria St	0	0	0	0	\$0	0	\$12,500	\$0	\$12,500	N/A	7.0
	392000 WFL Ingersoll BAS Optimization 325 Thames Street S	39	0	39	9	\$5,600	1	\$15,000	\$0	\$15,000	2.7	15.0
	ERV Control Optimization 415 Hunter St	10	0	10	0	\$850	1	\$2,000	\$0	\$2,000	2.4	15.0
	Solar PV Maintenance Various OC Sites	0	0	0	0	\$0	0	\$29,000	\$0	\$29,000	N/A	20.0
	Idling reduction technology 5 Snow Plows	0	0	0	0	\$0	0	\$31,000	\$0	\$31,000	N/A	7.0
2022 Total		49	0	49	9	\$6,450	2	\$102,120	\$0	\$102,120	15.8	11.8
2023	Baseline Modeling 5 Buildings	0	0	0	0	\$0	0	\$1,000	\$0	\$1,000	N/A	0.0
	Energy Assessments - Finkle, Rolph & Carroll 82 Finkle St   57 Rolph St   135 Carroll St	0	0	0	0	\$0	0	\$12,380	\$0	\$12,380	N/A	7.0
	Vacancy Sensors 81 King Street	2	0	2	0	\$270	0	\$1,000	\$0	\$1,000	3.7	15.0
	Solar PV Maintenance Various OC Sites	0	0	0	0	\$0	0	\$32,000	\$0	\$32,000	N/A	20.0
	3 - 381 William Street South, Tavistock, ON Replace all lighting on interior and exterior of building with LED lighting. 3 - 381 William Street South	0	0	0	0	\$0	0	\$1,400	\$0	\$1,400	N/A	20.0
	441 Beards Lane Replace all lighting on interior and exterior of building with LED lighting. 441 Beard's Lane	0	0	0	0	\$0	0	\$900	\$0	\$900	N/A	20.0

Year	Description	Annual Projected Savings						Financial Estimates			Simple Payback Period (Yr.)	Estimated Life Span (Yr.)
		Energy (eMWh)	Renewable Energy Harvested (eMWh)	Net-Energy (eMWh)	Demand Reduction (kW)	Operation Cost	GHG Emissions	Capital Cost	Incentive	Planned Estimated Cost		
	800 Lansdowne Ave, Woodstock, ON Replace all lighting on interior and exterior of building with LED lighting. 800 Lansdowne Ave	0	0	0	0	\$0	0	\$900	\$0	\$900	N/A	20.0
	Idling reduction technology 5 Snow Plows	0	0	0	0	\$0	0	\$31,000	\$0	\$31,000	N/A	7.0
	LED Lighting Upgrade 161 Fyfe Ave	51	0	51	0	\$9,150	(1)	\$48,390	\$3,490	\$44,900	4.9	20.0
