Town of Halton Hills 2024-2029 Energy Conservation and Demand Management Plan

March 2025

Management sign-off

I confirm that Town of Halton Hills' senior management has reviewed and approved this 2024-2029 Energy Conservation and Demand Management Plan.

Signature: _____

Name: _____ Date: _____

Title: _____

Under Ontario Regulation 25/23 BROADER PUBLIC SECTOR: ENERGY REPORTING AND CONSERVATION AND DEMAND MANAGEMENT PLANS, Ontario's broader public sector organizations are required to develop and publish an Energy Conservation and Demand Management Plan for the five year period from 2024 – 2029.Technical advice and analysis for this ECDM Plan were provided by Enerlife Consulting Inc.

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Executive summary

This Energy Conservation and Demand Management Plan (ECDM plan), in accordance with Ontario Regulation 25/23, serves as a roadmap for energy efficiency initiatives at the Town for the next 5 years, laying the groundwork for achieving the Town's energy efficiency and cost reduction goals. The plan focuses on immediate plans for building system improvements and effective management of its facilities, builds on asset management plans, and identifying early successes to build confidence and momentum.

This ECDM plan reviews progress on energy and emissions efficiency in Town facilities since 2019, including energy conservation measures implemented and energy savings achieved, as identified in the 2019 – 2023 ECDM plan. Despite COVID disruptions, building retrofits and increases in building use, programs, and customer services, the Town achieved a 2% reduction in energy consumption over this period from a 2018 baseline. This resulted in about $235,569 in cost savings. A 35.7% reduction in water use netted $123,333 in water savings, bringing the total savings to $358,902 since 2019. The Town also avoided 32 equivalent tonnes of greenhouse gas emissions.

Looking forward, the plan outlines the Town's energy and emissions reduction strategy from 2024 – 2029. With COVID challenges in the past and a strategy to manage increases in building use, the aim is to achieve a reduction of up to 11% in total energy use for the Town, resulting in estimated annual cost savings of $156,117 and a 14% reduction in emissions by 2029. This would decrease the town-wide energy use intensity from 34.9 to 30.1equivalent kilowatt-hours per square foot (ekWh/ft²), as indicated in Table 1.

To achieve this reduction, this plan outlines practical operational measures to improve building performance while reducing utility costs in three key facilities – Mold Master Sportsplex, Town Hall and Fire Station 2. Implementing these measures will achieve the target reduction and can subsequently be replicated in other similar buildings. Additionally, capital retrofits planned for 2024 – 2029 are listed as well in Section 8 and will result in additional savings when implemented.

Table 1 Town of Halton Hills Actual use and target use summary

2023 Actual energy use		Target use		Total reduction					
Total energy ekWh	**EUI ekWh/ft²**	**Total energy ekWh**	**EUI ekWh/ ft²**	**Electricity %**	**Electricity $**	**Natural gas %**	**Natural gas $**	**Total energy reduction**	**% GHG reduction**
16,201,581	34.9	14,407,780	31.0	9%	$123,542	13%	$32,575	11%	14%

Part 1: Introduction

About Town of Halton Hills

The Town of Halton Hills is a municipality in the Regional Municipality of Halton, located in the northwestern end of the Greater Toronto Area, Ontario, Canada.

The Town has built a strong reputation in optimizing facility operations, while effectively and efficiently managing energy use and emissions. Development of high efficiency new buildings and an energy conservation ethos among staff and facility managers, together with implementation of practical renewable energy projects has brought benefits to employees and residents while reducing utility costs. A comprehensive list of the projects completed since 2019 can be found in Section 2.

Halton Hills has built on past achievements and established best practices. Benchmarking relative to other similar buildings illustrates the Town's facilities are comparable in terms of energy efficiency. Energy efficiency initiatives and retrofits are improving building conditions and reducing operating costs and emissions. The Town has gained valuable experience with alternative energy solutions, such as solar and geothermal installations, for further cost and emissions savings.

The Town's primary facilities are as follows – listed by size.

Table 2 Town of Halton Hills facilities

Facility	Address	Building area (ft²)
Mold-Masters Sportsplex	221 Guelph St. Georgetown ON L7G 4A8	151,000
Acton Arena and Community Centre	415 Queen St. Acton ON L7J 2N2	92,000
Halton Hills Public Library and Cultural Centre	9 Church St. Unit A Georgetown ON L7G 2A3	50,500
Halton Hills Town Hall	1 Halton Hills Dr. Georgetown ON L7G 5G2	40,000
Gellert Community Centre	10241 Eighth Line Georgetown ON L7G 4S5	38,000
Robert Austin Operation Centre	11620 Trafalgar Rd. Halton Hills ON L1L 1L1	25,000
Fire Station - District 2	53 Maple Ave. Georgetown ON L7G 1X8	15,934
Fire Station - District 3 HQ	14007 10 Sideroad, Halton Hills, ON, L7G 4S5	13,616
Cedarvale Community Centre	183 Main St. Georgetown ON L7G 5S2	11,500
Fire Station - District 1	21 Churchill Rd. S Acton ON L7J 2J5	11,136
Public Library - Acton Branch	17 River St. Acton ON L7J 1C2	9,000
Prospect Park Boathouse	30 Park Ave. Acton ON L7J 1Y5	4,800
Acton Works Yard	3 Commerce Cres. Acton ON L7J 2X2	2,400

Energy Conservation and Demand Management Plan horizon and scope

Ontario Regulation 25/23 requires every public sector agency to develop and publish an energy conservation and demand management plan that includes:

- Annual energy and greenhouse gas emissions for the year prior to when the plan is to be submitted for each building, total and by energy type.
- Description of the results of the previous activities and measures to conserve the energy consumed.
- Cost and savings estimates for the current and proposed activities and measures.
- Description of any renewable energy generation and amount of energy produced on an annual basis.

This ECDM plan outlines achievable projects and improvements to reduce energy and emissions in Town facilities for the 5-year period from 2024 to 2029. As outlined in detail in Part 3, this plan outlines how we plan to reduce energy use and emissions by up to 11% in Town facilities by 2029 as compared with 2023 as baseline year.

While the Plan leverages existing/ongoing and planed facility improvements and retrofits, where appropriate, full implementation will be dependent on follow-up more detailed project studies and plans, as well as the Town's financial capacity and Council's review/approval of future capital projects.

Part 2: Results from the past 5 years (2019-2023)

1 Energy progress compared to targets

In the previous Corporate Energy plan posted on July 1, 2019, the Town aimed to implement a framework to support continued energy and sustainability initiatives within the built environment. Table 3 presents the original 2019 planned savings and the actual, weather-normalized performance results from the 2023 calendar year compared to the 2018 baseline for all Town facilities. From 2019 to 2023, there was a total energy reduction of 2% and net energy cost savings of $235,569. There were significant water savings of 35.7% resulting in $123,333 saved. For detailed utility rates, see Appendix A. Performance data for individual facilities over the past five years (2019-2023) is provided in Appendix B.

Table 3 Town of Halton Hills Energy savings vs 2018 baseline

	2019 ECDM target savings[2]				**2023 Actual savings vs 2018 baseline**			
	Units	**%**	**$**	**GHG tonnes eCO_2**	**Units**	**%**	**$.**[1]	**GHG tonnes eCO_2**
Electricity (kWh)	1,857,459	12%	$297,193	36	1,486,242	4.1%	$237,799	45
Natural Gas (m^3)	375,255	24%	$123,834	720	-6,756	-0.2%	$-2,229	-13
Total Energy (ekWh)	**5,741,348**	**36%**	**$421,028**	**756**	**1,416,317**	**2.0%**	**$235,569**	**32**
Water (m^3)	-	-	-	-	286,82	35.7%	$123,333	0
Total	-	-	-	-			**$358,902**	**32**

[1] Using 2024 utility rates: electricity $0.16/kWh, natural gas $0.33/$m^3$ and water $4.30/$m^3$

[2] Planed target from Town of Halton Hills 2020-2025 Corporate Energy Plan

The subsequent monthly savings graphs provide a detailed analysis of each year, reflecting either reductions or increases in utility consumption. In Figures 1-3 below (and Appendix B), blue data points represent actual monthly usage while the red data points depict the comparative weather-normalized consumption based on the 2018 baseline. Instances where blue data points fall below red data points indicate energy savings.

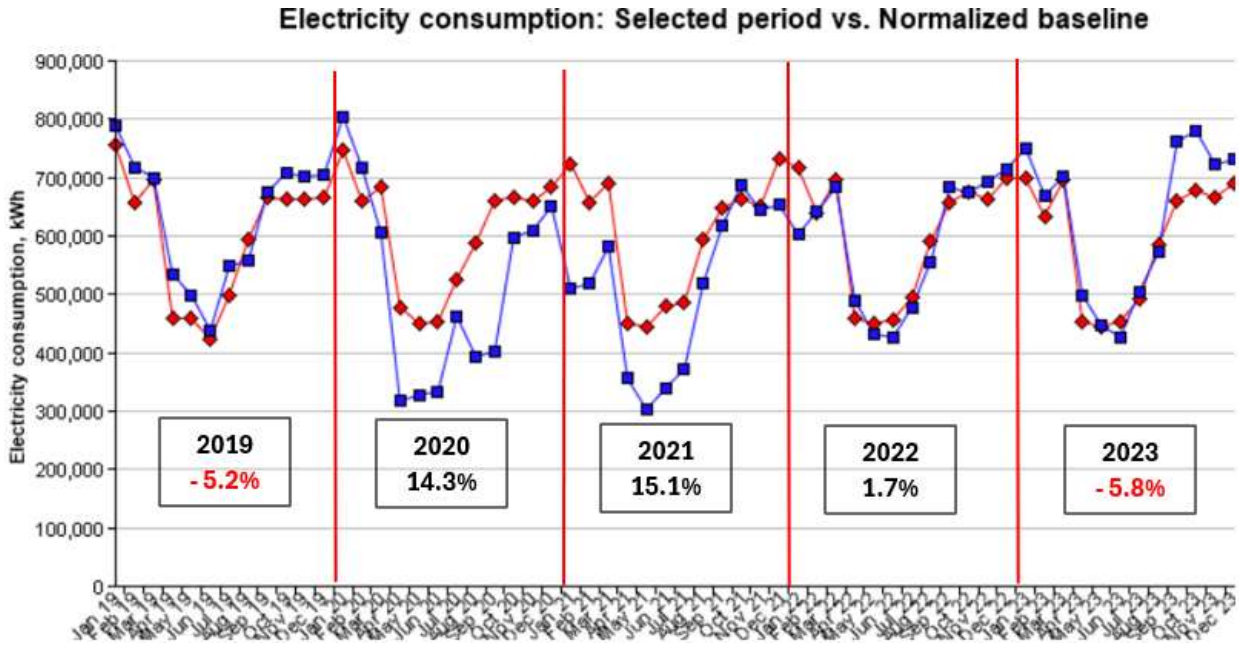

Figure 1 Town of Halton Hills electricity consumption (kWh) in 2019-2023 vs 2018 baseline

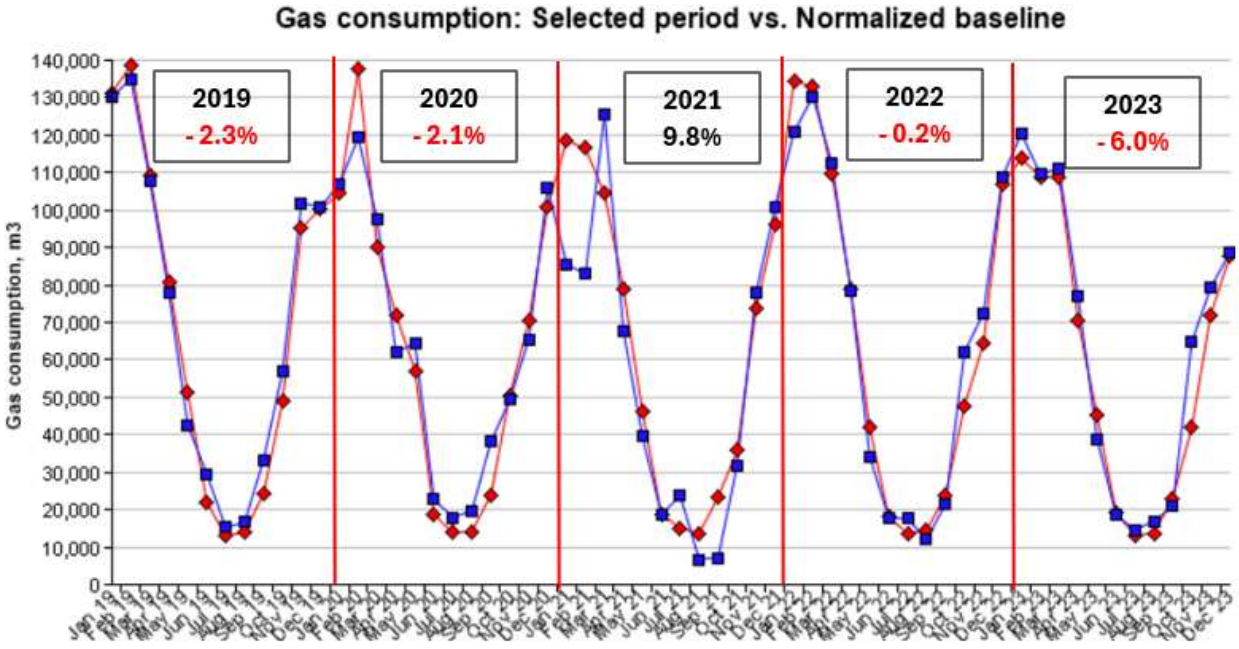

Figure 2 Town of Halton Hills natural gas consumption (m3) in 2019-2023 vs 2018 baseline

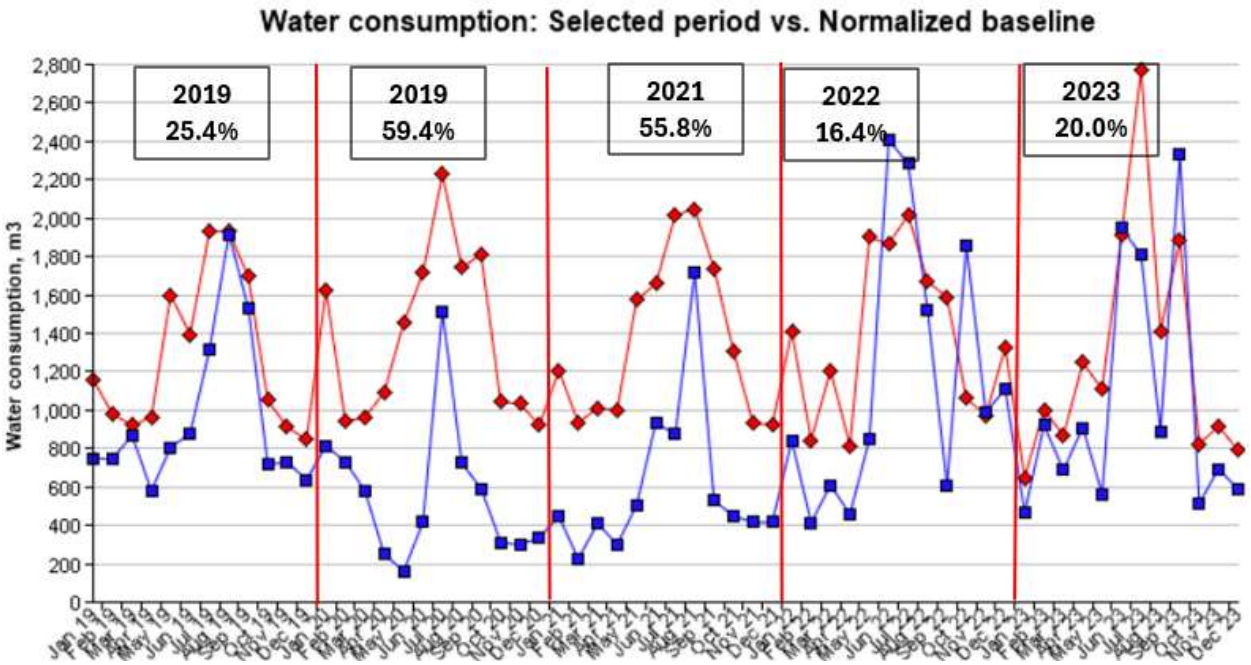

Figure 3 Town of Halton Hills Water consumption (m3) in 2019-2023 vs 2018 baseline

2 Measures implemented in 2019-2023

The following energy efficiency and construction projects have been completed since 2019.

Table 4 Completed projects since 2019

#	Year	Project name
1	2019	Town Hall phased replacement of heat pumps
2	2020	Acton Arena upper-level window replacement
3	2020	Acton Arena flat roof
4	2020	Mold-Masters SportsPlex low e ceiling
5	2020	Mold-Masters SportsPlex dehumidifiers replacement - Fernbrook pad
6	2020	Town Hall phased replacement of heat pumps
7	2021	Mold-Masters SportsPlex Low E Ceiling
8	2021	Mold-Masters SportsPlex replace dehumidifiers
9	2021	Town Hall phased replacement of heat pumps
10	2022	Acton Arena dehumidification unit
11	2022	Acton Arena interior lighting
12	2022	Acton Arena exterior lighting replacement
14	2022	Acton Arena heat recovery system
15	2022	Acton Arena lobby A/C installation
16	2022	Mold-Masters SportsPlex heat recovery system
17	2022	Mold-Masters SportsPlex phased dehumidification
18	2022	Town Hall replace heat pumps
19	2022	Town Hall MUA replacement
20	2022	Town Hall air handling unit
21	2022	Town Hall fittings and equipment

3 Renewable energy

3.1 Solar Photovoltaics

Rooftop solar photovoltaic systems have been installed in 3 facilities at the Town of Halton Hills, as listed in the table below. They are owned and operated by Southwest Energy and Halton Hills Community Energy Corporation (HHCEC) under the Fee in Tariff (FIT) program. All energy generated produces revenue for Southwest Energy. They generate approximately 1 megawatt (MW) of electricity per year.

The table below summarizes the total photovoltaic energy generation.

Table 5 Solar photovoltaic energy generation

Facility	Capacity in kW	2019 Total energy (kWh)	2020 Total energy (kWh)	2021 Total energy (kWh)	2022 Total energy (kWh)	2023 Total energy (kWh)	2019-2023 Total energy (kWh)
Mold-Masters Sportsplex	450	553,437	604,012	528,948	601,165	563,923	**2,851,485**
Robert Austin Operation Centre	100	129,272	153,502	148,451	154,262	142,446	**727,933**
Acton Arena & Community Centre	610	320,145	341,943	327,609	338,837	289,634	**1,618,168**
Total	**1160**	**1,002,854**	**1,099,457**	**1,005,008**	**1,094,264**	**996,003**	**5,197,586**

4 Successes and lessons learned

Continuous improvement across all Town operations was the primary goal of the 2019 – 2023 plan. However, impacts from the COVID-19 pandemic including increased ventilation requirements, periodic closures and supply chain issues, disrupted energy efficiency performance and measure implementation. Facilities also experienced a significant increase in use due to population growth, increased community programming and extended facility hours of operation.

Despite these challenges, Halton Hills remains committed to operational and cost efficiency through informed planning, strategic asset management and innovative technological solutions. With broad energy studies completed, focus is now on detailed planning, building renewal, implementation of practical energy efficiency measures, and continued effective asset management. Feasibility studies are being conducted identifying and detailing technologies and detailed designs. There is a strong emphasis on aligning asset management renewal with energy management goals.

Part 3: The plan for the next 5 years (2024-2029)

From 2024-2029, the Town plans to reduce energy use by up to 11% based on operational improvements, as well as the state of good repair and capital renewal projects outlined in asset management plans. The measures described below are designed to achieve this goal realizing utility cost savings of approximately $156,117/year at 2024 rates and greenhouse gas (GHG) emissions reduction of 217 tonnes of eCO2 /year.

