The City of North Bay

Energy Conservation and Demand Management Plan

June 2025

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Executive Summary

The City of North Bay recognizes that energy conservation and demand management is an integral part of the organization's long-term sustainability as it strives to build a healthy and vibrant community. In 2008, the City established its initial Green Plan. During the life of the plan (2008 to 2012) the City reduced its greenhouse gas (GHG) footprint on the environment from the consumption of fossil fuels by a reduction of approximately 5% from the base year (2007), while adding and expanding assets to the organization.

In 2013, the City of North Bay used its experience working through its initial plan to establish a Conservation and Demand Management Plan that not only meets its regulatory requirements under the Electricity Act (1998), O. Reg. 507/18, but will continue to guide the organization as it embeds environmental awareness into the City's processes and decision-making in order to minimize its carbon footprint on the environment while meeting social and economic responsibilities. During the life of the initial CDM plan (2013-2017) the City reduced its GHG footprint from the consumption of fossil fuels by a reduction of 13.7% from the base year (2012), while adding and expanding assets to the organization. This exceeds the 2.5% per year reduction of GHG goal from the initial plan.

The City of North Bay's Conservation and Demand Management (CDM) Plan establishes a commitment to improve monitoring, tracking, and reporting systems, embeds conservation into departmental planning and budgeting, and identifies energy conservation opportunities throughout the corporation. A central consideration of the City of North Bay's Conservation Management Plan was to ensure it was aligned to the City's Corporate Business Plan's Vision and Mission.

Successful implementation of the CDM Plan will support economic and community development, demonstrate financial responsibility, promote a healthy community, support the organization's goal to foster a culture of continuous improvement and enhance communication to our stakeholders.

The City has demonstrated that it is capable of reducing energy consumption despite pressures that include growth in services, addition of assets, and year-to-year weather variations. The objectives, goals, and targets detailed in the CDM Plan were established recognizing the need to balance competing environmental, economic, and social aims of the community.

Over the life of the CDM Plan the City has targeted to annually reduce its greenhouse gas emissions into the environment by 3% per year. The path to achieving this target is detailed in this Plan.

The Plan articulates the City of North Bay's commitment to reducing its impact on global climate change by making energy and demand management an integral part of the City's operations, planning, and the way it delivers services to the community.

Background

The Conservation and Demand Management Plan is the City's roadmap to reduce its impact on the environment through energy reduction and process improvements to improve the City's long-term sustainability.

In 2008, the City of North Bay developed and implemented a corporate wide Green Plan. The five-year plan established in 2008 used 2007 as its baseline. Targets and objectives were established, and the City reported its progress through an annual report summarizing its performance against the baseline and the previous year. In 2013, the City committed to establishing a new Green Plan that built on the previous Green Plan and would meet the requirements established by the Electricity Act (1998).

The initial City of North Bay Energy and Conservation Demand Management Plan (2013 – 2017) used 2012 as its baseline. The City of North Bay developed an updated CDM Plan which outlined the City's energy management plan for the following 5 years (2018-2022). The City of North Bay's current Energy and Conservation Demand Management Plan will cover 2023 – 2027. The plan continues to use 2007 as its baseline to realize Ontario's commitment to meet the reductions promised in the Paris Accord of a 30% reduction in GHG emissions from 2005-2030 and progress against the plan will be reviewed annually.

The plan will assist the City of North Bay to meet its regulatory requirements under the Energy and Demand Management Regulation under the Electricity Act (1998). The above requirement came into effect on December 12, 2018. Under the new regulation public agencies are required to report annually to the Ministry of Energy their energy use and greenhouse gas emissions, develop and implement energy management plans, and report on results.

CDM Results

The initial Conservation and Demand Management Plan (2013-2017) was the City's roadmap to reduce its impact on global climate change by making energy and demand management as an integral part of the City's operations, planning, and the way it delivers services to the community. The City has demonstrated that it is capable of reducing energy consumption despite pressures that include growth in services, addition of assets, and year-to-year weather variations.

The initial CDM plan sought to reduce electricity from the grid by 2.5% per year, reduce natural gas consumption by 2% per year, reduce the use of traditional fuels by 3% per year, and realize a 2.5% reduction of GHG or 300 tonnes of CO_{2e} gases annually. From the baseline year (2012), the City has met 3 of the 4 targets by reducing the use of traditional fuels by 3.43% per year, reducing electricity from the grid by 2.95% per year, and reducing greenhouse gasses by 2.73% per year. The City did not meet the natural gas target and realized an increase of 3.70% in natural gas consumption per year.