	LED Lighting Upgrade 56 Mckeand St	4	0	4	1	\$640	0	\$32,190	\$0	\$32,190	50.3	20.0
	LED Lighting Upgrade 81 King Street	12	0	12	0	\$1,690	0	\$19,630	\$1,060	\$18,570	11.0	20.0
	LED Lighting Upgrade Various Locations (water sites)	15	0	15	0	\$2,180	0	\$61,260	\$800	\$60,460	27.7	20.0
<b>2023 Total</b>		<b>84</b>	<b>0</b>	<b>84</b>	<b>1</b>	<b>\$13,920</b>	<b>(1)</b>	<b>\$242,050</b>	<b>\$5,350</b>	<b>\$236,700</b>	<b>17.0</b>	<b>15.8</b>
2024	Baseline Modeling TBD - 5 Buildings	0	0	0	0	\$0	0	\$1,000	\$0	\$1,000	N/A	0.0
	Retro-commissioning - OCAB 21 Reeve St	52	0	52	0	\$4,630	6	\$70,000	\$0	\$70,000	15.1	7.0
	Retro-commissioning 300 Juliana Drive	348	0	348	0	\$25,720	47	\$100,000	\$0	\$100,000	3.9	7.0
	Sub-metering - 161 Fyfe Ave 161 Fyfe Ave	5	0	5	0	(\$70)	0	\$10,000	\$0	\$10,000	(142.9)	7.0
	Sub-metering - 195 Admiral St 195 Admiral St	27	0	27	0	\$3,170	1	\$15,000	\$0	\$15,000	4.7	7.0
	Sub-metering - 300 Juliana Drive 300 Juliana Drive	57	0	57	0	\$3,380	8	\$15,000	\$0	\$15,000	4.4	7.0
	Sub-metering - 325 Thames Street S 325 Thames Street S	14	0	14	0	\$300	2	\$15,000	\$0	\$15,000	50.0	7.0
	Sub-metering - 52 Venison Street W 52 Venison Street W	12	0	12	0	\$250	1	\$15,000	\$0	\$15,000	60.0	7.0
	Sub-metering - 742 Pavey St 742 Pavey St	3	0	3	0	(\$340)	0	\$10,000	\$0	\$10,000	(29.4)	7.0
	Sub-metering 515165 11th Line County Road 30	1	0	1	0	(\$660)	0	\$7,000	\$0	\$7,000	(10.6)	7.0
	Solar PV Maintenance Various OC Sites	0	0	0	0	\$0	0	\$35,000	\$0	\$35,000	N/A	20.0
<b>2024 Total</b>		<b>518</b>	<b>0</b>	<b>518</b>	<b>0</b>	<b>\$36,380</b>	<b>64</b>	<b>\$293,000</b>	<b>\$0</b>	<b>\$293,000</b>	<b>8.1</b>	<b>7.5</b>
<b>Grand Total</b>		<b>877</b>	<b>0</b>	<b>877</b>	<b>10</b>	<b>\$89,590</b>	<b>72</b>	<b>\$947,850</b>	<b>\$5,350</b>	<b>\$942,500</b>	<b>10.5</b>	<b>12.8</b>