As part of the plan's development, site visits were conducted at three reference buildings – Mold-Masters SportsPlex, Town Hall, and Fire Station District 2 – to verify targets, determine potential operational improvements, gather technical details, and estimate costs for the proposed measures. Measures identified determined the energy targets for 2029 and calculation of potential savings.

5 2023 energy and water use

Table 6 below presents the 2023 baseline utility consumption, costs, and GHG emissions for all Town of Halton Hills facilities.

Table 6 2023 Energy and water data

Site	Energy type	2023 consumption	Energy use intensity (EUI)	2023 Costs ($)	Greenhouse gas emissions (tonnes eCO_2)
Mold-Masters Sportsplex	Electricity	2,944,472 kWh	19.5 ekWh/ft²	$471,116	58.9
	Natural Gas	221,714 m³	15.2 ekWh/ft²	$73,166	424.8
	Water	6,318 m³	-	$27,167	-
		Total Energy	**34.7 ekWh/ft²**	**$571,449**	**483.7**
Gellert Community Centre	Electricity	841,933 kWh	22.2 ekWh/ft²	$134,709	16.8
	Natural Gas	217,998 m³	59.4 ekWh/ft²	$71,939	417.7
	Water	6,444 m³	-	$234,357	-
		Total Energy	**81.6 ekWh/ft²**	**$234,357**	**434.5**
Acton Arena & Community Centre	Electricity	2,301,869 kWh	25.0 ekWh/ft²	$368,299	46.0
	Natural Gas	133,432 m³	15.0 ekWh/ft²	$44,033	255.7
	Water	5,485 m³		$23,585	
		Total Energy	**40.0 ekWh/ft²**	**$435,917**	**301.7**
Robert Austin Operation Centre	Electricity	466,218 kWh	18.6 ekWh/ft²	$74,595	9.3
	Natural Gas	75,175 m³	31.1 ekWh/ft²	$24,808	144.0
	Water	7,015 m³	-	$30,165	-
		Total Energy	**49.7 ekWh/ft²**	**$129,568**	**153.3**
Fire Station - District 2	Electricity	262,739 kWh	16.5 ekWh/ft²	$42,038	5.3
	Natural Gas	14,976 m³	9.7 ekWh/ft²	$4,942	28.7
	Water	915 m³	-	$1,720	

Site	Energy type	2023 consumption	Energy use intensity (EUI)	2023 Costs ($)	Greenhouse gas emissions (tonnes eCO_2)
		Total Energy	**26.2 ekWh/ft²**	**$48,700**	**34.0**
Fire Station - District 1	Electricity	94,932 kWh	8.5 ekWh/ft²	$15,189	1.9
	Natural Gas	17,013 m³	15.8 ekWh/ft²	$5,614	32.6
	Water	915 m³	-	$3,935	-
		Total Energy	**24.3 ekWh/ft²**	**$24,738**	**34.5**
Acton Works Yard	Electricity	15,536 kWh	6.5 ekWh/ft²	$2,486	0.3
	Natural Gas	9,760 m³	42.1 ekWh/ft²	$3,221	18.7
	Water	44 m³		$189	-
		Total Energy	**48.6 ekWh/ft²**	**$5,896**	**19.0**
Fire Station - District 3 HQ	Electricity	194,266 kWh	14.3 ekWh/ft²	$31,083	3.9
	Natural Gas	8,125 m³	6.2 ekWh/ft²	$2,681	15.6
	Water	323 m³	-	$1,389	-
		Total Energy	**20.5 ekWh/ft²**	**$35,153**	**19.50**
Halton Hills Public Library and Cultural Centre	Electricity	644,764 kWh	12.8 ekWh/ft²	$103,162	15.6
	Natural Gas	1,945 m³	0.4 ekWh/ft²	$642	3.7
	Water	663 m³	-	$2,851	-
		Total Energy	**13.2 ekWh/ft²**	**$106,655**	**19.30**
Halton Hills Town Hall	Electricity	496,564 kWh	12.4 ekWh/ft²	$79,450	9.9
	Natural Gas	27,139 m³	7.0 ekWh/ft²	$8,956	52.0
	Water	1019 m³	-	$4,382	-
		Total Energy	**19.4 ekWh/ft²**	**$92,788**	**61.90**
Cedarvale CC	Electricity	20,732 kWh	1.8 ekWh/ft²	$3,317	0.4
	Natural Gas	12,419 m³	11.2 ekWh/ft²	$4,098	23.8
	Water	191 m³	-	$821	-
		Total Energy	**13.0 ekWh/ft²**	**$8,236**	**24.20**
Public Library - Acton Branch	Electricity	182,788 kWh	20.3 ekWh/ft²	$29,246	3.7
	Natural Gas	1,094 m³	1.3 ekWh/ft²	$361	2.1
	Water	137 m³	-	$589	-
		Total Energy	**21.6 ekWh/ft²**	**$30,196**	**5.80**
Prospect Park Boathouse	Electricity	44,754 kWh	9.3 ekWh/ft²	$7,161	0.9
	Natural Gas	2,206 m³	4.8 ekWh/ft²	$728	4.2
	Water	2125 m³	-	$9,138	-
		Total Energy	**14.1 ekWh/ft²**	**$17,027**	**5.10**
		Totals	**34.9 ekWh/ft²**	**$1,740,680**	**1,597**

6 Target energy reduction

The plan focuses on three specific facilities—Mold-Masters SportsPlex, Town Hall, and Fire Station 2— and the measures and savings as outlined in Section 7.

Table 7 below summarizes the projected energy savings and cost savings for these three facilities once the proposed measures are implemented. It illustrates the target of 11% annual energy savings will be comprised of 9% electricity savings and 13% natural gas savings. These three facilities were chosen as they had the greatest potential energy savings when compared with other similar facilities in other municipalities. The methodology used, targets and potential energy savings are detailed in Appendix C – Potential energy savings and targets.

Table 7 Energy savings targets

Facility	Electricity savings (kWh/year)	Natural gas savings (m3/year)	Total annual savings (ekWh/year)	Total annual cost savings ($/year)	GHG emissions reductions (tonnes eCO2/year)
Mold Masters SportsPlex	528,854 kWh	77,336 m³	1,329,286	$110,138	168
Town Hall	145,200 kWh	15,773 m³	308,447	$28,437	36
Fire Station 2	98,085 kWh	5,602 m³	156,068	$17,542	14
Total 3 facilities	**772,138 kWh**	**98,711 m³**	**1,793,801**	**$156,117**	**217**
% savings vs. total 2023 energy use	**9%**	**13%**	**11%**	**9%**	**14%**

7 Energy efficiency measures

Table 8 to Table 10 summarize the proposed energy efficiency measures for 3 sites along with estimated costs, savings, and payback. This includes estimated energy efficiency incentives from utilities. The energy efficiency measures are described in more detail starting at Section 0. Utility rates and incentive assumptions are provided in

Appendix A – Rates, assumptions and conversion factor for energy efficiency measures.

Table 8 Mold-Masters SportsPlex Energy efficiency projects summary

Mold-Masters SportsPlex energy efficiency measures	Impl. Year	New funding required		Savings			Incentives	Payback (with incentives)	GHG emissions reductions (tonnes eCO_2/year)
Ventilation									
Schedule air handling units to match night occupancy	**24/25**	$51,000	$78,000	128,210 kWh	0 m³	$20,514	$12,821	3.2	5
Testing and re-balancing	**24/25**	$27,000							
Building automation and lighting controls									
Building automation system	**25/26**	$250,000	$295,000	205,447 kWh	55,240 m³	$51,101	$34,355	5.1	114
Re-programming	**25/26**	$45,000							
Heating plant									
Boiler plant testing and optimization	**25/26**	$33,000	$33,000	0 kWh	22,096 m³	$7,292	$5,524	3.8	42
Cooling plant									
Dehumidifier optimization - test space sensor and optimize relative humidity levels to match space requirements	**24/25**	$10,000	$132,000	146,330 kWh	0 m³	$23,413	$14,633	5.0	5
Reset space and ice temperature based on building occupancy/use	**25/26**	$8,000							
Install variable frequency drive on brine pumps and optimization	**25/26**	$60,000							
Test and investigate the heat recovery loops for operations and optimize for maximum heat recovery	**25/26**	$44,000							
Investigate and implement cold water resurfacing	**25/26**	$10,000							
Capital plan – Recommend exhaust heat recovery for the current make-up air unit replacement									
Lighting									
Upgrade to LED	26/27	$50,000		48,868 kWh	0 m³	$7,819	$0	6.4	2
Total		**$588,000**		**528,855 kWh**	**77,336 m³**	**$110,139**	**$67,333**	**4.7**	**168**

Table 9 Town Hall Energy efficiency projects summary

Town Hall energy efficiency measures`	Impl. Year	New funding required		Savings			Incentives	Payback (with incentives)	GHG emissions reductions (tonnes eCO_2/year)
Ventilation									
Schedule air handling units to match night occupancy	**24/25**	$9,000	$19,500	16,800 kWh	1,649 m³	$3,232	$2,092	5.4	4
Testing and re-balancing	**24/25**	$10,500							
Building automation and lighting controls									
Building automation system	**25/26**	$150,000	$158,000	92,840 kWh	11,041 m³	$18,498	$12,044	7.9	25
Re-programming	**25/26**	$8,000							
Heating plant									
Boiler plant testing and optimization	**24/25**	$8,000	$8,000	4,000 kWh	3,083 m³	$1,657	$1,171	4.1	6
Feasibility study - boiler replacement*	**25/26**								
Cooling plant									
Testing and balancing	**24/25**	$2,500	$8,500	9,560 kWh	0 m³	$1,530	$956	4.9	0
Cooling tower operations optimization	**25/26**	$6,000							
Lighting									
Upgrade to LED	**26/27**	$25,000		22,000 kWh	0 m³	$3,520	$2,200	6.5	1
Total		**$219,000**		**145,200 kWh**	**15,773 m³**	**$28,437**	**$18,463**	**7.1**	**36**

**The feasibility study needs to be conducted before estimated any cost and savings*

Table 10 Fire Station 2 Energy efficiency projects summary

Fire Station 2 energy efficiency measures	Impl. Year	New funding required		Savings			Incentives	Payback (with incentives)	GHG emissions reductions (tonnes eCO_2/year)
Ventilation									
Schedule air handling units to match night occupancy	**24/25**	$6,000	$11,000	18,218 kWh	1,061 m³	$3,265	$2,087	2.7	3
Testing and re-balancing	**24/25**	$5,000							
Building automation and lighting controls									
Building automation system	**25/26**	$35,000	$38,000	47,644 kWh	1,740 m³	$8,197	$5,199	4.0	5
Re-programming	**25/26**	$3,000							
Heating plant									
Heat pump testing and optimization	**25/26**	$10,000	$23,500	32,223 kWh	2,801 m³	$6,080	$3,923	3.2	7
Garage bay heating optimization	**25/26**	$5,500							
Reset water temp in summer and winter based on outdoor air temperature	**25/26**	$8,000							
Total		**$72,500**		**98,085 kWh**	**5,602 m³**	**$17,542**	**$11,209**	**3.5**	**15**

8 Detailed description of energy measures

The following provides more in-depth descriptions of the energy measures listed in the tables above.

8.1 Ventilation

- **Schedule rooftop units (RTUs) and air handling units (AHUs) to match operation hours:**
  - Scheduling RTUs and AHUs to align with operation hours is crucial to avoid unnecessary energy waste during unoccupied time. Operating HVAC units outside occupied hours leads to excess fan usage and inefficient cooling and heating.
    - **Match schedules to operation hours**: Revise the sequence of operations to ensure all unit schedules are synchronized with operation hours.
    - **Utilize occupancy sensors**: Where available, integrate occupancy sensors to enable or disable units during occupied hours. This provides an additional layer of optimization by only running HVAC systems when needed.
    - **Prioritize time-of-day schedules**: To avoid false starts due to transient occupancy during unoccupied periods, prioritize time-of-day scheduling over sensor feedback.
- **Test and balance RTUs and/AHUs air flow and correct any performance issues:**
  - Over time, the performance of rooftop units and air handling units can degrade due to a range of operational and construction-related issues. This deterioration often leads to decreased occupant comfort and increased energy consumption. To maintain optimal airflow and system efficiency, regular testing and measurement are essential.
  - Routine system testing ensures that design airflow is consistently delivered to spaces while identifying and addressing common problems such as duct leakage, component pressure drops, and mechanical blockages. Issues like plugged heating/cooling coils, obstructed outside air louvers, and failed fire dampers can significantly impact system performance by causing pressure losses. Regular testing not only verifies that design specifications are met but also helps identify potential inefficiencies before they lead to major performance shortfalls.
  - Clean outside bird screen and confirm damper operations: Any debris collected on outside bird screens cause pressure drop in the system resulting in underperformance.

8.2 Building automation

- **Install building automation system:**
  - Integrate air handling units, chillers, boilers and pumps into the BAS, ensuring all equipment is centrally monitored and controlled. Additionally, build trend logging capabilities to capture more operational data across these systems, enabling enhanced monitoring, diagnostics, and long-term performance analysis.
    Installing a BAS system will allow to maximize all other measures.
- **Investigate sequence of operations and implement new smart sequence of operations:**

- New smart sequence of operations delivers optimized performance which achieves occupant comfort and minimize energy use. Optimize and implement the following sequence of operations including but not limited to:
  - Economizer control
  - Supply air temperature and static pressure reset control and optimization.
  - Outside air percentage control and optimization

8.3 Heating plant and systems

- **Boiler plant testing and optimization:**
  - Test, balance and optimize pump operation including triple-duty valve, differential pressure setpoints.
  - Review sequence of operations, setpoints and stagging or pumps and boilers to optimize heating operations reducing overall energy use.
  - Achieving energy-efficient operations in a pumping system relies on optimizing flow and pressure. Traditionally, triple duty valves are used to balance system flow while also acting as check valves. Balancing the systems with variable volume flow, can be more effectively managed using variable frequency drives.
  - Triple duty valves introduce unnecessary pressure drops, which can hinder system efficiency. By fully opening these valves, the pressure drop is eliminated, allowing the variable frequency drive to modulate down to a new differential pressure setpoint. This adjustment reduces system pressure and, in turn, decreases energy consumption, leading to more efficient overall operation.
- **Town Hall: turn off boilers in summer:**
  - Boilers are kept ON in the summer. The boilers should be turned off, and space temperature control should be managed by optimizing ventilation system airflow and adjusting supply air temperatures during the summer.
- **Fire Hall: garage bay heating optimization:**
  - The garage bay has two sources of heating, overhead infrared gas heaters and under floor heating from the heat pumps. Both systems operate independently and should be integrated to the BAS and interlocked with the garage doors.

8.4 Cooling plant and systems

- **Investigate sequence of operations and implement new smart sequence of operations:**
  - Operating cooling plant at minimal energy use requires an optimized sequence of operations that efficiently manages various equipment such as pumps, cooling towers and chillers. Current operation should be verified through trend reviews and new smart sequence of operations should be implemented to improve cooling plant performance
- **Town Hall: Cooling tower operations optimization:**
  - Test colling tower for full and part load efficiencies and pumps for optimized operations:
    - This process involves testing the cooling tower to assess both full-load and part-load efficiencies, ensuring they operate at peak performance under varying conditions. Additionally, pumps should be tested and balanced to confirm that they are delivering optimal flow rates and pressure levels. Proper testing and balancing are crucial for identifying inefficiencies, reducing energy waste, and

maintaining consistent system performance throughout different load scenarios.

- **Mold-Master: Cooling plant optimization:**
  - Dehumidifier optimization
    - Test space sensor and optimize relative humidity level to match with space requirements and reset setpoint for occupied and unoccupied periods.
  - Reset space and ice temperature based on building occupancy/use
    - Programming reset temperatures minimize energy when there is no occupancy in the building and maximize the heat recovery when there is occupancy.
  - Install variable frequency drive on brine pumps and optimization
    - The brine pumps are heavy energy users and to rely on triple duty valves to balance the flow. Variable frequence drive should be used to balance the flow and lower the pumps speed minimizing the energy use.
    - Triple duty valves introduce unnecessary pressure drops, which can hinder system efficiency. By fully opening these valves, the pressure drop is eliminated, allowing the variable frequency drive to modulate down to a new differential pressure setpoint. This adjustment reduces system pressure and, in turn, decreases energy consumption, leading to more efficient overall operation.
  - Test and investigate the heat recovery loops for operations and optimize for maximum heat recovery
    - Both ice plants are equipped with heat recovery from the compressors, the systems should be tested, balanced and optimized.
  - Investigate and implement cold water resurfacing
    - New technology has emerged in recent year that allow colder ice resurface water than currently in use.
  - Integrate existing equipment into the BAS to enable centralized monitoring and control. This connection will provide visibility into the operation of each split unit, allowing for better management of setpoints, schedules, and energy use. Additionally, integrating all equipment to the BAS will allow for automated alerts and improved diagnostics, contributing to overall system efficiency and easier maintenance.

8.5 Lighting and lighting controls

- **Convert existing fluorescent lighting to LED**:
  - Upgrade existing fluorescent lighting to energy-efficient LED fixtures. This conversion will not only reduce energy consumption but also enhance lighting quality and lower maintenance costs. LED lighting offers a longer lifespan and better control options, making it a crucial step toward energy conservation.

9 Additional planned capital measures

As indicated previously, capital measures planned for the 2024 – 2029 period are listed below. These have already been planned for asset renewal, replacement of building systems at end of life, and energy and emissions reductions. These consist of planned capital measures outlined in the Town's 10-year capital plan for the 3 facilities: Mold-Masters SportsPlex, Town Hall and Fire Station 2. Subject to the annual budget process and Council's approval of the projects, the savings associated with these projects will be in addition to the 11% energy reduction outlined in the plan.

Table 11 Planned capital measures 3 facilities: Mold-Masters SportsPlex, Town Hall and Fire Station 2

Facility	Project name	Implementation year	New funding required
Mold-Masters SportsPlex	MMSP replace power distribution	2025	$324,000
Mold-Masters SportsPlex	MMSP BAS implementation	2025	$300,000
Mold-Masters SportsPlex	MMSP inverter battery replacements	2025	$16,000
Mold-Masters SportsPlex	MMSP boiler replacements	2025	$200,000
Mold-Masters SportsPlex	MMSP HVAC replacement	2025	$1,799,000
Mold-Masters SportsPlex	MMSP Alcott score clock replacement	2025	$40,000
Mold-Masters SportsPlex	MMSP water softener replacement	2025	$35,000
Mold-Masters SportsPlex	MMSP interior lighting upgrades	2026	$500,000
Mold-Masters SportsPlex	MMSP REALice	2026	$82,000
Mold-Masters SportsPlex	MMSP solar PV	2026	$469,000
Mold-Masters SportsPlex	MMSP lighting retrofits	2026	$30,000
Mold-Masters SportsPlex	MMSP boiler plant replacement	2026	$481,875
Mold-Masters SportsPlex	MMSP replace exit lighting fixtures	2028	$60,000
	Mold-Masters SportsPlex total capital measures		**$4,336,875**
Town Hall	Town Hall exterior doors replacement	2025	$13,000
Town Hall	Town Hall window and entrance replace	2025	$557,000
Town Hall	Town Hall lighting, devices, heating	2025	$606,000
Town Hall	Town Hall lighting retrofits	2025	$30,000
Town Hall	Town Hall exterior lighting display	2025	$55,000
Town Hall	Town Hall exhaust fans & ductwork replacement	2025	$125,000
Town Hall	Town Hall geothermal system	2026	$444,000
Town Hall	Town Hall domestic water distribution	2027	$300,000
Town Hall	Town Hall ductwork distribution replacement	2027	$500,000
Town Hall	Town Hall hot water heating distribution replacement	2027	$150,000
Town Hall	Town Hall plumbing fixture replacement	2027	$15,000
Town Hall	Town Hall sink fixture replacement	2027	$33,000
	Town Hall total capital measures		**$2,828,000**
Fire Station District 2	Firehall 2 BAS implementation	2027	$150,000

Fire Station District 2	Firehall 2 lighting retrofits	2028	$30,000
	Fire Station District 2 total capital measures	**27**	**$180,000**
	3 Facilities total capital measures 2025 - 2029		**$7,344,875**

Highlighted measures (in pink) were also identified through site visits, and associated costs are detailed in Section 7.