Table 18: Pending Measures

Year	Description	Annual Projected Savings						Financial Estimates			Simple Payback Period (Yr.)	Estimated Life Span (Yr.)
		Energy (eMWh)	Renewable Energy Harvested (eMWh)	Net-Energy (eMWh)	Demand Reduction (kW)	Operation Cost	GHG Emissions	Capital Cost	Incentive	Planned Estimated Cost		
2024	Energy Assessments - 5 Locations TBD - 19 Van Street   381 William Street South   10 Middleton St   174 Lisgar Ave   215 Lisgar Ave	0	0	0	0	\$0	0	\$16,500	\$0	\$16,500	N/A	7.0
	Energy Campaign TBD	0	0	0	0	\$0	0	\$5,000	\$0	\$5,000	N/A	0.0
	Demand Control Ventilation 21 Reeve St	25	0	25	0	\$1,680	4	\$10,000	\$0	\$10,000	6.0	15.0
	Demand controlled kitchen ventilation 300 Juliana Drive	172	0	172	0	\$8,940	29	\$20,000	\$0	\$20,000	2.2	15.0
	Free Cooling IT Room 21 Reeve St	33	0	33	0	\$4,780	1	\$20,000	\$0	\$20,000	4.2	15.0
	Sub-metering 56 Mckeand St	6	0	6	0	(\$140)	1	\$15,000	\$0	\$15,000	(107.1)	7.0
	Hallway Lighting MURB (14 Sites) 135 Carroll St	8	0	8	0	\$1,460	(0)	\$23,740	\$0	\$23,740	16.3	20.0
	Hallway Lighting MURB (14 Sites) 16 George St	10	0	10	0	\$1,570	0	\$17,050	\$0	\$17,050	10.9	20.0
	Hallway Lighting MURB (14 Sites) 178 Earl St	20	0	20	0	\$3,070	0	\$21,410	\$0	\$21,410	7.0	20.0
	Hallway Lighting MURB (14 Sites) 57 Rolph St	5	0	5	0	\$810	(0)	\$32,900	\$0	\$32,900	40.6	20.0
	Hallway Lighting MURB (14 Sites) 70 Maria St	15	0	15	2	\$2,200	0	\$14,940	\$0	\$14,940	6.8	20.0
	Hallway Lighting MURB (14 Sites) 82 Finkle St	4	0	4	0	\$610	0	\$6,180	\$0	\$6,180	10.1	20.0
	Hallway Lighting MURB (14 Sites) Various (14 sites)	58	0	58	0	\$8,740	1	\$79,980	\$0	\$79,980	9.2	20.0
<b>2024 Total</b>		<b>356</b>	<b>0</b>	<b>356</b>	<b>2</b>	<b>\$33,730</b>	<b>35</b>	<b>\$282,700</b>	<b>\$0</b>	<b>\$282,700</b>	<b>8.4</b>	<b>15.3</b>
2025	Energy Campaign TBD	0	0	0	0	\$0	0	\$5,000	\$0	\$5,000	N/A	0.0
	LED Lighting Upgrade 19 Van St	12	0	12	0	\$1,740	0	\$30,000	\$0	\$30,000	17.2	20.0
	LED Lighting Upgrade 300 Juliana Drive	229	0	229	0	\$33,220	6	\$230,000	\$0	\$230,000	6.9	20.0
<b>2025 Total</b>		<b>241</b>	<b>0</b>	<b>241</b>	<b>0</b>	<b>\$34,960</b>	<b>6</b>	<b>\$265,000</b>	<b>\$0</b>	<b>\$265,000</b>	<b>7.6</b>	<b>13.3</b>
<b>Grand Total</b>		<b>597</b>	<b>0</b>	<b>597</b>	<b>2</b>	<b>\$68,690</b>	<b>42</b>	<b>\$547,700</b>	<b>\$0</b>	<b>\$547,700</b>	<b>8.0</b>	<b>14.9</b>