The following table summarized the capital measures for other Town facilities that have been included in the Town's 10-year capital plan are not included in the energy target reduction.

Table 12 Planned capital measures for other Town facilities (2024 – 2029)

Facility	Project name	Implementation year	New funding required
Acton Arena and Community Centre	Acton Arena replace glycol pump	2025	$15,000
Acton Arena and Community Centre	Acton Arena BAS and controls optimization	2025	$300,000
Acton Arena and Community Centre	Acton Arena low E ceiling	2025	$151,000
Acton Arena and Community Centre	Acton Arena solar PV - D&E	2025	$60,000
Acton Arena and Community Centre	Acton Arena REALice	2025	$41,000
Acton Arena and Community Centre	Acton Arena Townsley score clock replacement	2025	$43,000
Acton Arena and Community Centre	Acton Arena boiler replacements - D&E	2025	$40,000
Acton Arena and Community Centre	Acton Arena lighting retrofits	2026	$30,000
Acton Arena and Community Centre	Acton Arena solar PV	2026	$552,000
Acton Arena and Community Centre	Acton Arena boiler replacements	2026	$300,000
Acton Arena and Community Centre	ACC exterior window and door sealant	2027	$15,000
Acton Arena and Community Centre	Acton Arena roof replacement	2028	$400,000
Acton Arena and Community Centre	Acton Arena Townsley refrigeration replacement	2029	$250,000
	Acton Arena total capital measures		**$2,197,000**
Halton Hills Public Library and Cultural Centre	Cultural Centre front entrance door replacement	2024	$38,000
Halton Hills Public Library and Cultural Centre	Georgetown Library BAS implementation	2025	$150,000
Halton Hills Public Library and Cultural Centre	Georgetown Library lighting retrofits	2026	$30,000
Halton Hills Public Library and Cultural Centre total capital measures			**$218,000**
Gellert Community Centre	GCC roof maintenance	24/25	$750,000
Gellert Community Centre	GCC unit heaters	2025	$48,000
Gellert Community Centre	GCC RTU's	2025	$545,000
Gellert Community Centre	GCC pool filters	2025	$140,000
Gellert Community Centre	GCC replace exhaust fans	2025	$40,000
Gellert Community Centre	GCC lighting retrofits	2025	$42,000
Gellert Community Centre	GCC BAS implementation	2025	$300,000

Facility	Project name	Implementation year	New funding required
Gellert Community Centre	GCC parking lot resurfacing	2025	$400,000
Gellert Community Centre	GCC phase 2 design & engineering	2025	$2,500,000
Gellert Community Centre	GCC phase 2 construction	2028	$40,000
Gellert Community Centre	GCC roof maintenance	2029	$25,000
Gellert Community Centre total capital measures			**$4,830,000**
Robert C. Austin Operations Centre	Robert C. Austin BAS implementation	2026	$300,000
Robert C. Austin Operations Centre	Robert C. Austin lighting retrofits	2026	$30,000
Robert C. Austin Operations Centre total capital measures			**$330,000**
Fire Station District 3	Firehall 3 BAS implementation	2027	$150,000
Fire Station District 3	Firehall 3 lighting retrofits	2028	$30,000
	Fire Station District 3 total capital measures		**$180,000**
Fire Station District 1	Firehall 1 BAS implementation	2027	$150,000
Fire Station District 1	Firehall 1 lighting retrofits	2027	$30,000
	Fire Station District 1 total capital measures		**$180,000**
Public Library - Acton Branch	Acton Library replacement doors	2025	$10,000
Public Library - Acton Branch	Acton Library BAS implementation	2025	$150,000
Public Library - Acton Branch	Acton Library lighting retrofits	2027	$30,000
Public Library - Acton Branch total capital measures			**$190,000**
	Total amount capital measures 2025 - 2029		**$8,125,000**

10 Conclusion

The plan highlights the Town's past success in keeping energy costs constant and establishes an achievable, practical energy conservation target going forward. To achieve this target, the plan identifies low-cost measures for three facilities with high energy saving potential, as well as other potential capital measures. These actions will help better control energy use at the facilities, ensure good conditions for building users and help reduce demand for future capital projects identified through asset management.

Appendix A – Rates, assumptions and conversion factor for energy efficiency measures

Assumptions / Variables	Annual rate
Electricity rate at 1st year ($/kWh)	$0.16
Natural Gas rate at 1st year($/$m^3$)	$0.33
Water rate at 1st($/$m^3$)	$4.30
Electricity incentives ($/kWh)	$0.10
Natural gas incentives ($/$m^3$)	$0.20

Natural gas conversion factor from m3 to ekWh	
1 m^3	10.36 ekWh

Appendix B - Results from the past 5 years (2019-2023) by facility

For the following charts, blue data points represent actual monthly usage while the red data points depict the comparative weather-normalized consumption based on the 2018 baseline. Instances where blue data points fall below red data points indicate energy savings.

Mold-Masters Sportsplex

Table 13 Mold-Masters Sportsplex Energy savings vs 2018 baseline

	2019 ECDM target savings				2023 Actual savings vs 2018 baseline			
	Units	**%**	**$**	**GHG tonnes eCO_2**	**Units**	**%**	**$.**	**GHG tonnes eCO_2**
Electricity (kWh)	849,585	26%	$135,934	17	-246,752	-9.2%	-$39,480	-7
Natural Gas (m³)	125,209	51%	$40,837	240	1,611	0.7%	$532	3
Total Energy (ekWh)	**2,145,503**	**37.1%**	**$176,771**	**257**	**-230,080**	**-4.5%**	**-$38,949**	**-4**
Water (m³)	-	-	-	-	-803	-14.6%	-$3,452	0
Total							**-$42,402**	**-4**

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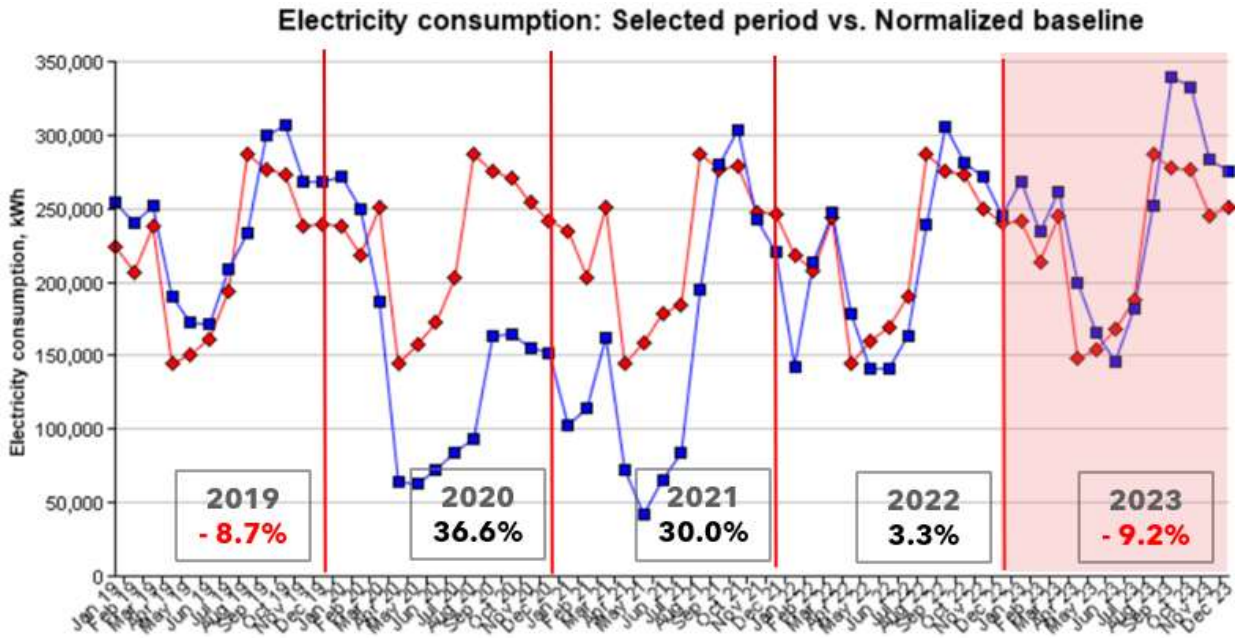

Figure 4 Mold-Masters Sportsplex Electricity consumption (kWh) in 2019-2023 vs 2018 baseline

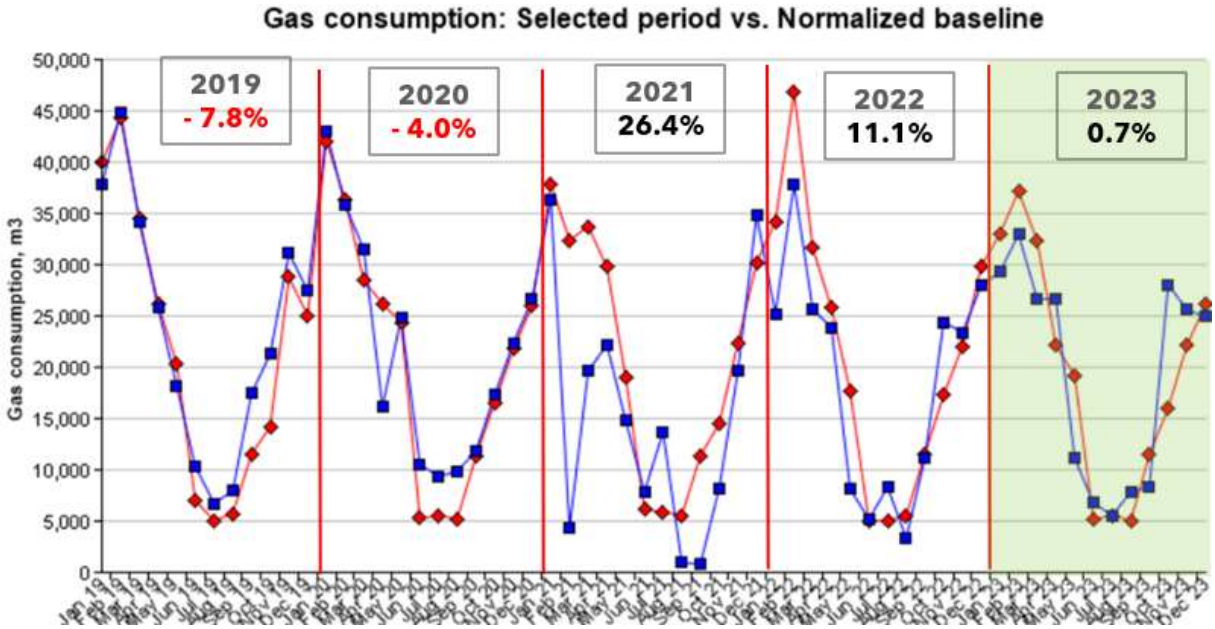

Figure 5 Mold-Masters Sportsplex Natural gas consumption (m3) in 2019-2023 vs 2018 baseline

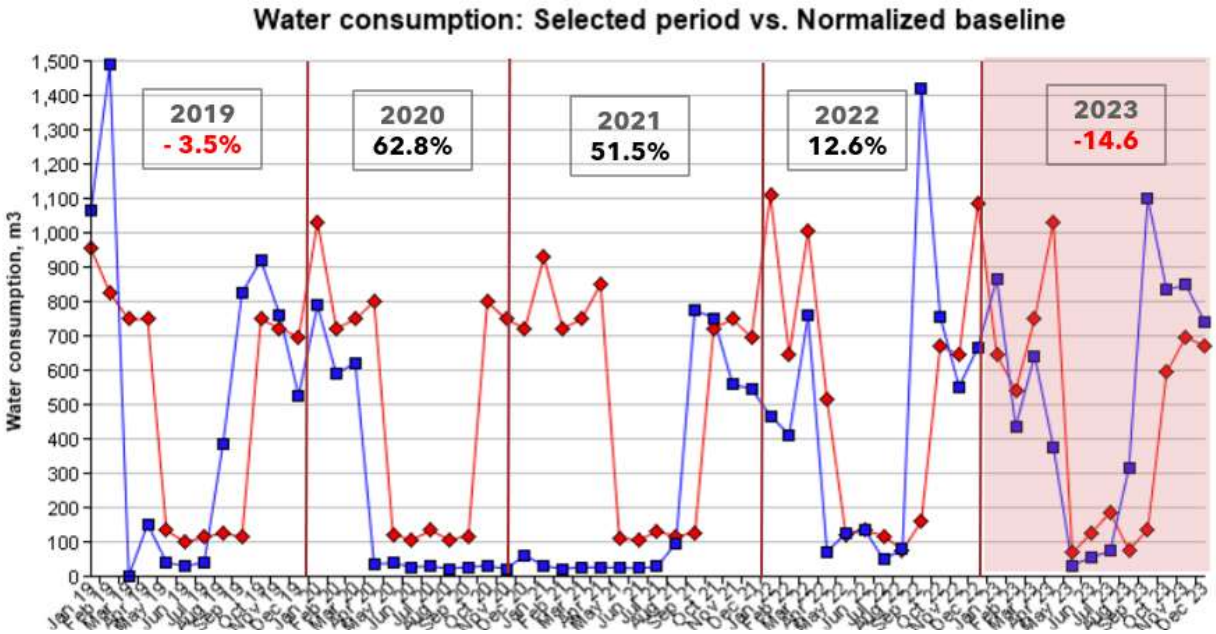

Figure 6 Mold-Masters Sportsplex Water consumption (m3) in 2019-2023 vs 2018 baseline

Acton Arena and Community Centre

Table 14 Acton Area and Community Centre Energy savings vs 2018 baseline

	2019 ECDM target savings				2023 Actual savings vs 2018 baseline			
	Units	**%**	**$**	**GHG**	**Units**	**%**	**$**	**GHG**
Electricity (kWh)	52,832	4%	$8,453	1	-232,533	-18.9 %	$-37,205	-7
Natural Gas (m³)	53,066	42%	$14,235	102	-25,586	-21.7%	$-4,094	-49
Total Energy (ekWh)	**602,060**	**22.3%**	**$22,688**	**103**	**-497,348**	**-20.3%**	**$-41,299**	**-56**
Water (m³)	-	-	-	-	3,010	64.3%	$12,943	0
Total							**$-28,356**	**-56**

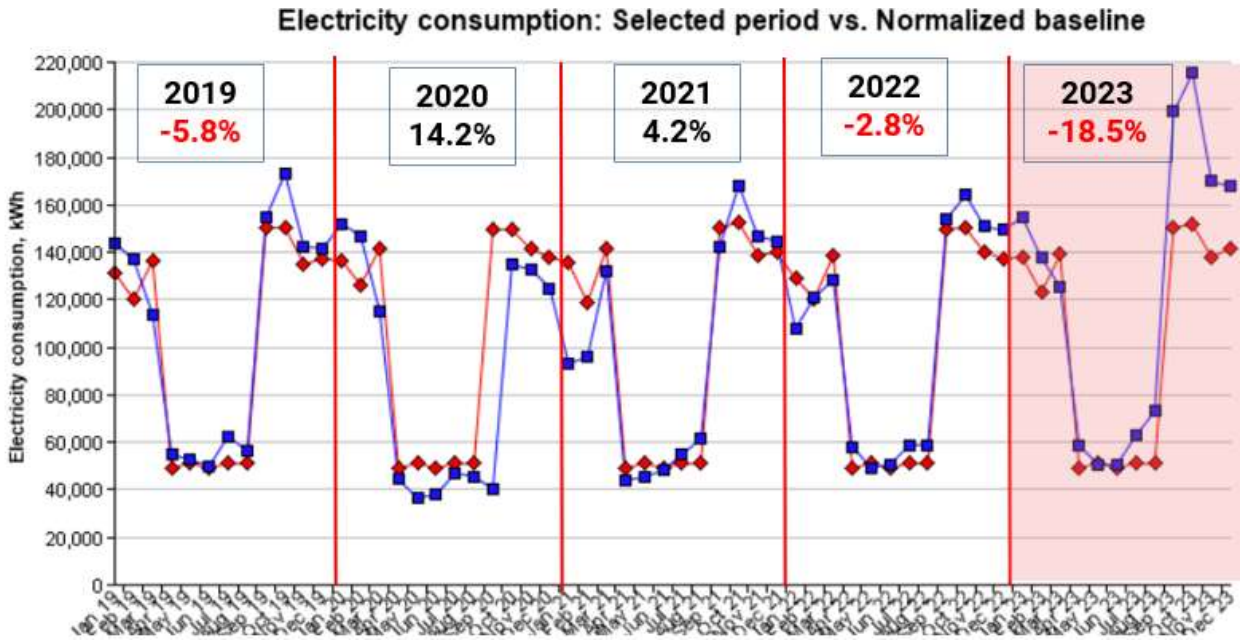

Figure 7 Acton Arena & Community Centre Electricity consumption (kWh) in 2019-2023 vs 2018 baseline

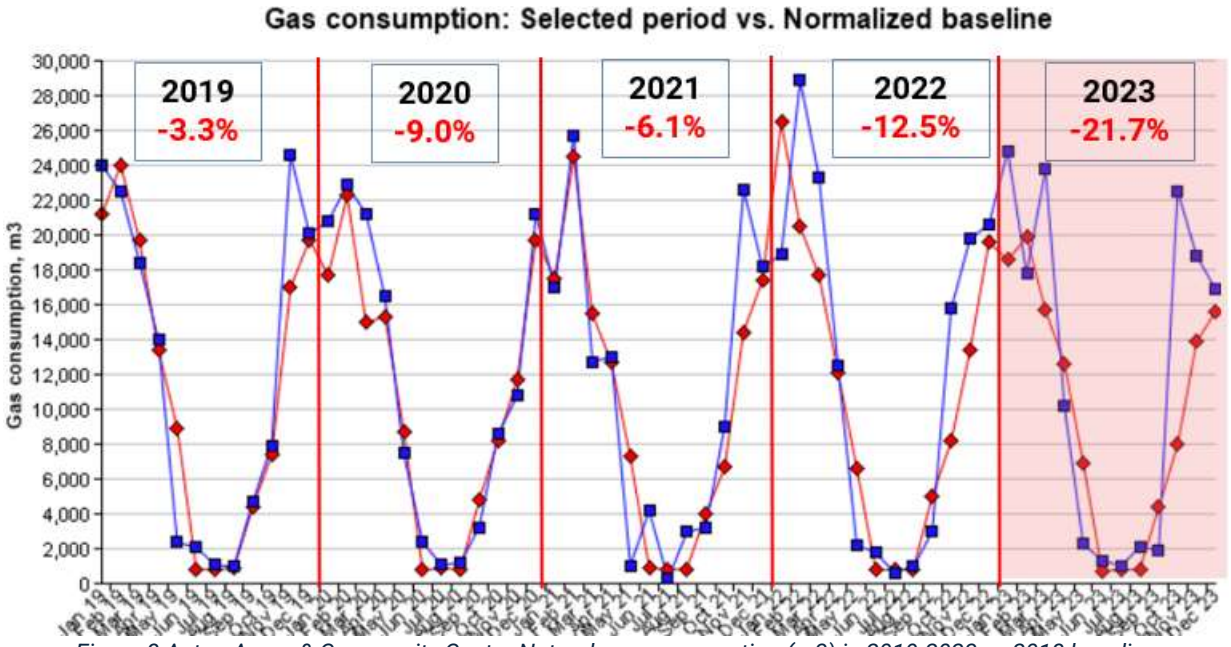

Figure 8 Acton Arena & Community Centre Natural gas consumption (m3) in 2019-2023 vs 2018 baseline