**Table 19: Projects Cancelled or Reallocated to REAP and GFP**

Year	Description	Annual Projected Savings						Financial Estimates			Simple Payback Period (Yr.)	Estimated Life Span (Yr.)
		Energy (eMWh)	Renewable Energy Harvested (eMWh)	Net-Energy (eMWh)	Demand Reduction (kW)	Operation Cost	GHG Emissions	Capital Cost	Incentive	Planned Estimated Cost		
Cancelled	Power factor correction 300 Juliana Drive	0	0	0	0	\$0	0	\$30,000	\$0	\$30,000	N/A	15.0
	Air Curtain Pilot Project 515165 11th Line County Road 30	0	0	0	0	\$0	0	\$5,000	\$0	\$5,000	N/A	15.0
	CNG conversions - Ingersoll Vehicles 9 Trucks	0	0	0	0	\$0	0	\$110,000	\$0	\$110,000	N/A	7.0
	Idling reduction technology 5 Snow Plows	0	0	0	0	\$0	0	\$31,000	\$0	\$31,000	N/A	7.0
	Ingersoll CNG station 59 George Johnson Blvd	0	0	0	0	\$0	0	\$240,000	\$0	\$240,000	N/A	7.0
<b>Cancelled Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$0</b>	<b>0</b>	<b>\$416,000</b>	<b>\$0</b>	<b>\$416,000</b>	<b>N/A</b>	<b>10.2</b>
Moved to REAP	Woodstock WWTP Cogen - Biogas 195 Admiral St	1,819	0	1,819	0	\$76,120	332	\$100,000	\$0	\$100,000	1.3	20.0
Moved to REAP Total		1,819	0	1,819	0	\$76,120	332	\$100,000	\$0	\$100,000	1.3	20.0
<b>Grand Total</b>		<b>1,819</b>	<b>0</b>	<b>1,819</b>	<b>0</b>	<b>\$76,120</b>	<b>332</b>	<b>\$516,000</b>	<b>\$0</b>	<b>\$516,000</b>	<b>6.8</b>	<b>11.8</b>

# APPENDIX B: SUMMARY OF PROPOSED MEASURES

Table 20: Proposed Measures

Year	Description	Annual Projected Savings						Financial Estimates			Simple Payback Period (Yr.)	Estimated Life Span (Yr.)
		Energy (eMWh)	RE Energy Harvested (eMWh)	Net-Energy (eMWh)	Demand Reduction (kW)	Operation Cost	GHG Emissions	Capital Cost	Incentive	Planned Estimated Cost		
2024	Energy Campaign Corporate ALL	0	0	0	0	\$0	0	\$5,500	\$0	\$5,500	N/A	0.0
	Energy Planning and Design HS-Facilities	0	0	0	0	\$0	0	\$310,000	\$0	\$310,000	N/A	0.0
	Demand Control PW-Waste Water	25	0	25	0	\$3,630	1	\$2,080	\$0	\$2,080	0.6	15.0
	Air Source Heat Pump (ASHP) PW-Eng	8	34	42	0	(\$510)	11	\$14,960	\$1,200	\$13,760	(27.0)	20.0
	Air Source Heat Pump (ASHP) WFL-LTC	11	46	57	0	\$170	14	\$58,650	\$18,000	\$40,650	239.1	20.0
	Lighting Upgrades PW-Eng	4	0	4	0	\$730	0	\$18,000	\$0	\$18,000	24.7	20.0
	Lighting Upgrades PW-Waste Water	0	0	0	0	\$70	0	\$1,700	\$0	\$1,700	24.3	20.0
Lighting Upgrades PW-Water	2	0	2	0	\$340	0	\$8,500	\$0	\$8,500	25.0	20.0	
2024 Total		51	80	131	0	\$4,420	26	\$419,400	\$19,200	\$400,200	90.5	13.8
2025	Electrical Infrastructure HS-Facilities	0	0	0	0	\$0	0	\$388,080	\$0	\$388,080	N/A	25.0
	Energy Campaign Corporate ALL	0	0	0	0	\$0	0	\$5,500	\$0	\$5,500	N/A	0.0
	Energy Planning and Design Corporate ALL	0	0	0	0	\$0	0	\$1,200	\$0	\$1,200	N/A	0.0
	Energy Planning and Design HS-Facilities	0	0	0	0	\$0	0	\$7,370	\$0	\$7,370	N/A	7.0
	Energy Planning and Design PW-Water	0	0	0	0	\$0	0	\$11,950	\$0	\$11,950	N/A	7.0
	Building Envelop Upgrades HS-Facilities	32	0	32	9	\$4,600	1	\$195,080	\$72,200	\$122,880	26.7	25.0
	Existing Building Cx (EBCx) PW-Water	149	0	149	0	\$21,610	4	\$57,690	\$0	\$57,690	2.7	7.0
	Monitoring Based Cx (MBCx) PW-Waste Water	70	0	71	0	\$6,700	5	\$137,620	\$0	\$137,620	20.5	7.0
	Water Conservation HS-Facilities	47	0	47	0	\$7,830	9	\$53,750	\$41,720	\$12,030	1.5	15.0
	Air Source Heat Pump (ASHP) HS-Facilities	16	141	157	(1)	\$9,850	24	\$640,630	\$380,300	\$260,330	26.4	20.0
	Air Source Heat Pump (ASHP) WFL-LTC	6	23	29	0	\$80	7	\$43,130	\$18,000	\$25,130	314.1	20.0
	Bioenergy Harvesting PW-Waste Water	25	173	198	0	\$10,880	32	\$68,060	\$0	\$68,060	6.3	20.0
	Electrification Fuel Switching HS-Facilities	5	0	5	(25)	(\$8,960)	15	\$53,380	\$39,450	\$13,930	(1.6)	25.0
Lighting Upgrades PW-Waste Water	16	0	16	17	\$2,410	0	\$23,900	\$1,160	\$22,740	9.4	20.0	
2025 Total		366	337	703	(0)	\$55,000	96	\$1,687,340	\$552,840	\$1,134,500	20.6	12.2
2026	Electrical Infrastructure HS-Facilities	0	0	0	0	\$0	0	\$225,000	\$0	\$225,000	N/A	25.0
	Energy Campaign Corporate ALL	0	0	0	0	\$0	0	\$5,500	\$0	\$5,500	N/A	0.0
	Energy Planning and Design Corporate ALL	0	0	0	0	\$0	0	\$1,200	\$0	\$1,200	N/A	0.0
	Energy Planning and Design HS-Facilities	0	0	0	0	\$0	0	\$64,060	\$0	\$64,060	N/A	4.7
	Demand Control WFL-LTC	3	0	3	0	\$480	0	\$9,000	\$0	\$9,000	18.8	15.0
	Existing Building Cx (EBCx) PW-Waste Water	77	0	77	0	\$11,130	2	\$40,970	\$0	\$40,970	3.7	7.0
	Existing Building Cx (EBCx) PW-Water	32	0	32	0	\$4,580	1	\$19,620	\$0	\$19,620	4.3	7.0
	Monitoring Based Cx (MBCx) HS-Facilities	17	0	17	0	\$1,660	0	\$16,500	\$0	\$16,500	9.9	7.0