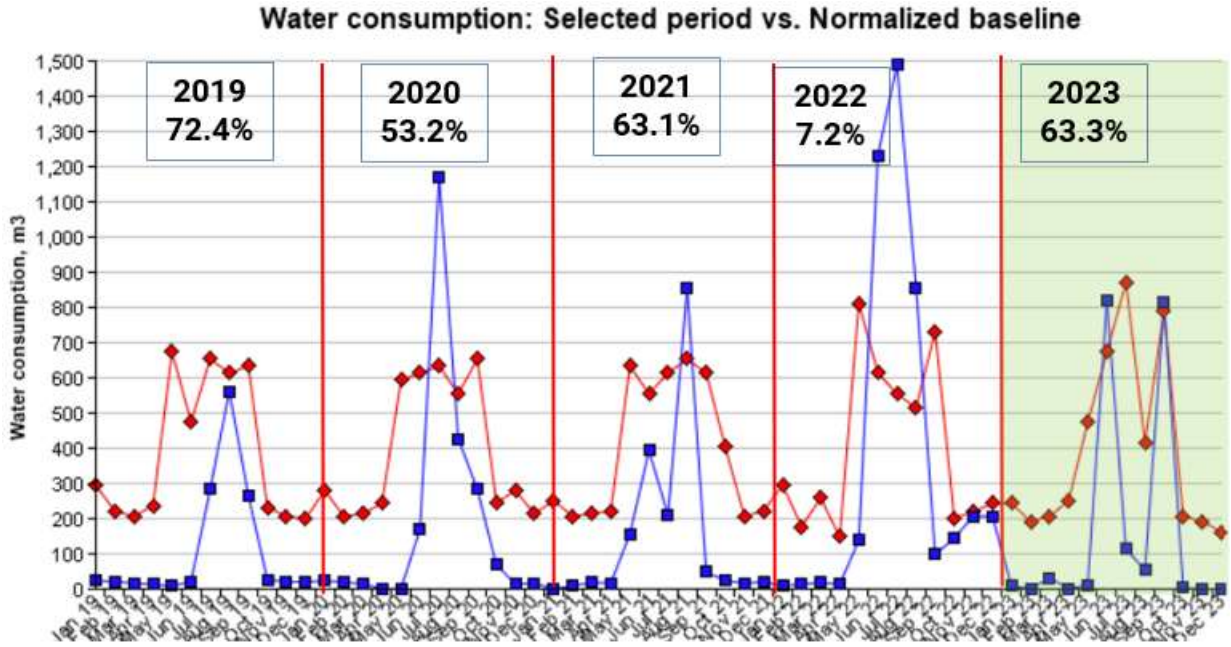

Figure 9 Acton Arena & Community Centre Water consumption (m3) in 2019-2023 vs 2018 baseline

Halton Hills Public Library and Cultural Centre

Table 15 Halton Hills Public Library and Cultural Centre Energy savings vs 2018 baseline

	2019 ECDM target savings				2023 Actual savings vs 2018 baseline			
	Units	**%**	**$**	**GHG tonnes eCO_2**	**Units**	**%**	**$**	**GHG tonnes eCO_2**
Electricity (kWh)	237,234	33%	$37,957	4	48,814	7.1%	$7,810	1
Natural Gas (m^3)	1,855	58%	$2,852	4	1,011	0.3%	$162	2
Total Energy (ekWh)	**256,430**	**34.2%**	**$40,809**	**8**	**59,278**	**8.3%**	**$7,972**	**3**
Water (m^3)	-	-	-	-	119	15.3%	$512	0
Total							**$8,484**	**3**

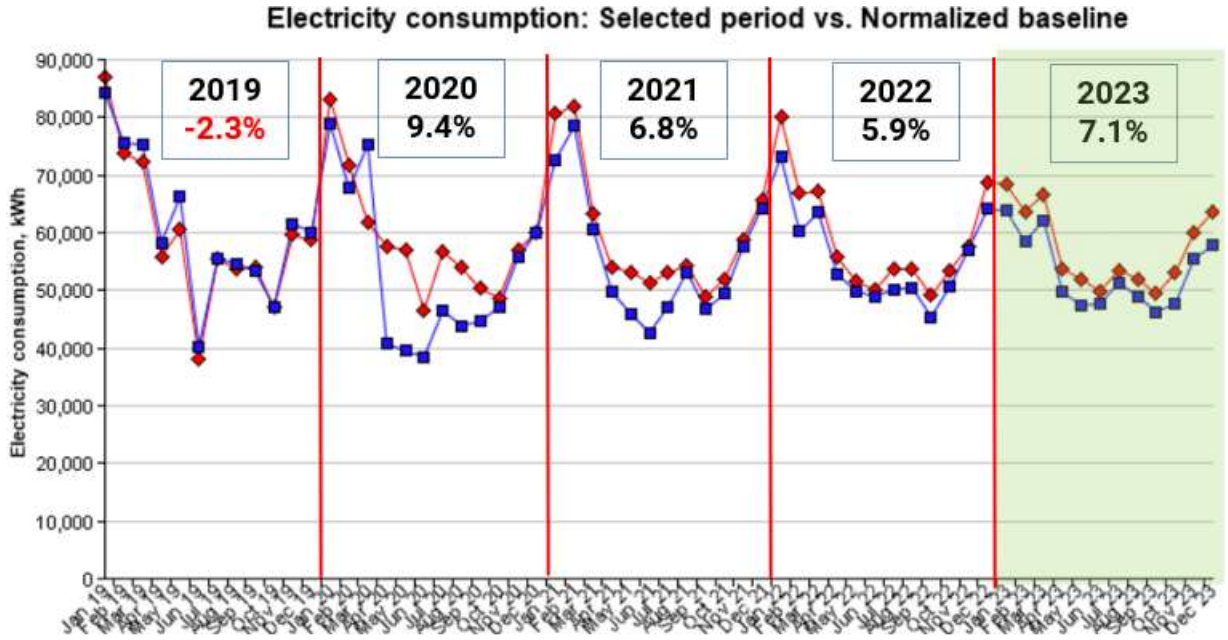

Figure 10 Halton Hills Public Library and Cultural Centre consumption (kWh) in 2019-2023 vs 2018 baseline

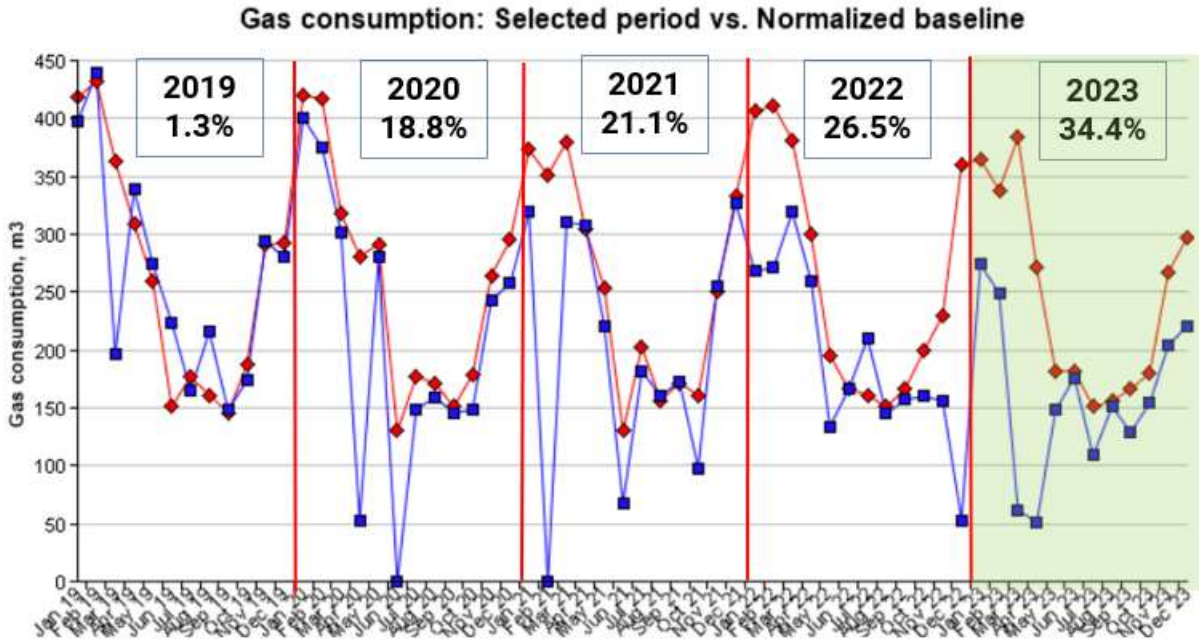

Figure 11 Halton Hills Public Library and Cultural Centre Natural gas consumption (m3) in 2019-2023 vs 2018 baseline

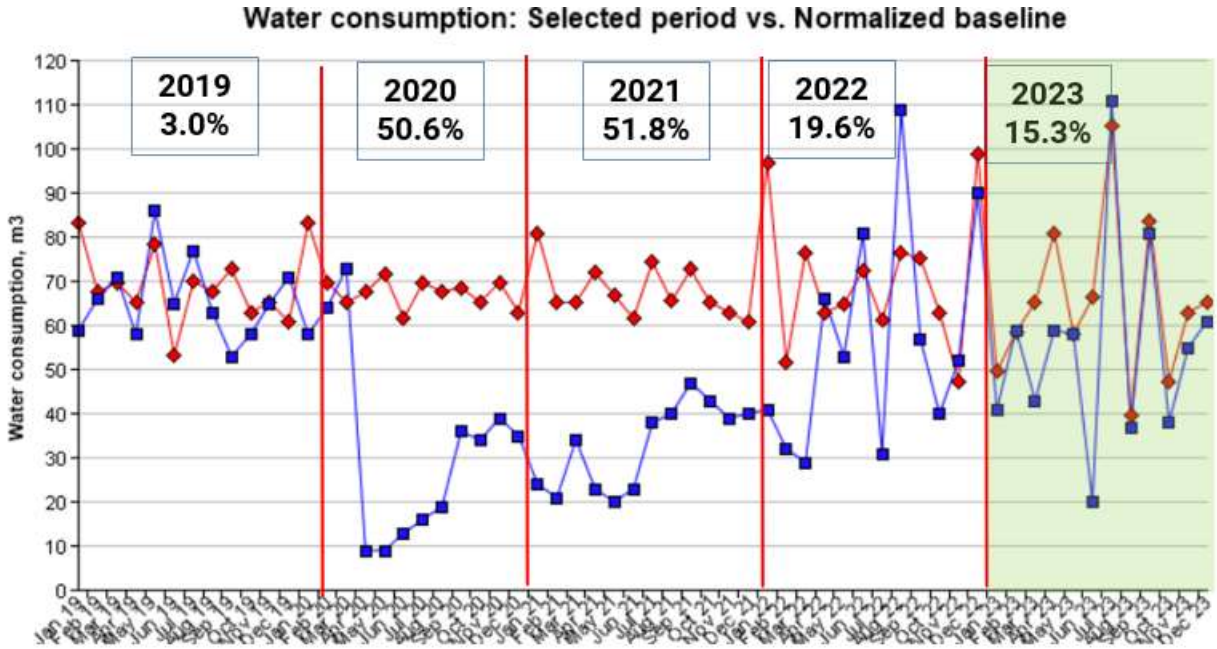

Figure 12 Halton Hills Public Library and Cultural Centre Water consumption (m3) in 2019-2023 vs 2018 baseline

Halton Hills Town Hall

Table 16 Town Hall Energy savings vs 2018 baseline

	2019 ECDM target savings				Actual savings 2023 vs 2018 baseline			
	Units	**%**	**$**	**GHG**	**Units**	**%**	**$**	**GHG**
Electricity (kWh)	177,247	30%	$28,359	3	55,828	10.2%	$8,932	2
Natural Gas (m³)	10,382	36%	$4,455	20	-4,539	-19.9%	-$1,498	-9
Total Energy (ekWh)	**284,702**	**32.1%**	**$32,814**	**23**	**8,852**	**1.1%**	**$7,435**	**-7**
Water (m³)	-	-	-	-	270	21.0%	$1,161	0
Total							**$8,596**	**-7**

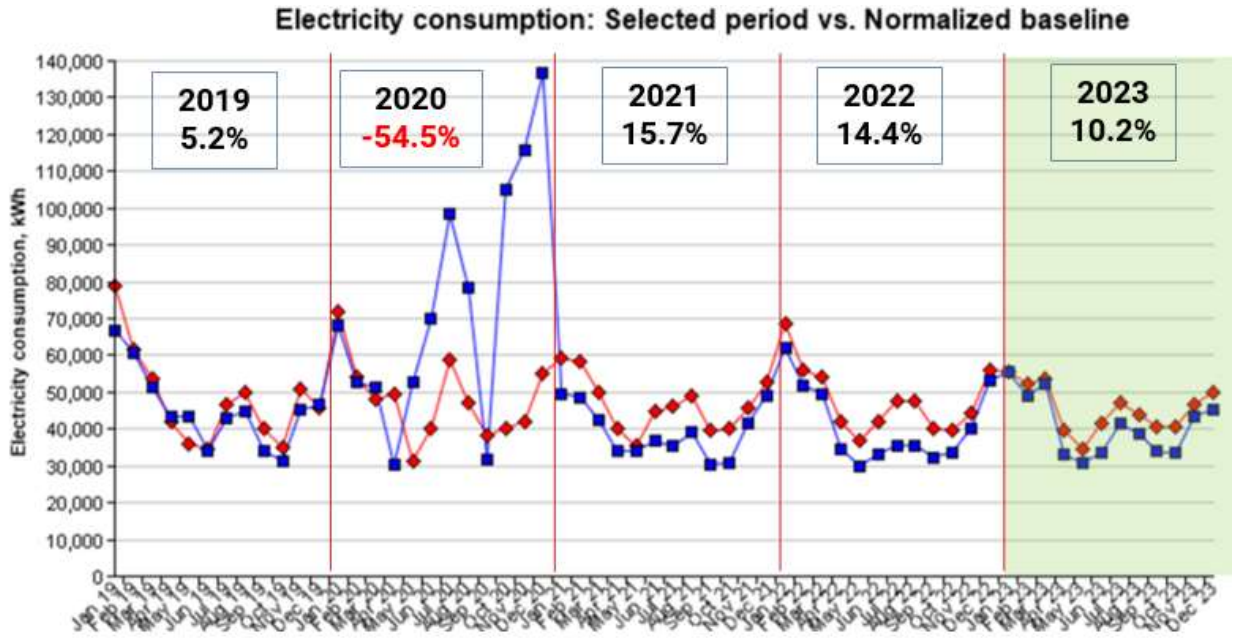

Figure 13 Town Hall Electricity consumption (kWh) in 2019-2023 vs 2018 baseline

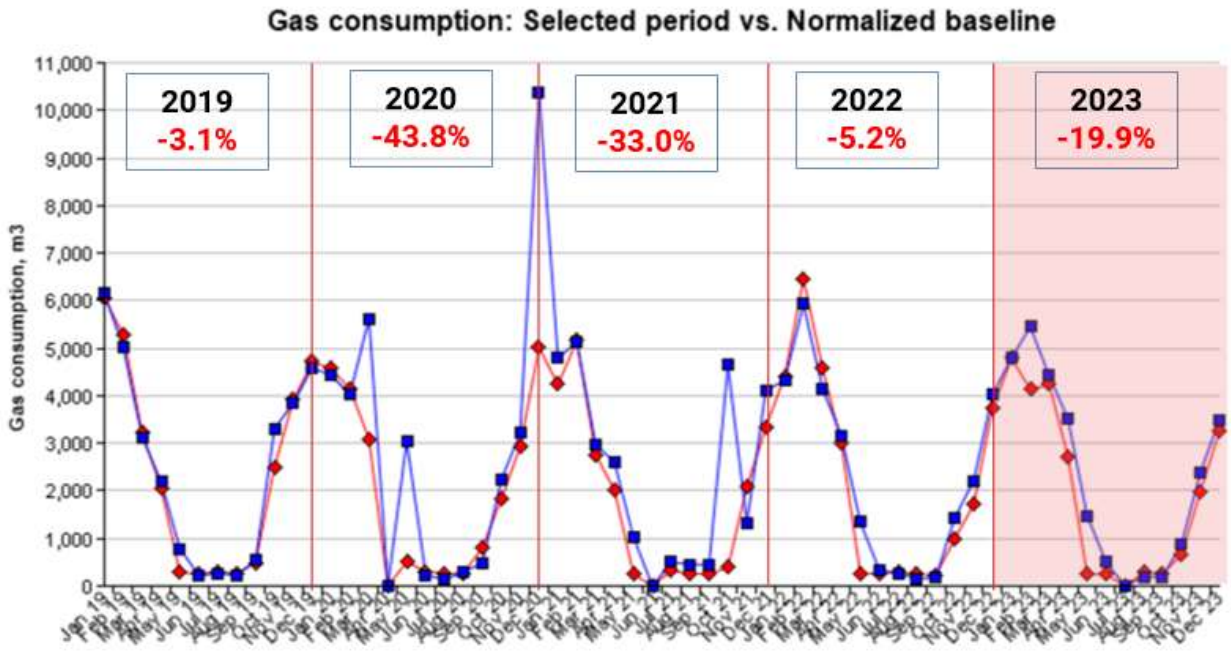

Figure 14 Town Hall Natural gas consumption (m3) in 2019-2023 vs 2018 baseline

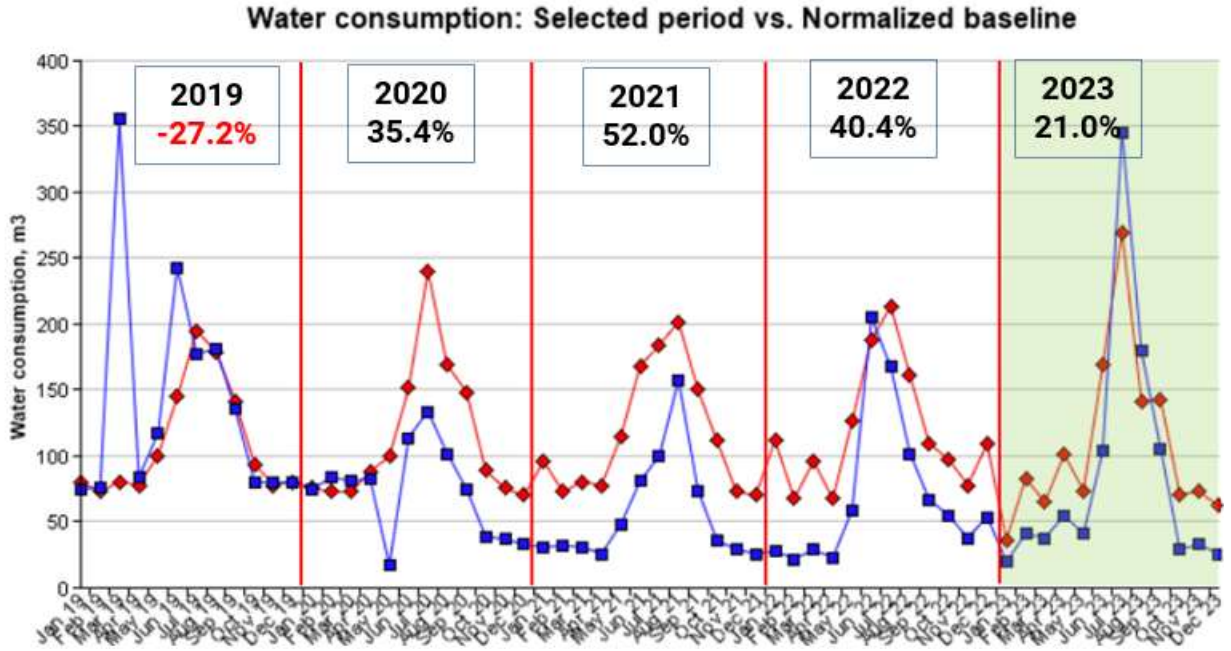

Figure 15 Town Hall Water consumption (m3) in 2019-2023 vs 2018 baseline

Gellert Community Centre

Table 17 Gellert Community Centre Energy savings vs 2018 baseline

	2019 ECDM target savings				2023 Actual savings vs 2018 baseline			
	Units	**%**	**$**	**GHG tonnes eCO_2**	**Units**	**%**	**$**	**GHG tonnes eCO_2**
Electricity (kWh)	0	0%	$0	0	13,168	1.6%	$2,107	0
Natural Gas (m³)	106,495	49%	$27,508	204	-7,954	-3.9%	$-1,273	-15
Total Energy (ekWh)	**1,102,219**	**35.9%**	**$27,508**	**204**	**-69,156**	**-2.3%**	**$834**	**-15**
Water (m³)	-	-	-	-	1,074	14.3%	$4,618	0
Total					-		**$5,452**	**-15**