Year	Description	Annual Projected Savings						Financial Estimates			Simple Payback Period (Yr.)	Estimated Life Span (Yr.)
		Energy (eMWh)	RE Energy Harvested (eMWh)	Net-Energy (eMWh)	Demand Reduction (kW)	Operation Cost	GHG Emissions	Capital Cost	Incentive	Planned Estimated Cost		
	Monitoring Based Cx (MBCx) PW-Waste Water	16	0	16	0	\$1,600	0	\$12,360	\$0	\$12,360	7.7	7.0
	Process and Equipment Optimization HS-Facilities	11	0	11	0	\$1,950	(0)	\$66,700	\$0	\$66,700	34.2	15.0
	Water Conservation HS-Facilities	117	0	117	0	\$20,800	19	\$205,270	\$25,030	\$180,240	8.7	15.0
	Water Conservation WFL-LTC	23	0	23	0	\$3,350	4	\$19,700	\$0	\$19,700	5.9	15.0
	Air Source Heat Pump (ASHP) HS-Facilities	32	344	376	(18)	\$22,880	58	\$1,141,010	\$405,570	\$735,440	32.1	20.0
	Electrification Fuel Switching HS-Facilities	9	0	9	(17)	(\$13,150)	22	\$65,880	\$20,930	\$44,950	(3.4)	25.0
	Lighting Upgrades WFL-LTC	16	0	16	0	\$3,080	(0)	\$21,700	\$0	\$21,700	7.0	20.0
2026 Total		353	344	697	(34)	\$58,380	106	\$1,914,460	\$451,520	\$1,462,940	25.1	13.4
2027	Electrical Infrastructure HS-Facilities	0	0	0	0	\$0	0	\$75,000	\$0	\$75,000	N/A	25.0
	Energy Campaign Corporate ALL	0	0	0	0	\$0	0	\$5,500	\$0	\$5,500	N/A	0.0
	Energy Planning and Design Corporate ALL	0	0	0	0	\$0	0	\$1,200	\$0	\$1,200	N/A	0.0
	Energy Planning and Design HS-Facilities (Tenant UNMTR)	0	0	0	0	\$0	0	\$21,110	\$0	\$21,110	N/A	7.0
	Existing Building Cx (EBCx) PW-Waste Water	128	0	128	0	\$13,500	11	\$29,120	\$0	\$29,120	2.2	7.0
	Existing Building Cx (EBCx) WFL-LTC	112	0	112	0	\$9,050	14	\$48,590	\$0	\$48,590	5.4	7.0
	Monitoring Based Cx (MBCx) HS-Facilities	23	0	23	0	\$1,810	1	\$41,940	\$0	\$41,940	23.2	7.0
	Monitoring Based Cx (MBCx) PW-Water	13	0	13	0	\$970	1	\$8,120	\$0	\$8,120	8.4	7.0
	Air Source Heat Pump (ASHP) HS-Facilities	38	0	38	0	\$5,580	1	\$385,320	\$0	\$385,320	69.1	20.0
	Electrification Fuel Switching HS-Facilities	1	0	1	(3)	(\$1,080)	2	\$42,650	\$0	\$42,650	(39.5)	25.0
	Lighting Upgrades WFL-LTC	36	0	36	107	\$6,910	(1)	\$64,010	\$3,330	\$60,680	8.8	20.0
2027 Total		351	0	351	104	\$36,730	28	\$722,560	\$3,330	\$719,230	19.6	11.1
2028	Energy Campaign Corporate ALL	0	0	0	0	\$0	0	\$5,500	\$0	\$5,500	N/A	0.00
	Energy Planning and Design Corporate ALL	0	0	0	0	\$0	0	\$1,200	\$0	\$1,200	N/A	0.00
	Energy Planning and Design PW-Eng	0	0	0	0	\$0	0	\$4,040	\$0	\$4,040	N/A	7.00
	Energy Planning and Design PW-Roads Facilities	0	0	0	0	\$0	0	\$16,890	\$0	\$16,890	N/A	7.00
	Building Envelop Upgrades WFL-LTC	133	0	133	0	\$5,560	24	\$130,200	\$0	\$130,200	23.42	25.00
	Demand Control WFL-LTC	33	0	33	18	\$3,100	3	\$34,020	\$330	\$33,690	10.87	15.00
	Existing Building Cx (EBCx) PW-Waste Water	252	0	252	0	\$26,220	22	\$109,610	\$0	\$109,610	4.18	7.00
	HVAC Upgrades WFL-LTC	5	0	5	0	\$200	1	\$460	\$0	\$460	2.30	20.00
	Monitoring Based Cx (MBCx) PW-Water	12	0	12	0	\$1,030	0	\$8,560	\$0	\$8,560	8.31	7.00
	Water Conservation WFL-LTC	22	0	22	0	\$2,250	4	\$25,740	\$0	\$25,740	11.44	15.00
	Air Source Heat Pump (ASHP) HS-Facilities	90	0	90	(3)	\$1,030	21	\$154,900	\$0	\$154,900	150.39	15.00
	Electrification Fuel Switching WFL-LTC	0	0	0	0	(\$2,060)	3	\$13,140	\$0	\$13,140	(6.38)	25.00
	Lighting Upgrades PW-Eng	2	0	2	1	\$360	0	\$9,000	\$0	\$9,000	25.00	20.00
2028 Total		549	0	549	16	\$37,690	79	\$513,260	\$330	\$512,930	13.6	12.6
<b>Grand Total</b>		<b>1,670</b>	<b>760</b>	<b>2,430</b>	<b>86</b>	<b>\$192,220</b>	<b>334</b>	<b>\$5,257,030</b>	<b>\$1,027,230</b>	<b>\$4,229,800</b>	<b>22.00</b>	<b>12.74</b>

# APPENDIX C: FACILITIES HISTORICAL DATA

Table 21: Facilities Data by Year (2019 – 2023)

Year	County Operation	Area (SM)	Water Treatment Flow (ML)	Electricity (MWh)	Natural Gas (m3)	Energy (eMWh)	GHG Emissions (tCO2e)
2019	Human Services (Multi-Unit Housing)	29,422	0	4,055	168,476	5,957	442
	Public Works (Admin, libraries, EMS stations, childcare, etc.)	21,869	0	1,871	230,578	4,257	493
	Public Works (Patrol Yard Facilities)	6,316	0	172	85,628	1,318	224
	Public Works (Street/Traffic Lighting)	0	0	23	0	23	1
	Public Works (Waste Facilities)	1,505	0	117	0	431	51
	Public Works (Wastewater Plants)	13,162	17,268	9,423	301,231	14,150	856
	Public Works (Water Plants)	5,542	9,668	6,493	17,622	6,826	231
	Woodingford Lodge (LTC)	15,664	0	2,916	666,927	9,818	1,349
2019 Total		93,479	26,936	25,070	1,470,462	42,780	3,648
2020	Human Services (Multi-Unit Housing)	29,422	0	3,831	265,276	6,752	628
	Human Services (Single Family Townhouses)	13,008	0	14	220,145	2,292	417
	Public Works (COIN Towers/EV chargers)	0	0	44	0	44	1
	Public Works (Admin, libraries, EMS stations, childcare, etc.)	21,825	0	1,968	189,410	3,929	423
	Public Works (Patrol Yard Facilities)	8,345	0	257	64,952	1,110	171
	Public Works (Street/Traffic Lighting)	0	0	163	0	163	5
	Public Works (Waste Facilities)	7,167	0	64	0	241	34
	Public Works (Wastewater Plants)	13,178	16,912	10,209	287,879	14,916	881
	Public Works (Water Plants)	5,716	11,339	7,368	15,045	7,674	272
Woodingford Lodge (LTC)	15,664	0	3,240	567,993	9,128	1,181	
2020 Total		114,324	28,251	27,158	1,610,700	46,248	4,013
2021	Human Services (Multi-Unit Housing)	29,422	0	3,740	251,925	6,566	571
	Human Services (Single Family Townhouses)	13,008	0	14	215,622	2,245	408
	Public Works (COIN Towers/EV chargers)	0	0	47	0	47	1
	Public Works (Admin, libraries, EMS stations, childcare, etc.)	21,825	0	1,889	178,792	3,740	386
	Public Works (Patrol Yard Facilities)	8,345	0	260	69,768	1,146	174
	Public Works (Street/Traffic Lighting)	0	0	170	0	170	4
	Public Works (Waste Facilities)	7,167	0	61	0	269	39
	Public Works (Wastewater Plants)	13,178	16,917	9,833	245,320	14,586	714
	Public Works (Water Plants)	5,716	11,309	7,272	15,155	7,579	214
Woodingford Lodge (LTC)	15,664	0	2,937	578,311	9,359	1,168	
2021 Total		114,324	28,226	26,222	1,554,892	45,706	3,679
2022	Human Services (Multi-Unit Housing)	29,422	0	3,728	266,679	6,723	599
	Human Services (Single Family Townhouses)	13,664	0	18	238,841	2,490	452
	Public Works (COIN Towers/EV chargers)	0	0	51	0	51	1



Year	County Operation	Area (SM)	Water Treatment Flow (ML)	Electricity (MWh)	Natural Gas (m3)	Energy (eMWh)	GHG Emissions (tCO2e)
	Public Works (Admin, libraries, EMS stations, childcare, etc.)	21,982	0	2,012	215,901	4,246	459
	Public Works (Patrol Yard Facilities)	8,345	0	273	71,593	1,227	189
	Public Works (Street/Traffic Lighting)	0	0	161	0	161	4
	Public Works (Waste Facilities)	7,167	0	72	0	468	50
	Public Works (Wastewater Plants)	13,178	15,837	10,359	314,026	16,130	880
	Public Works (Water Plants)	5,716	11,823	7,807	15,141	8,023	243
	Woodingford Lodge (LTC)	15,664	0	2,851	538,315	8,957	1,090
2022 Total		115,137	27,659	27,331	1,660,495	48,476	3,967
2023	Human Services (Multi-Unit Housing)	29,660	0	3,549	220,306	6,067	507
	Human Services (Single Family Townhouses)	13,664	0	20	218,454	2,281	413
	Public Works (COIN Towers/EV chargers)	0	0	69	0	69	2
	Public Works (Admin, libraries, EMS stations, childcare, etc.)	22,398	0	1,943	177,983	3,802	388
	Public Works (Patrol Yard Facilities)	8,855	0	265	64,807	1,122	170
	Public Works (Street/Traffic Lighting)	0	0	203	0	203	5
	Public Works (Waste Facilities)	7,167	0	67	0	343	53
	Public Works (Wastewater Plants)	13,192	17,523	10,279	290,270	16,017	813
	Public Works (Water Plants)	5,911	10,705	7,578	16,874	7,799	237
Woodingford Lodge (LTC)	15,664	0	2,704	548,789	8,928	1,106	
2023 Total		116,511	28,228	26,676	1,537,483	46,629	3,694