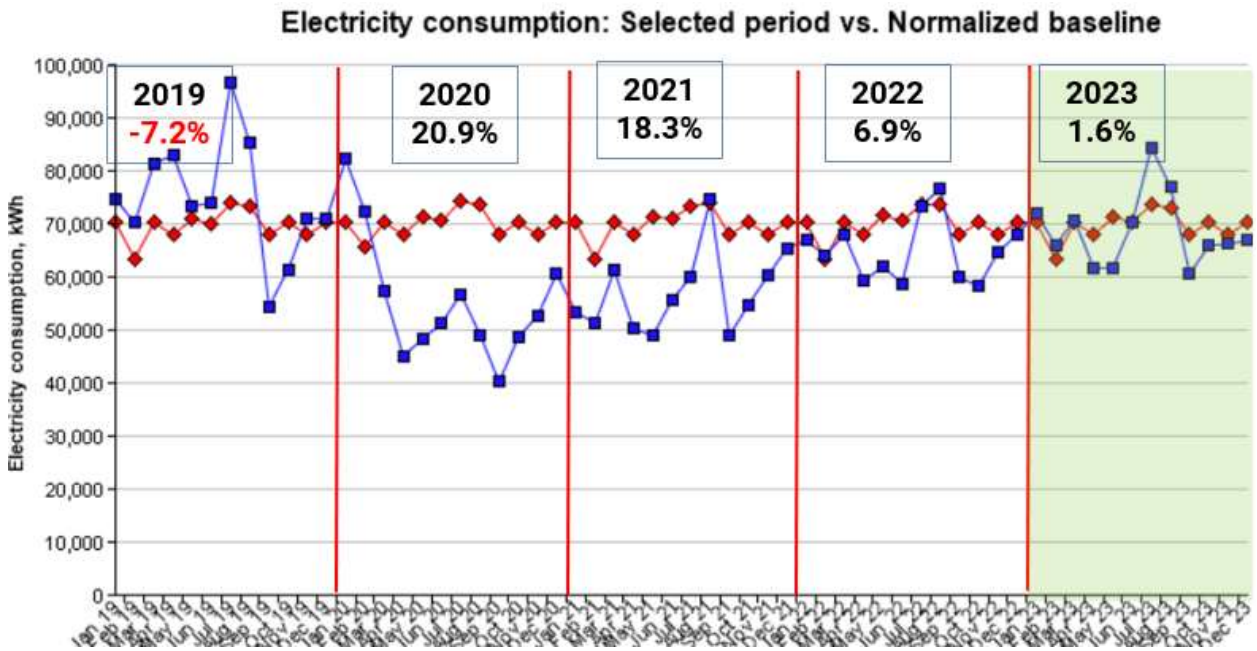

Figure 16 Gellert Community Centre Electricity consumption (kWh) in 2019-2023 vs 2018 baseline

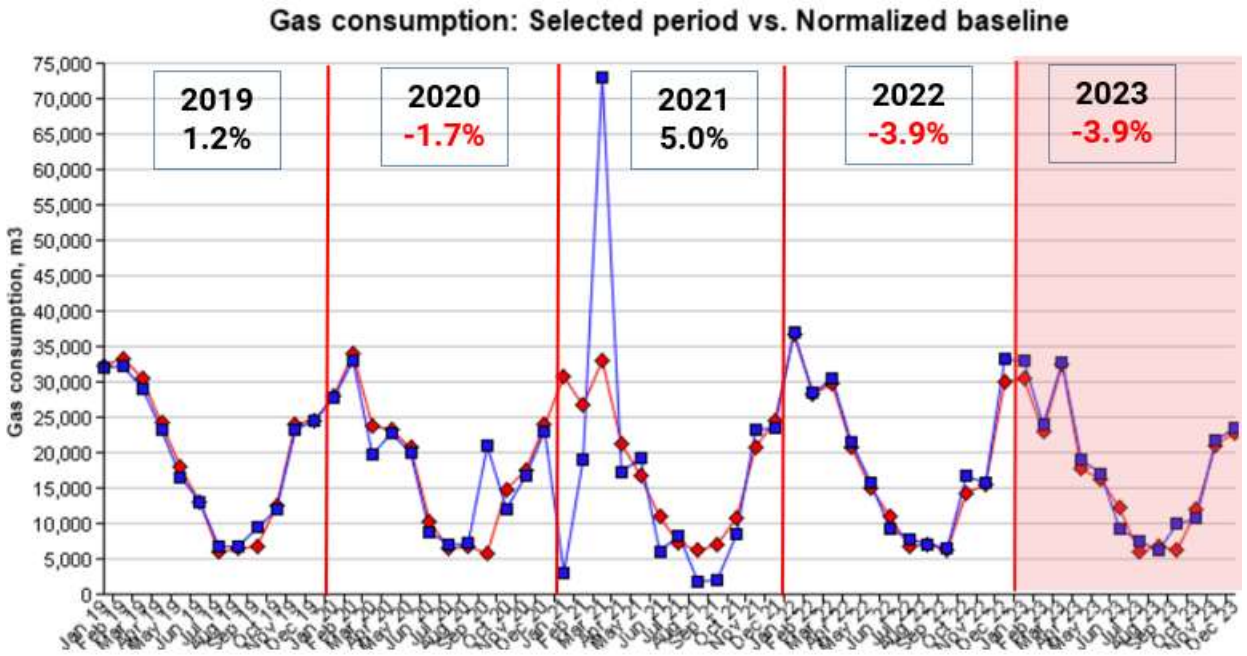

Figure 17 Gellert Community Centre Natural gas consumption (m3) in 2019-2023 vs 2018 baseline

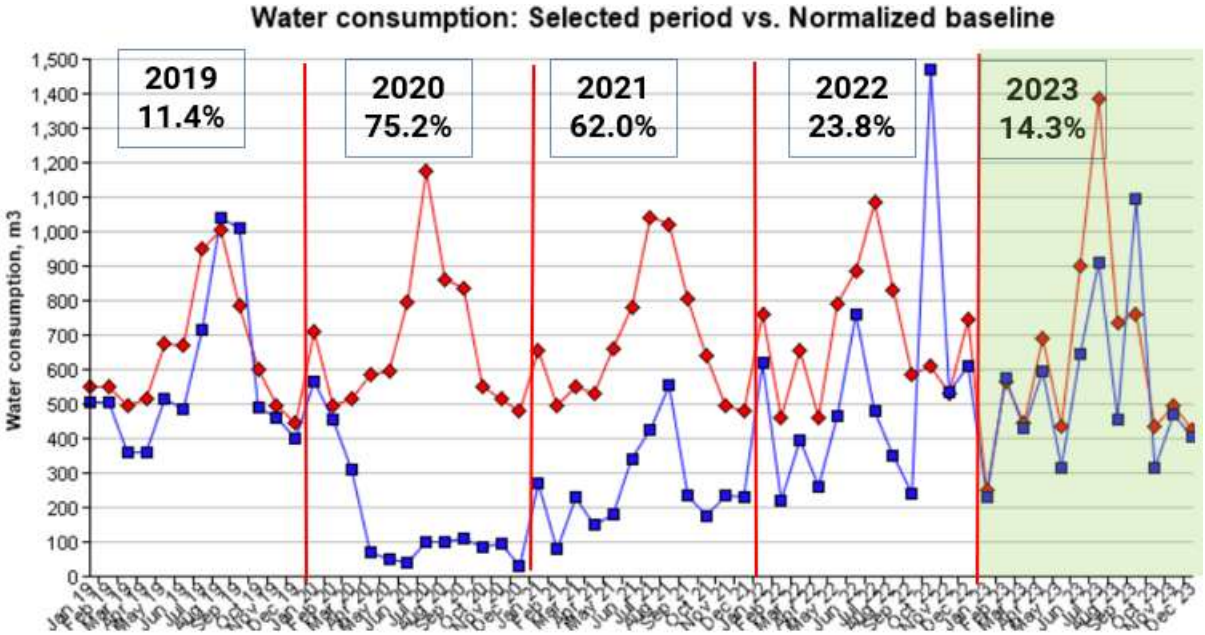

Figure 18 Gellert Community Centre Water consumption (m3) in 2019-2023 vs 2018 baseline

Robert Austion Operation Centre

Table 18 Robert Austin Operation Centre Energy savings vs 2018 baseline

	2019 ECDM target savings				2023 Actual savings vs 2018 baseline			
	Units	**%**	**$**	**GHG tonnes eCO_2**	**Units**	**%**	**$**	**GHG tonnes eCO_2**
Electricity (kWh)	190,575	45%	$30,492	3	-43,380	-10.7%	$-6,941	-1
Natural Gas (m^3)	28,481	33%	$9,262	55	-3,277	-4.6%	$-524	-6
Total Energy (ekWh)	**485,350**	**36.5%**	**$39,754**	**58**	**-77,297**	**-6.8%**	**$-7,465**	**-7**
Water (m^3)	-	-	-	-	-200	-58.6%	$-860	0
Total							**$-8,325**	**-7**

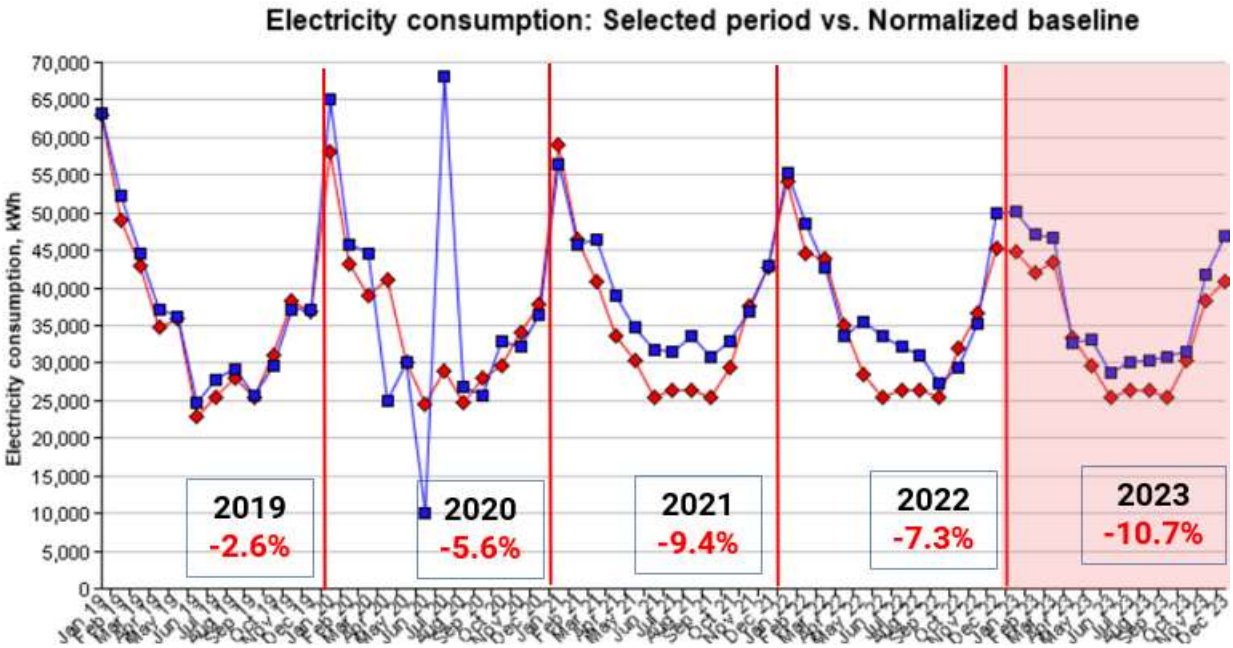

Figure 19 Robert Austin Operation Centre Electricity consumption (kWh) in 2019-2023 vs 2018 baseline

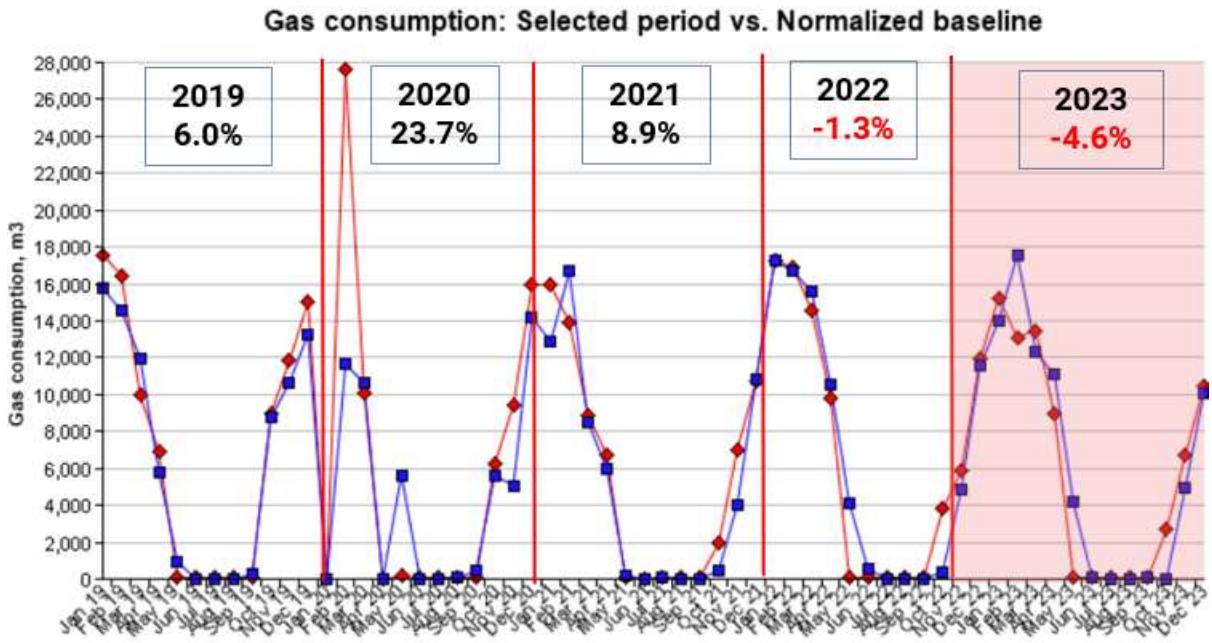

Figure 20 Robert Austin Operation Centre Natural gas consumption (m3) in 2019-2023 vs 2018 baseline

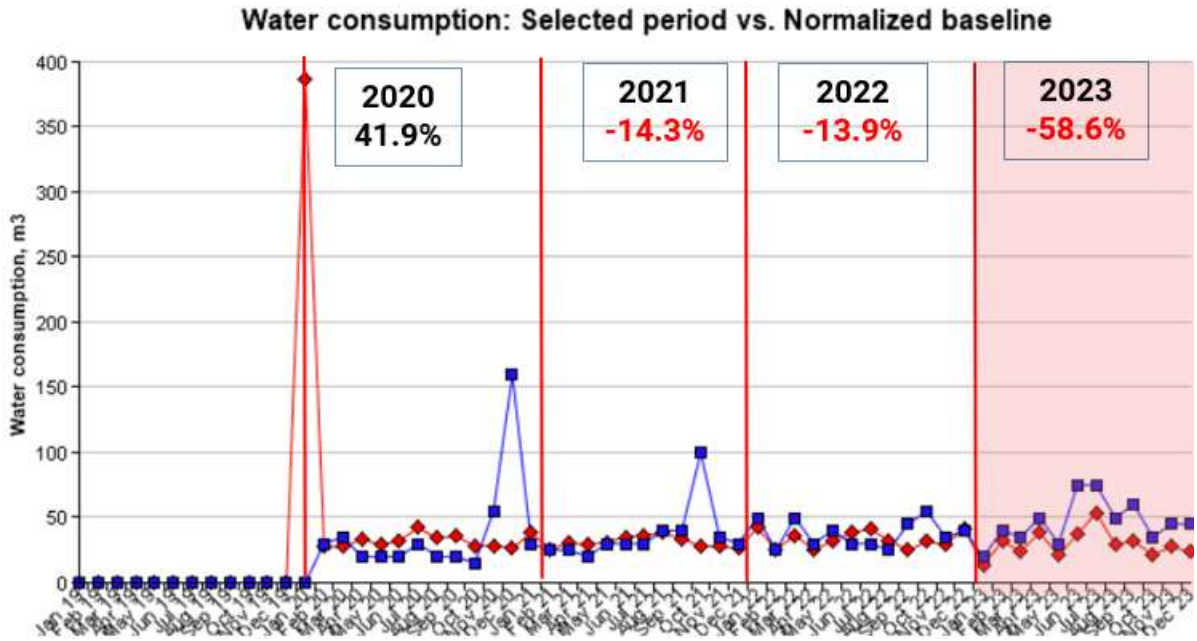

Figure 21 Robert Austin Operation Centre Water consumption (m3) in 2019-2023 vs 2018 baseline

Fire Station - District 2

Table 19 Fire Station - District 2 Energy savings vs 2018 baseline

	2019 ECDM target savings				Actual savings (2023 vs 2019 baseline)			
	Units	**%**	**$**	**GHG tonnes eCO_2**	**Units**	**%**	**$**	**GHG tonnes eCO_2**
Electricity (kWh)	111,695	47%	$17,871	2	-8,871	-4.0%	-$1,419	-0
Natural Gas (m³)	12,572	87%	$4,365	24	-4,009	-35.1%	-$1,323	-8
Total Energy (ekWh)	**241,818**	**62.9%**	**$22,236**	**26**	**-50,363**	**-14.7%**	**-$2,742**	**-8**
Water (m³)	-	-	-	-	-237	-145.3%	$-1,020	0
Total							**$3,762**	**-8**

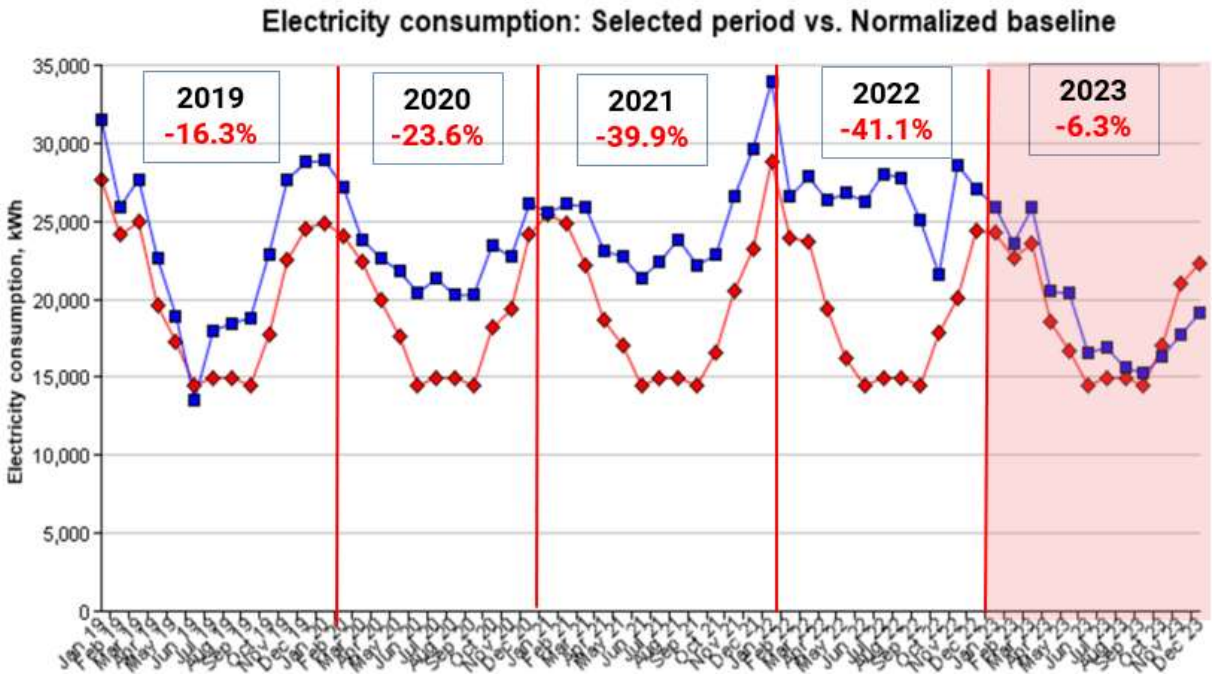

Figure 22 Fire Station – District 2 Electricity consumption (kWh) in 2019-2023 vs 2018 baseline

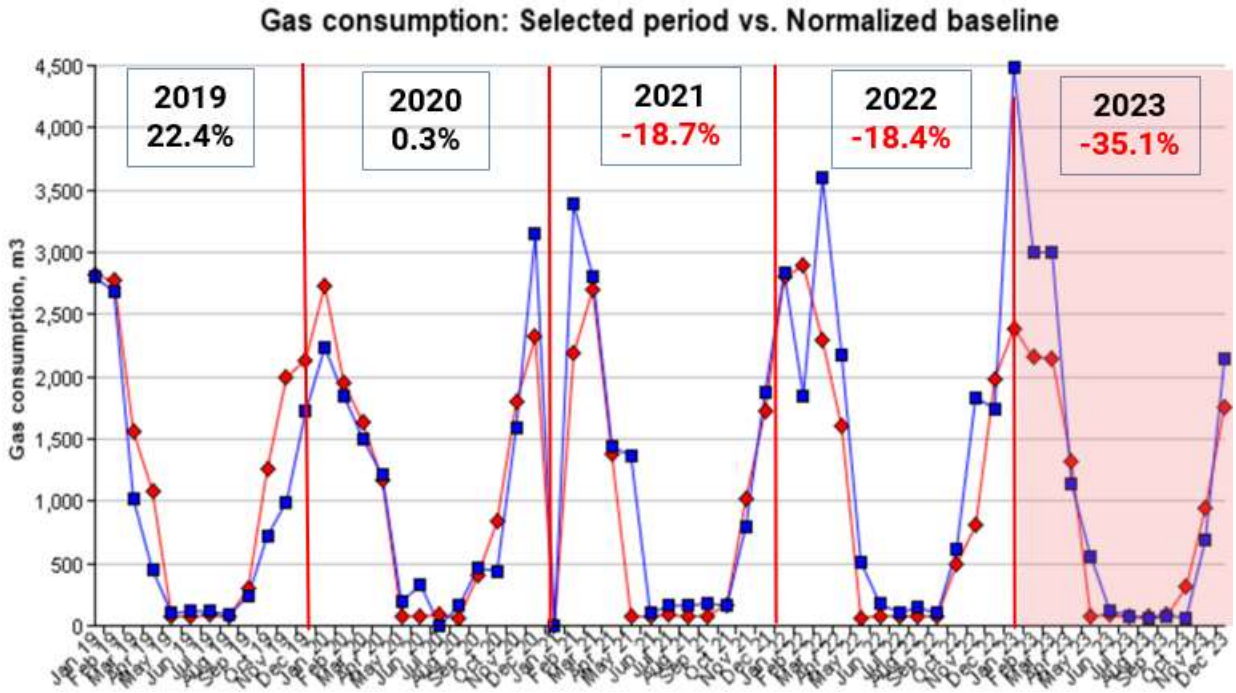

Figure 23 Fire Station – District 2 Natural gas consumption (m3) in 2019-2023 vs 2018 baseline

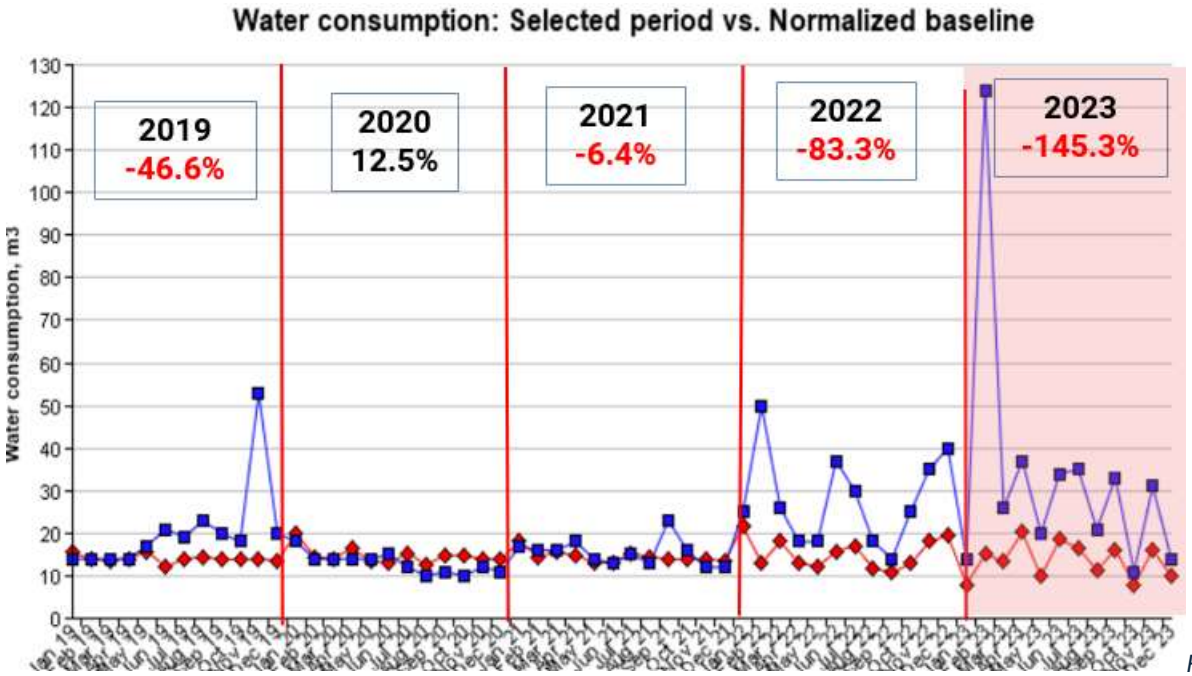

Figure 24 Fire Station – District 2 Water consumption (m3) in 2019-2023 vs 2018 baseline

Fire Station - District 3 HQ

Table 20 Fire Station 3 HQ Energy savings vs 2018 baseline

	2019 ECDM target savings				Actual savings 2023 vs 2018 baseline)			
	Units	**%**	**$**	**GHG tonnes eCO_2**	**Units**	**%**	**$**	**GHG tonnes eCO_2**
Electricity (kWh)	121,362	53%	$19,418	3	33,323	15.4%	$5,332	1
Natural Gas (m³)	5,945	79%	$2,749	11	-1,876	-29.9%	-$619	-4
Total Energy (ekWh)	**182,892**	**60%**	**$22,167**	**14**	**13,906**	**4.9%**	**$4,713**	**-3**
Water (m³)	-	-	-		**-100**	**-44.5%**	-$430	0
Total							**$4,283**	**-3**

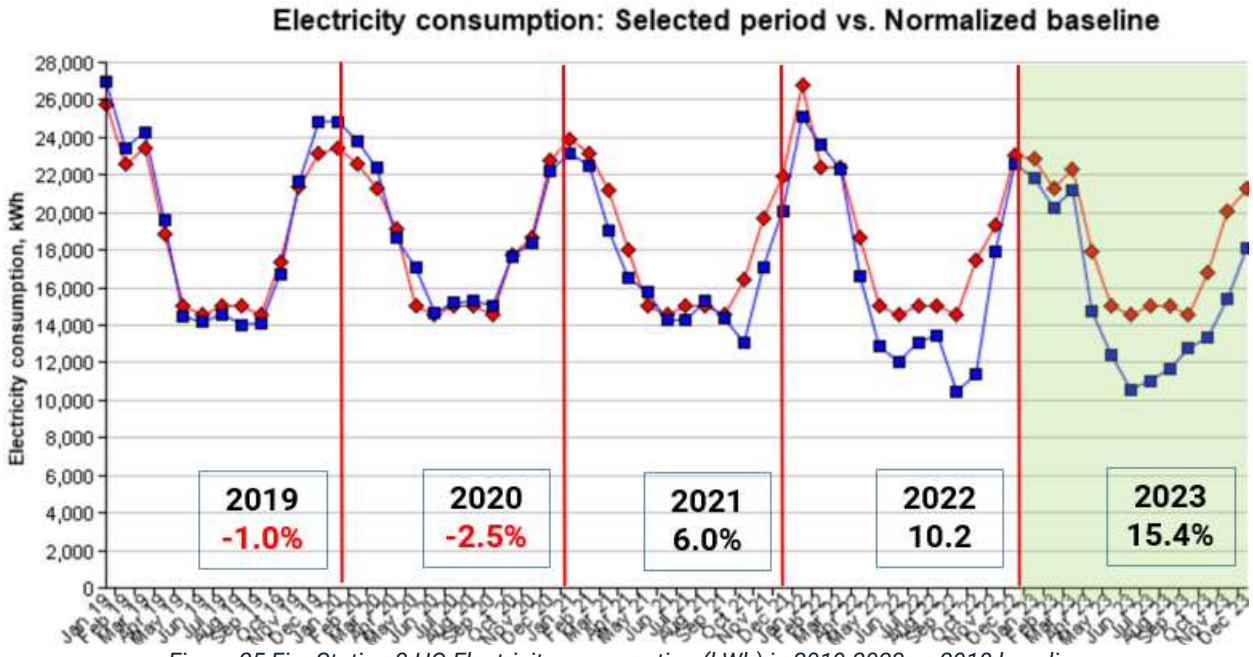

Figure 25 Fire Station 3 HQ Electricity consumption (kWh) in 2019-2023 vs 2018 baseline

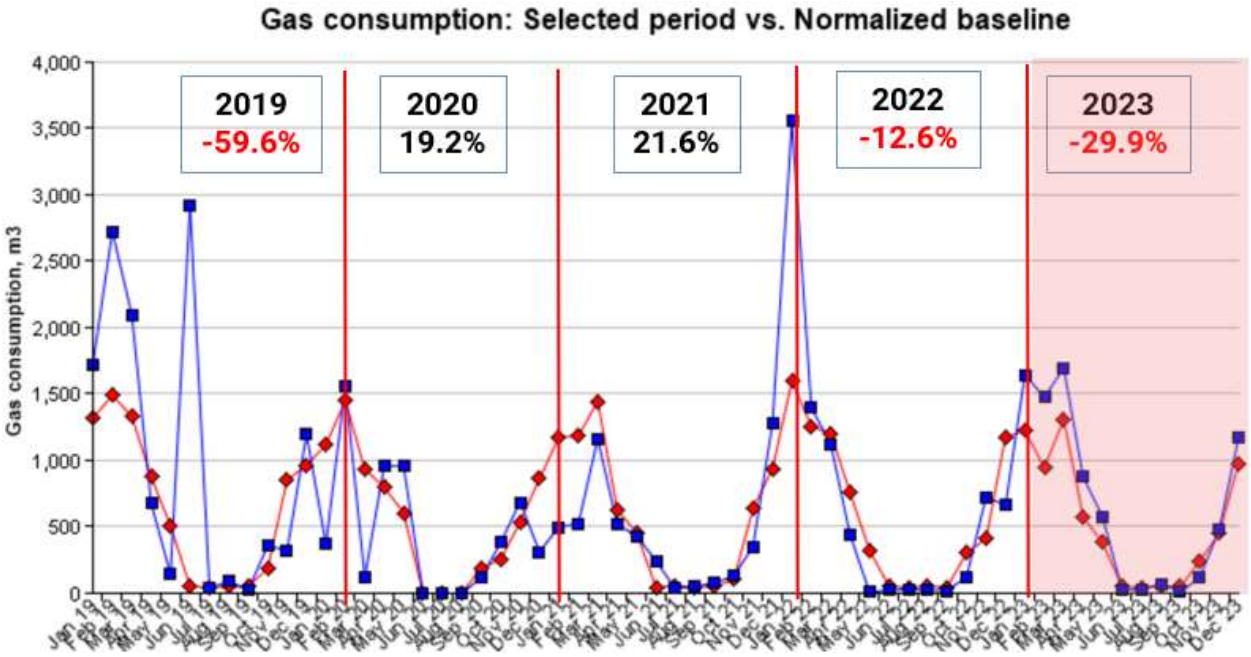

Figure 26 Fire Station 3 HQ Natural gas consumption (m3) in 2019-2023 vs 2018 baseline

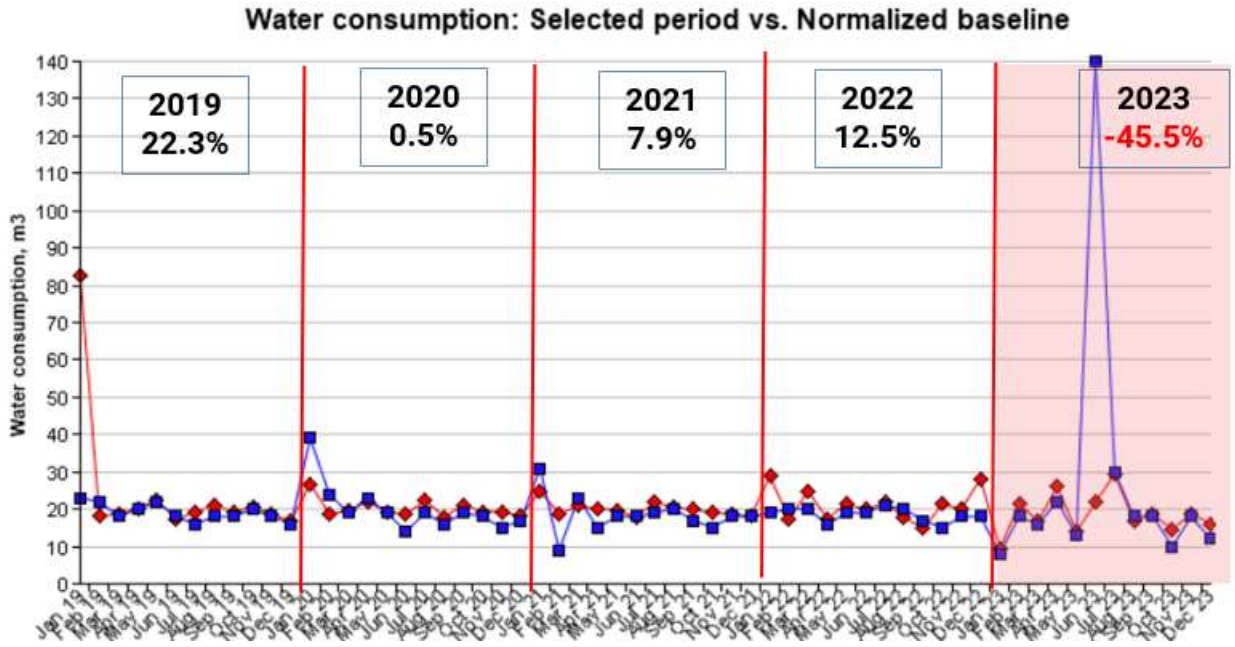

Figure 27 Fire Station 3 HQ Water consumption (m3) in 2019-2023 vs 2018 baseline

Cedarvale Community Centre

Table 21 Cedarvale Community Centre Energy savings vs 2018 baseline

	2019 ECDM target savings				Actual savings 2023 vs 2018 baseline			
	Units	**%**	**$**	**GHG tonnes eCO_2**	**Units**	**%**	**$**	**GHG tonnes eCO_2**
Electricity (kWh)	0	0%	$0	0	-3,015	-18.6%	$-482	0
Natural Gas (m^3)	5,498	39%	$1,420	11	-152	-1.3%	$-24	0
Total Energy (ekWh)	**56,908**	**35%**	**$1,420**	**11**	**-4,588**	**-3.2%**	**$-507**	**0**

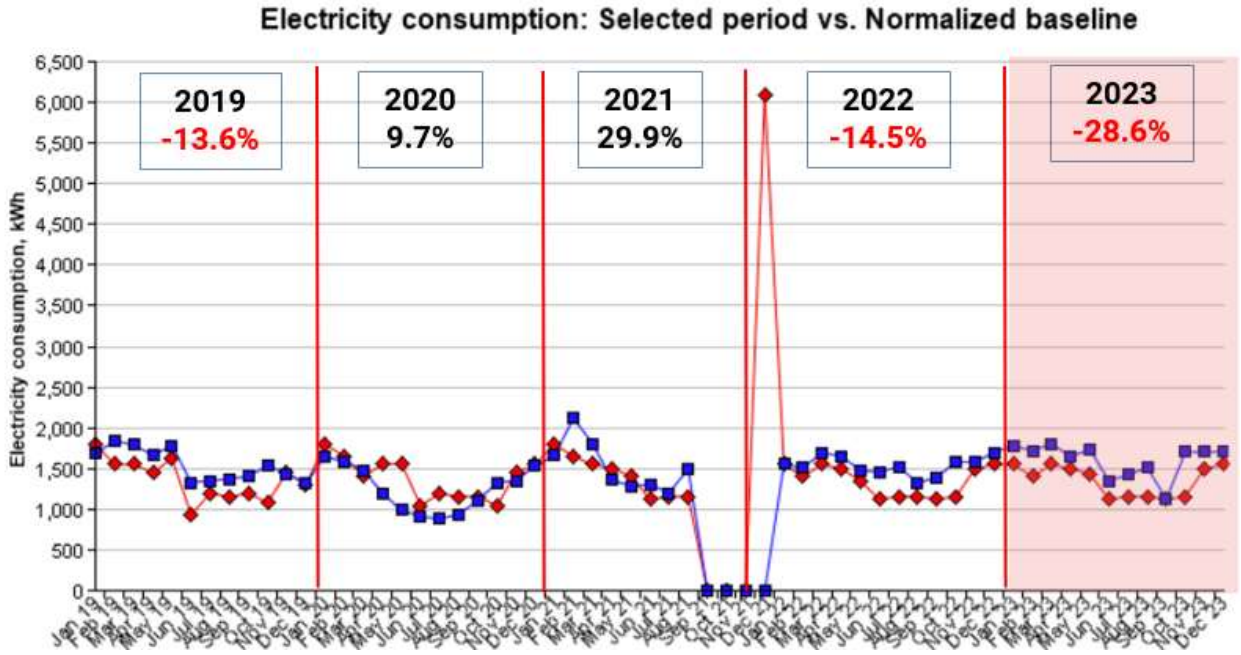

Figure 28 Cedarvale Community Centre Electricity consumption (kWh) in 2019-2023 vs 2018 baseline

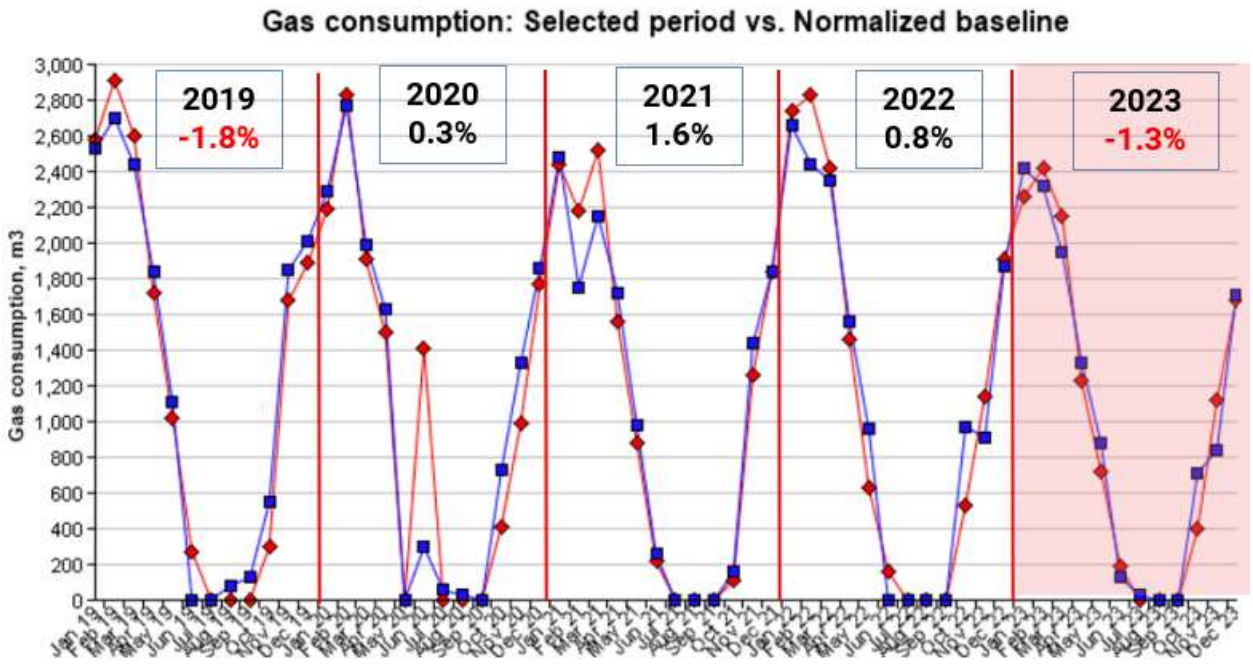

Figure 29 Cedarvale Community Centre Natural gas consumption (m3) in 2019-2023 vs 2018 baseline

Fire Station - District 1

Table 22 Fire Station - District 1Energy savings vs 2018 baseline

	2019 ECDM target savings				Actual savings 2023 vs 2018 baseline			
	Units	**%**	**$**	**GHG tonnes eCO_2**	**Units**	**%**	**$**	**GHG tonnes eCO_2**
Electricity (kWh)	47,180	35%	$7,549	2	36,992	28.4%	$5,919	1
Natural Gas (m^3)	17,537	77%	$5,001	34	1,776	9.6%	$284	3
Total Energy (ekWh)	**228,684**	**62%**	**$12,550**	**36**	**55,374**	**17.2%**	**$6,203**	**4**
Water (m^3)	-	-	-		-667	-269%	$-2,868	0
Total							**$3,335**	**4**

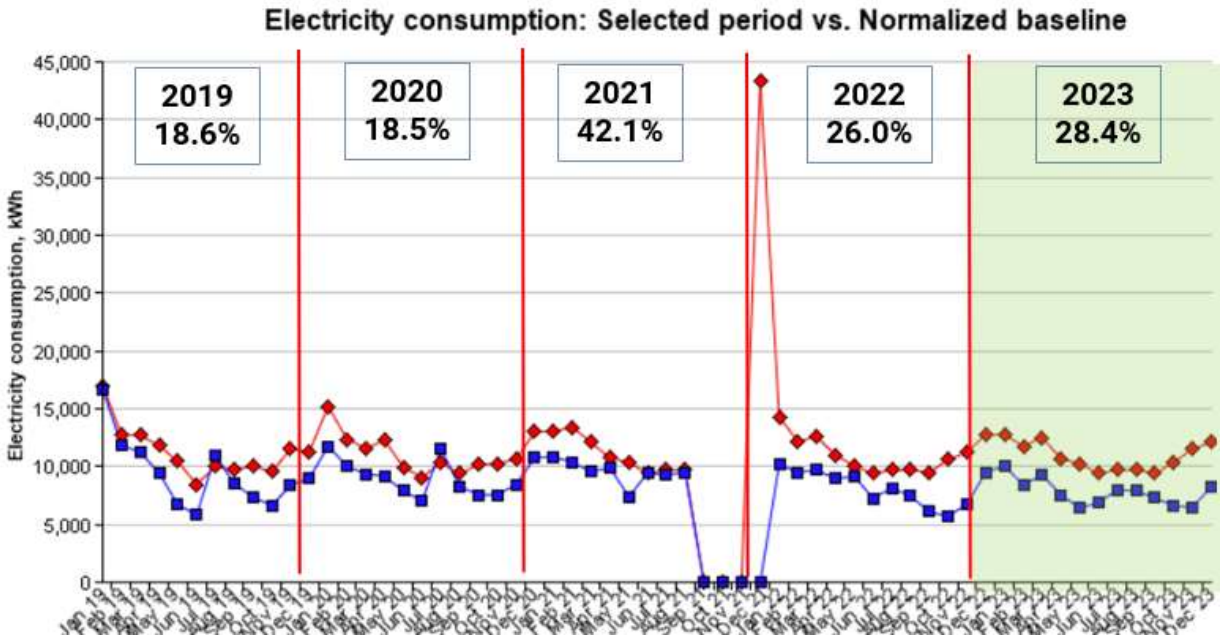

Figure 30 Fire Station – District 1 Electricity consumption (kWh) in 2019-2023 vs 2018 baseline

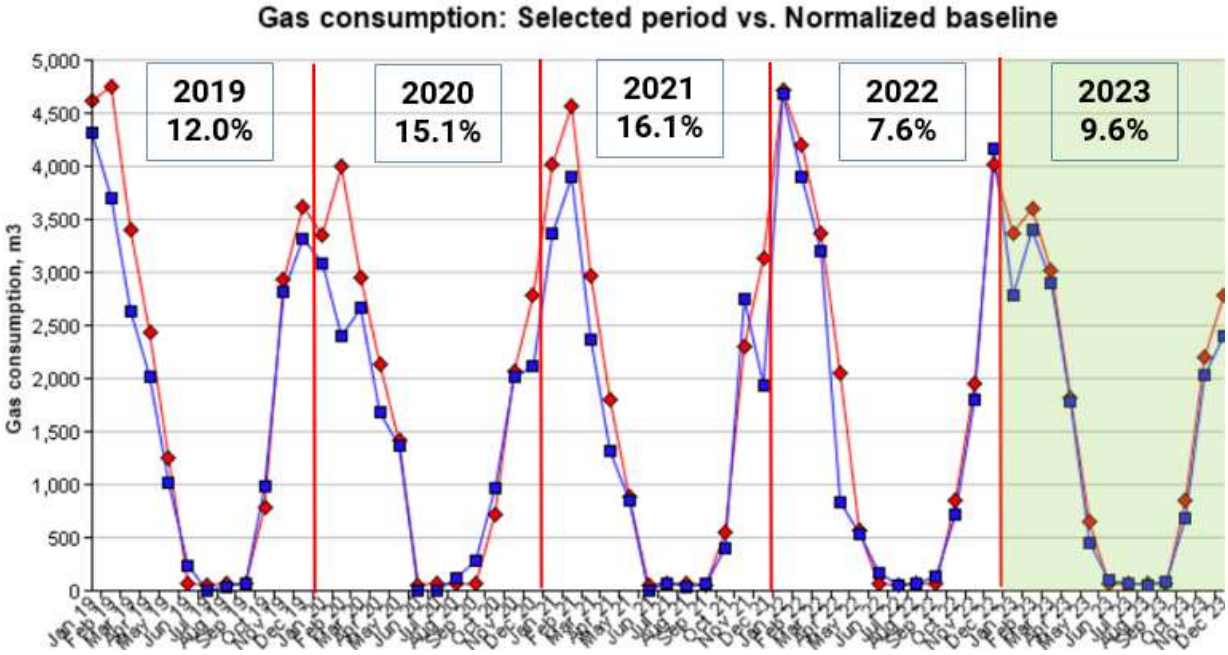

Figure 31 Fire Station – District 1 Natural gas consumption (m3) in 2019-2023 vs 2018 baseline

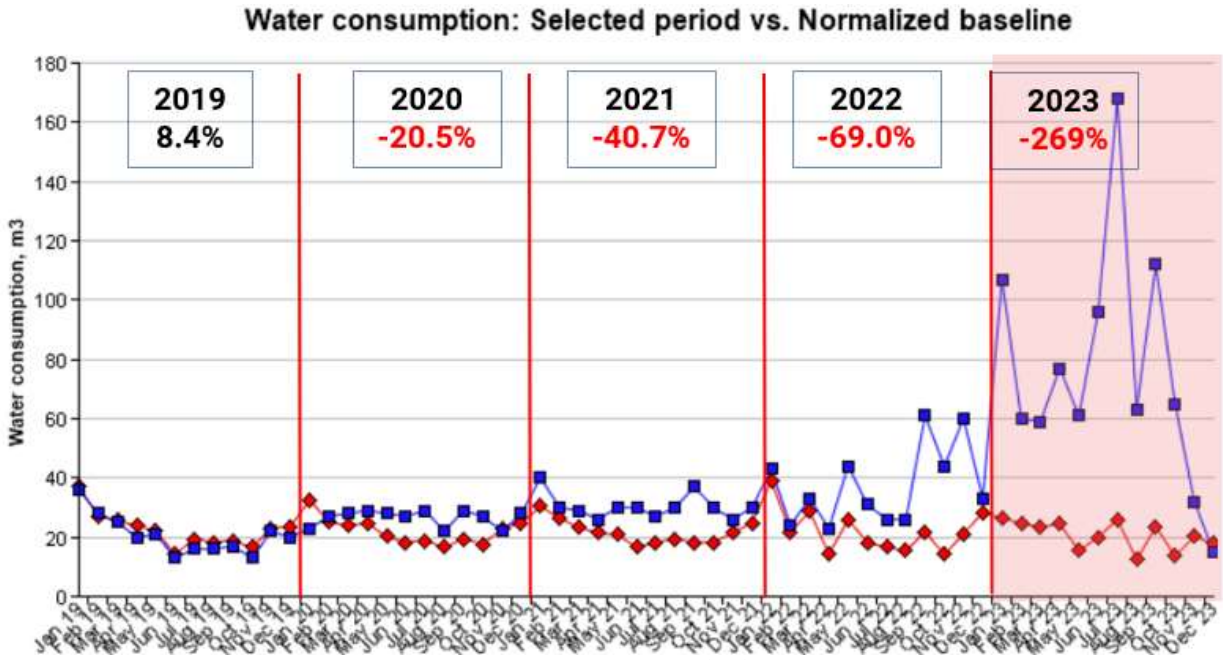

Figure 32 Fire Station – District 1 Water consumption (m3) in 2019-2023 vs 2018 baseline

Public Library - Acton Branch

Table 23 Public Library - Acton Branch Energy savings vs 2018 baseline

	2019 ECDM target savings				Actual savings 2023 vs 2018 baseline			
	Units	**%**	**$**	**GHG tonnes eCO_2**	**Units**	**%**	**$**	**GHG tonnes eCO_2**
Electricity (kWh)	42,731	34%	$6,837	1	-54,051	-45.8	-8,648	-2
Natural Gas (m^3)	1,468	76%	$827	3	557	32.3	89	1
Total Energy (ekWh)	**57,927**	**40%**	**$7,664**	**4**	**-48,286**	**-35.5**	**-8,559**	**-1**
Water (m^3)	-	-	-	-	-5	-3.7	-22	0
Total							**-8,581**	**-1**

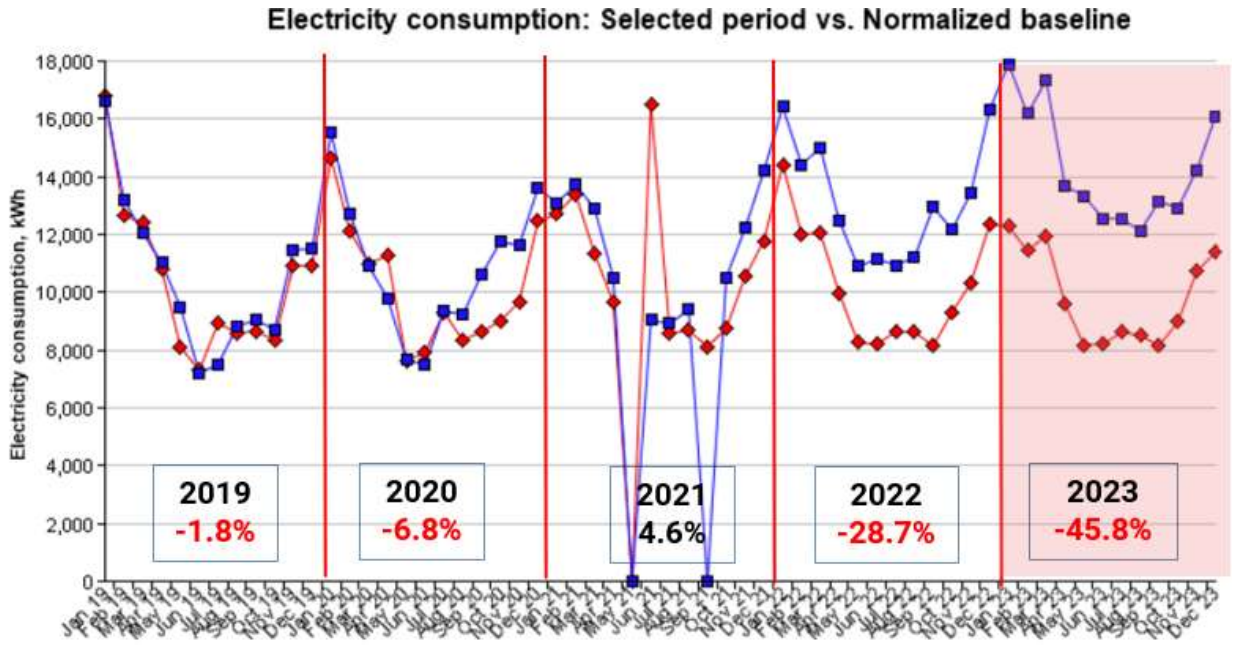

Figure 33 Public Library – Acton Branch Electricity consumption (kWh) in 2019-2023 vs 2018 baseline

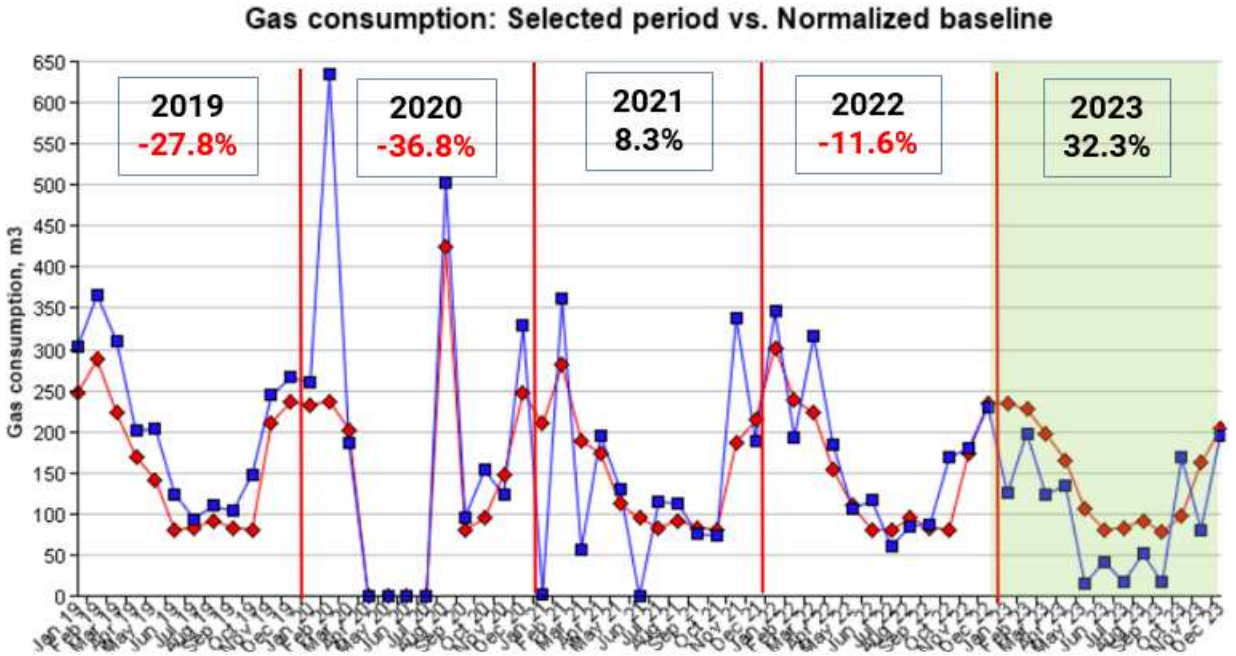

Figure 34 Public Library – Acton Branch Natural gas consumption (m3) in 2019-2023 vs 2018 baseline

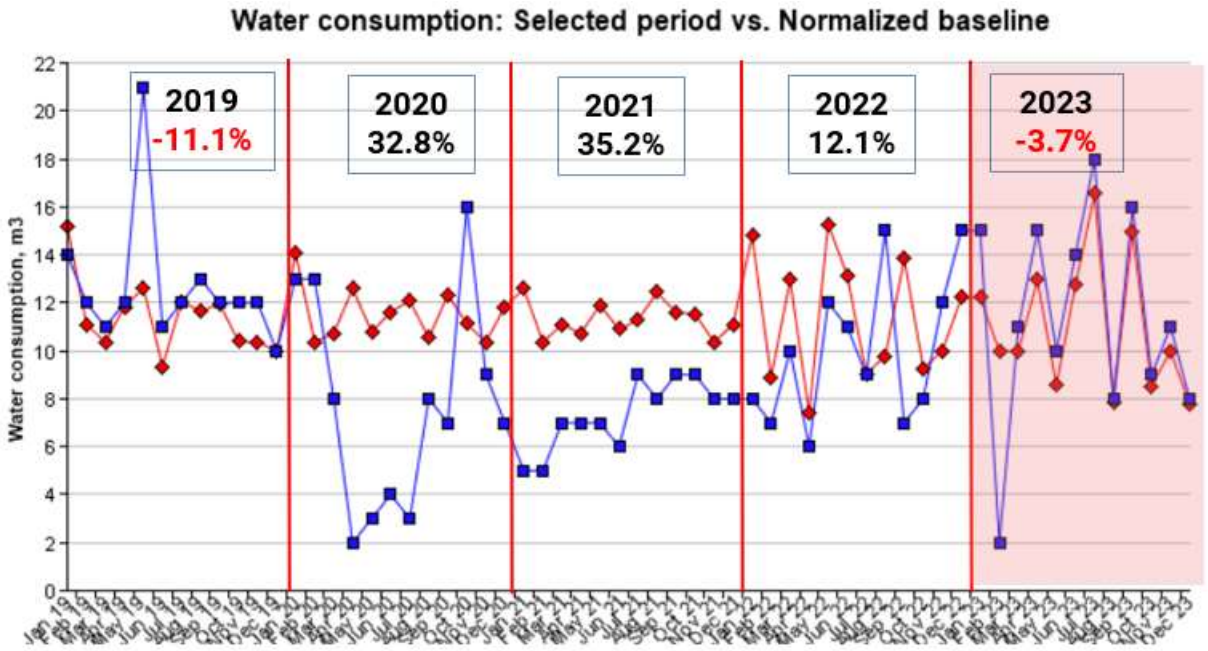

Figure 35 Public Library – Acton Branch Water consumption (m3) in 2019-2023 vs 2018 baseline

Prospect Park Boathouse

Table 24 Prospect Park Boathouse Energy savings vs 2018 baseline

	2019 ECDM target savings				Actual savings 2023 vs 2018 baseline			
	Units	**%**	**$**	**GHG tonnes eCO_2**	**Units**	**%**	**$**	**GHG tonnes eCO_2**
Electricity (kWh)	27,018	76%	$4,593	0.5	-9,936	-31.3%	$-1,590	0
Natural Gas (m^3)	0	0%	$0	0	-96	-4.8%	$-15	0
Total Energy (ekWh)	**27,018**	**44%**	**$4,593**	**0.5**	**-10,930**	**-20.7%**	**$-1,605**	**0**

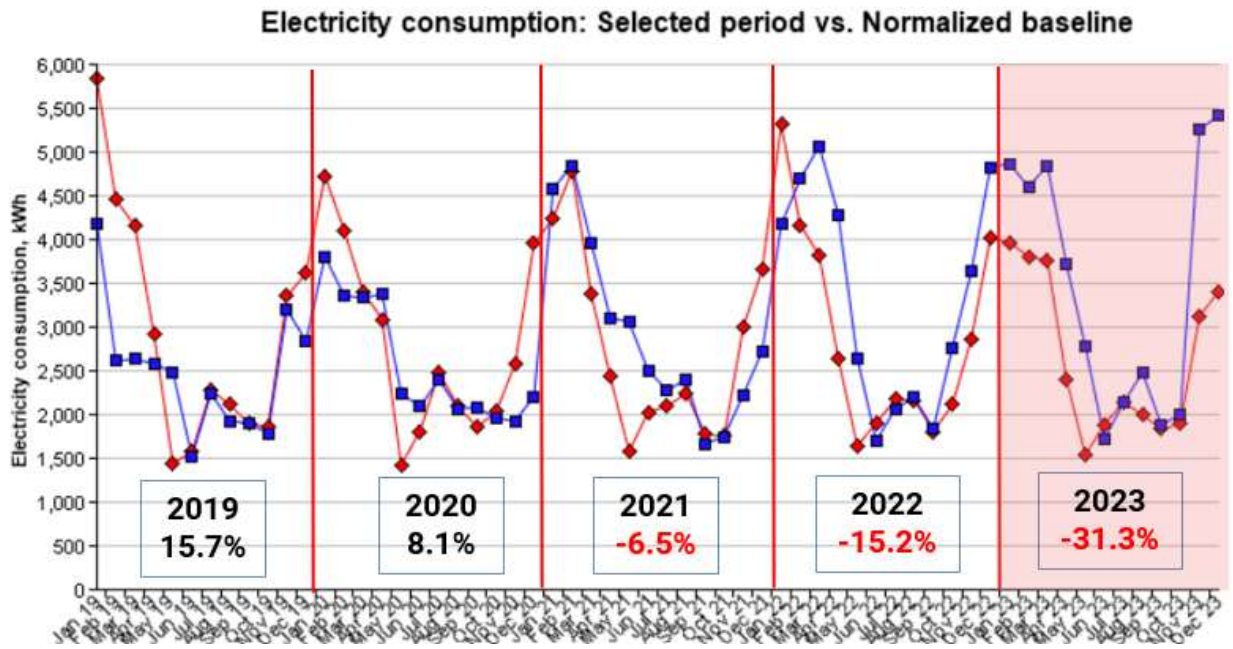

Figure 36 Prospect Park Boathouse Electricity consumption (kWh) in 2019-2023 vs 2018 baseline

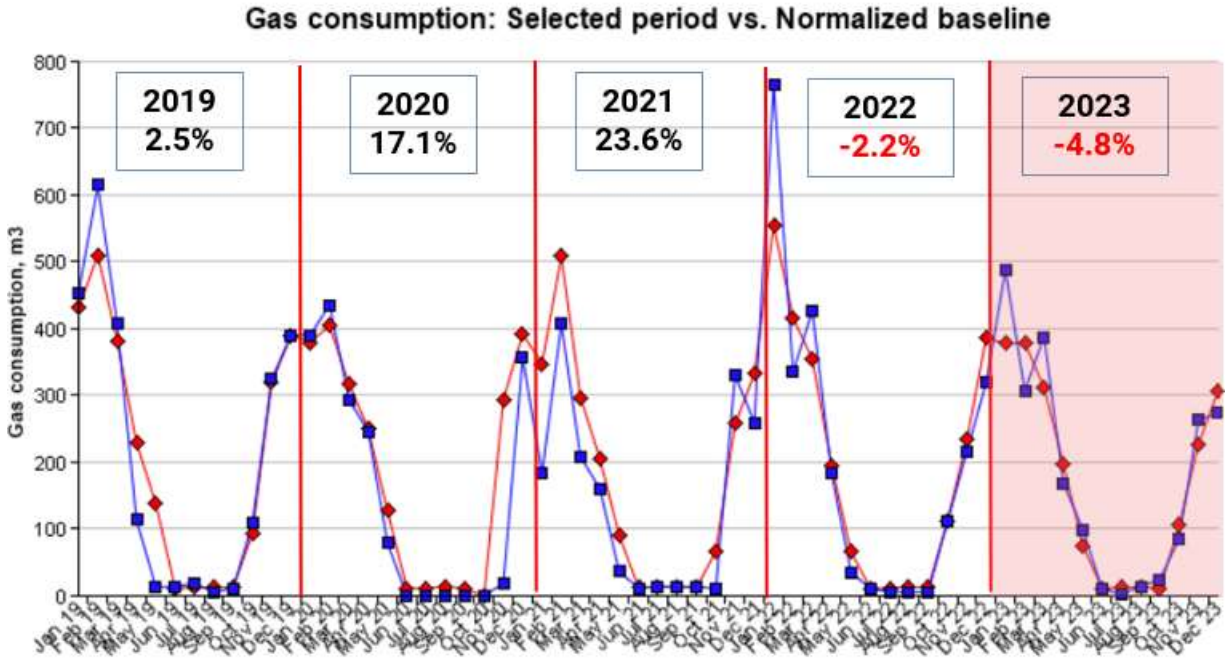

Figure 37 Prospect Park Boathouse Natural gas consumption (m3) in 2019-2023 vs 2018 baseline

Acton Work Yard

Table 25 Acton Work Yard Energy savings vs 2018 baseline

	2019 ECDM target savings				Actual savings 2023 vs 2018 baseline			
	Units	**%**	**$**	**GHG tonnes eCO_2**	**Units**	**%**	**$**	**GHG tonnes eCO_2**
Electricity (kWh)	0	0%	$0	0	-173	-1.1	-27.68	0
Natural Gas (m^3)	6,748	61%	$1,743	13	-155	-1.7	-24.8	0
Total Energy (ekWh)	**69,837**	**53%**	**$1,743**	**13**	**-1,777**	**-2**	**-52.48**	**0**

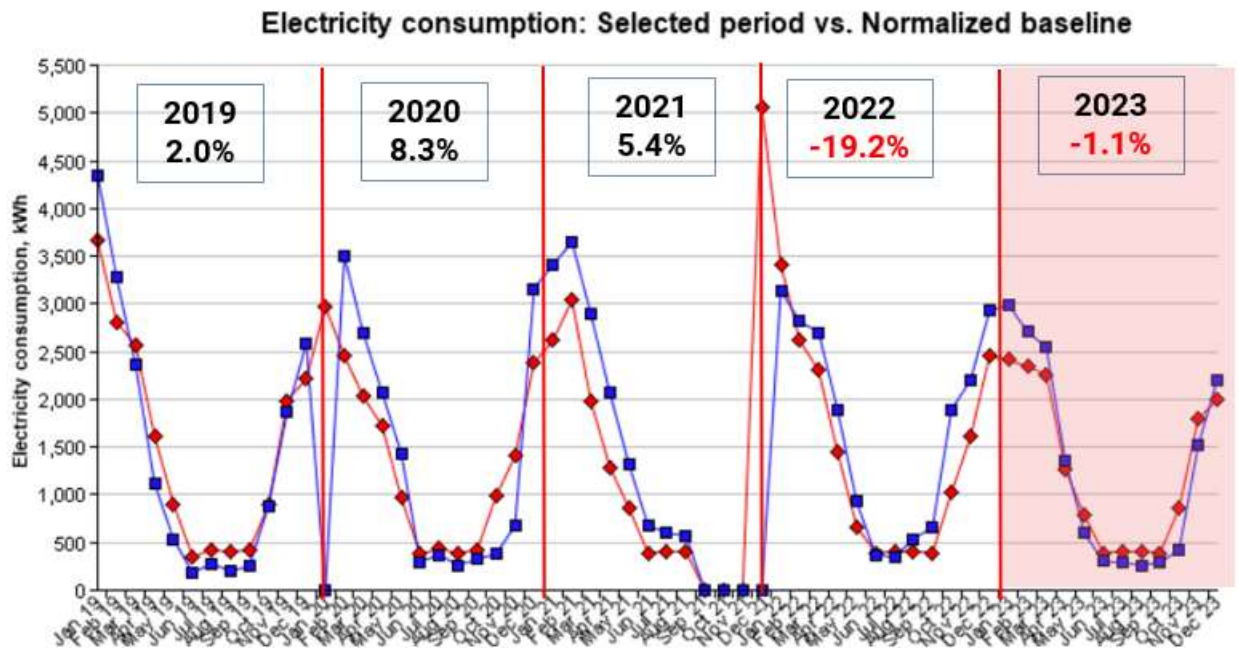

Figure 38 Acton Work Yard Electricity consumption (kWh) in 2019-2023 vs 2018 baseline

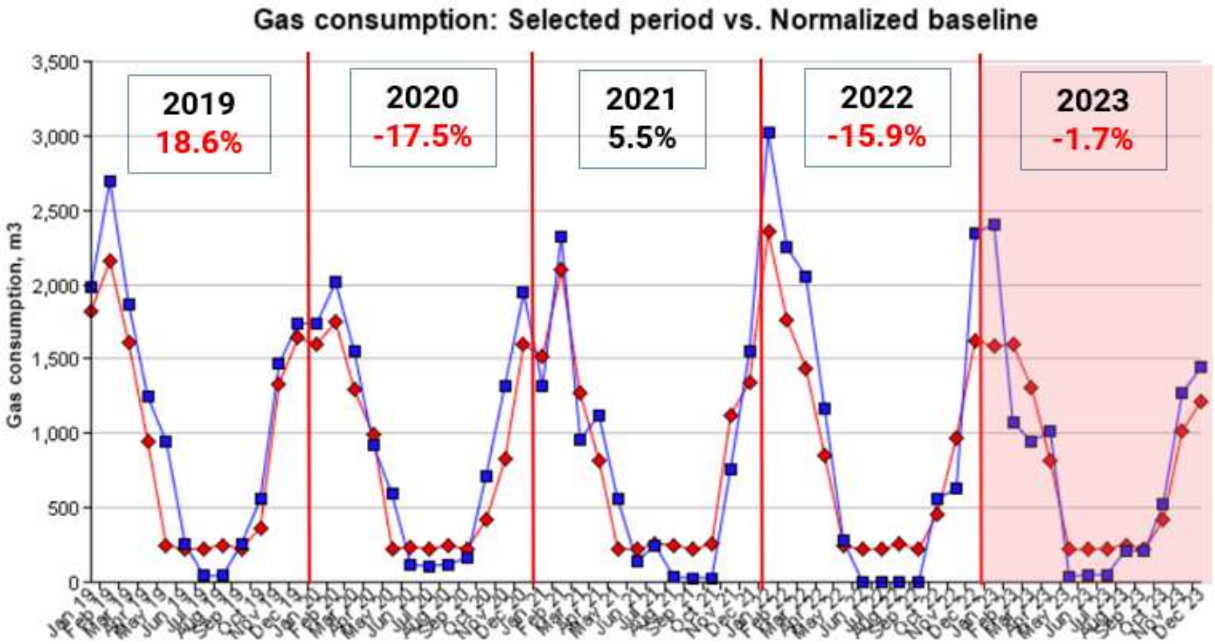

Figure 39 Acton Work Yard Natural gas consumption (m3) in 2019-2023 vs 2018 baseline

Appendix C – Potential energy savings and targets

Through the Mayors' Megawatt Challenge program, energy targets for all Town facilities were established using energy use intensities from the 2019 Broader Public Sector (BPS) database, which consolidates publicly reported data for buildings across Ontario. 2019 is the baseline year because it is most recent period of typical building operations prior to the disruptions caused by the COVID-19 pandemic. These targets are based on the energy performance of the top quartile of buildings within a comparable dataset, meaning that 25% of similar buildings outperform these benchmarks. Based on these targets, the potential energy savings across all Town of Halton Hills facilities amount to 48%.

Table 26 Potential energy savings and targets

Facility	Energy Component	Energy Use Intensity (ekWh/ft^2)		Annual Savings Potential	
		2023 Actual	Target	%	$
Mold-Masters Sportsplex	Base Electricity	18.3	15.3	16%	$62,812
	Electric Cooling	0.0	0.0	0%	$0
	Electric Heating	1.2	0.0	100%	$25,875
	Total Electricity	**19.5**	**15.3**	**22%**	**$88,687**
	Base Thermal	14.0	1.6	88%	$46,837
	Heating Thermal	1.2	1.2	0%	$0
	Total Thermal	**15.2**	**2.9**	**81%**	**$46,837**
	Total Energy	**34.7**	**18.2**	**48%**	**$135,524**
Geller Community Centre	Base Electricity	14.8	14.8	0%	$0
	Electric Cooling	7.4	2.0	74%	$28,894
	Electric Heating	0.0	0.0	0%	$0
	Total Electricity	**22.2**	**16.7**	**25%**	**$28,894**
	Base Thermal	28.4	15.4	46%	$12,375
	Heating Thermal	31.0	16.3	47%	$14,020
	Total Thermal	**59.4**	**31.7**	**47%**	**$26,395**
	Total Energy	**81.5**	**48.5**	**41%**	**$55,289**
Acton Arena & Community Centre	Base Electricity	17.7	14.2	20%	$45,216
	Electric Cooling	0.0	0.0	0%	$0
	Electric Heating	7.3	0.0	100%	$94,347
	Total Electricity	**25.0**	**14.2**	**43%**	**$139,563**
	Base Thermal	11.0	1.6	85%	$21,761
	Heating Thermal	4.0	4.0	0%	$0
	Total Thermal	**15.0**	**5.6**	**63%**	**$21,761**
	Total Energy	**40.0**	**19.8**	**51%**	**$161,324**
	Base Electricity	15.8	9.5	40%	$21,845

Facility	Energy Component	Energy Use Intensity (ekWh/ft^2)		Annual Savings Potential	
		2023 Actual	Target	%	$
Robert Austin Operation Centre	Electric Cooling	0.0	0.0	0%	$0
	Electric Heating	2.9	0.0	100%	$10,120
	Total Electricity	**18.7**	**9.5**	**49%**	**$31,965**
	Base Thermal	0.2	0.2	0%	$0
	Heating Thermal	30.9	6.4	79%	$15,366
	Total Thermal	**31.1**	**6.7**	**79%**	**$15,366**
	Total Energy	**49.8**	**16.2**	**68%**	**$47,331**
Fire Station - District 1	Base Electricity	6.1	5.2	15%	$1,401
	Electric Cooling	0.8	0.8	0%	$0
	Electric Heating	1.7	1.7	0%	$0
	Total Electricity	**8.5**	**7.6**	**11%**	**$1,401**
	Base Thermal	0.9	0.4	49%	$117
	Heating Thermal	15.0	4.0	74%	$3,080
	Total Thermal	**15.8**	**4.4**	**72%**	**$3,197**
	Total Energy	**24.3**	**12.0**	**51%**	**$4,598**
Fire Station - District 2	Base Electricity	16.5	4.9	70%	$25,932
	Electric Cooling	0.0	**0.0**	0%	$0
	Electric Heating	0.0	0.0	0%	$0
	Total Electricity	**16.5**	**4.9**	**70%**	**$25,932**
	Base Thermal	0.6	**0.1**	83%	$207
	Heating Thermal	9.1	**1.0**	89%	$3,249
	Total Thermal	**9.7**	**1.1**	**89%**	**$3,456**
	Total Energy	**26.2**	**6.0**	**77%**	**$29,388**
Acton Works Yard	Base Electricity	1.4	1.1	21%	$99
	Electric Cooling	0.0	0.0	0%	$0
	Electric Heating	5.1	3.6	29%	$499
	Total Electricity	**6.5**	**4.7**	**27%**	**$598**
	Base Thermal	5.9	0.3	95%	$336
	Heating Thermal	36.2	8.7	76%	$1,658
	Total Thermal	**42.1**	**9.0**	**79%**	**$1,994**
	Total Energy	**48.6**	**13.7**	**72%**	**$2,592**
Fire Station - District 3 HQ	Base Electricity	10.0	4.9	52%	$9,875
	Electric Cooling	0.0	**0.0**	0%	$0
	Electric Heating	4.2	2.3	47%	$3,770
	Total Electricity	**14.3**	**7.1**	**50%**	**$13,645**
	Base Thermal	0.3	**0.1**	63%	$62
	Heating Thermal	5.9	**1.0**	83%	$1,676
	Total Thermal	**6.2**	**1.1**	**82%**	**$1,738**

Facility	Energy Component	Energy Use Intensity (ekWh/ft^2)		Annual Savings Potential	
		2023 Actual	Target	%	$
	Total Energy	**20.4**	**8.2**	**60%**	**$15,383**
Halton Hills Public Library and Cultural Centre	Base Electricity	10.0	5.6	44%	$31,088
	Electric Cooling	0.7	0.6	4%	$194
	Electric Heating	2.1	1.6	25%	$3,748
	Total Electricity	**12.8**	**7.8**	**39%**	**$35,030**
	Base Thermal	0.3	0.3	0%	$0
	Heating Thermal	0.1	0.1	0%	$0
	Total Thermal	**0.4**	**0.4**	**0%**	**$0**
	Total Energy	**13.2**	**8.2**	**38%**	**$35,030**
Halton Hills Town Hall	Base Electricity	8.2	**8.2**	0%	$0
	Electric Cooling	1.2	**0.0**	100%	$6,704
	Electric Heating	3.0	0.0	100%	$16,712
	Total Electricity	**12.4**	**8.2**	**34%**	**$23,416**
	Base Thermal	0.7	0.5	23%	$156
	Heating Thermal	6.4	6.4	0%	$0
	Total Thermal	**7.0**	**6.9**	**2%**	**$156**
	Total Energy	**19.4**	**15.1**	**22%**	**$23,572**
Cedarvale CC	Base Electricity	1.8	1.8	0%	$0
	Electric Cooling	0.0	0.0	0%	$0
	Electric Heating	0.0	0.0	0%	$0
	Total Electricity	**1.8**	**1.8**	**0%**	**$0**
	Base Thermal	0.4	0.4	0%	$0
	Heating Thermal	10.8	8.7	19%	$603
	Total Thermal	**11.2**	**9.1**	**19%**	**$603**
	Total Energy	**13.0**	**10.9**	**16%**	**$603**
Public Library - Acton Branch	Base Electricity	20.3	5.6	72%	$18,531
	Electric Cooling	0.0	0.0	0%	$0
	Electric Heating	0.0	0.0	0%	$0
	Total Electricity	**20.3**	**5.6**	**72%**	**$18,531**
	Base Thermal	0.7	0.4	45%	$66
	Heating Thermal	0.6	0.5	20%	$28
	Total Thermal	**1.3**	**0.8**	**33%**	**$94**
	Total Energy	**21.6**	**6.4**	**70%**	**$18,625**
Prospect Park Boathouse	Base Electricity	6.1	5.8	5%	$195
	Electric Cooling	0.0	0.0	0%	$0
	Electric Heating	3.2	0.0	100%	$2,144
	Total Electricity	**9.3**	**5.8**	**37%**	**$2,339**
	Base Thermal	0.7	0.7	0%	$0

Facility	Energy Component	Energy Use Intensity (ekWh/ft^2)		Annual Savings Potential	
		2023 Actual	Target	%	$
	Heating Thermal	4.1	4.1	0%	$0
	Total Thermal	**4.8**	**4.8**	**0%**	**$0**
	Total Energy	**14.1**	**10.6**	**25%**	**$2,339**
			Total Electricity 13 facilities	**34%**	**$410,003**
			Total Thermal 13 facilities	**63%**	**$121,596**
			Total 13 facilities	**48%**	**$531,598**