Plan Development

The City of North Bay's Energy Conservation and Demand Management Plan uses a framework established in the development of its original Green Plan. The City utilized its experience from previous years to establish objectives, goals, and targets for the new Energy CDM Plan.

The development of the initial draft was completed by department managers and directors. The draft was presented and discussed by senior managers to ensure it was aligned with the City of North Bay's Strategic Plan. The provided input from leaders and doers of the organization was crucial to the development process.

The plan was developed using the Ontario Provincial Government's Guide to Preparing Conservation and Demand Management Plans.

Key steps in developing the plan are illustrated in the following figure.

Through this process, the City of North Bay's Corporate Mission Statement, Goals, Objectives, and Targets were established. To establish new Goals, Objectives, Mission Statements and ultimately develop a more targeted plan to reduce GHG emissions, the City analyzed the data from previous CDM plans (2013-2017 and 2018-2022).

Mission Statement

North Bay commits to actively and sustainably reduce its impact on global climate change by making energy and demand management an integral part of the City's operations, planning, and service delivery.

Objectives

- Reduce corporate dependency on conventional (GHG intensive) forms of energy (electricity, natural gas, and transportation fossil fuels) through smart management of all assets.
- Use renewable forms of energy where feasible to reduce GHG impacts.
- Support and enhance the City's corporate culture with respect to energy conservation through management leadership and employee engagement.
- Incorporate life-cycle and global climatic impact analysis into business plans and policies.
- Engage and develop community partners.
- Exemplify energy conservation leadership that can be emulated by ABC's and the community at large.
- Communicate progress to all stakeholders.

Goals

- Re-mandate steering and working committees.
- Develop Energy Management Systems to establish a more effective energy measuring, tracking, and monitoring system.
- Establish a Sustainable Buildings Program.
- Integrate Energy Conservation & Demand Management Programs into the Wastewater and Water Distribution as well as Facilities operations and modernization plans.
- Review and update the Green Fleet Plan to continue to improve energy efficiency of the municipal fleet.
- Support energy conservation training and education to expand corporate ability to better address global warming impacts on the corporation.
- Reduce energy related costs.
- Make energy conservation and demand management an element of departmental budget and purchasing processes.
- Meet regulatory requirements.
- Establish a funding plan to help finance energy conservation and demand management projects including expanding renewable energy projects.
- Develop a Communication Plan to spread information to the corporation and to the community.

Targets

- Reduce electricity from the grid by 2.5% per year.
- Reduce the use of traditional transportation fuels by 4% per year.
- Realize a 3% reduction of GHG or 429 tonnes of CO2e gases annually.

An expanded discussion of the City of North Bay's Objectives and Goals is presented in Appendix 1.

Baseline Year

The City of North Bay's Green Plan (2008-2012) used 2007 as its baseline. The initial CDM Plan (2013-2017) used 2012 as its baseline for comparison due to the availability of data and a re-confirmation of the commitment to reduce energy. The 2018-2022 CDM Plan established 2007 as its baseline for comparison due to availability of data and Ontario's commitment to meet the reductions promised in the Paris Accord of a 30% reduction in GHG emissions from 2005-2030.

The new CDM Plan (2023 – 2027) has also established 2007 as its baseline for comparison. The baseline year will be used for analysis and measurement of progress for future energy and emission reduction calculations.

Table 1 below is a high-level summary of 2024 versus the baseline year. Detailed annual consumption data is summarized in Appendix 2.

Table 1: City of North Bay 2024 versus 2007 Energy Use – All Sectors

2007 Baseline	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Total
Total Quantity Used	23,093,067	1,359,460	1,489,778	
Total GHG Produced (Tonnes of CO_{2e})	16,327	2,630	15,166	34,122

2024	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Total
Total Quantity Used	19,624,841	799,836	1,639,799	
Total GHG Produced (Tonnes of CO_{2e})	13,875	1,547	16,693	32, 115

2007 vs 2024	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Total
Reduction Quantity	Reduced by 3,468,226	Reduced by 559,624	Increased by 150,021	
GHG Reduction (Tonnes CO_{2e})	Reduced by 2,452	Reduced by 1,082	Increased by 1,527	Reduced by 2,007
Percent GHG Reduction (30% Goal)	Reduced by 15.02 %	Reduced by 41.17 %	Increased by 10.07 %	Reduced by 5.88 %

Greenhouse Gas Emissions

Another important metric that the City will measure to monitor its progress is the reduction of greenhouse gas emissions to the environment. The City has established a target of reducing its greenhouse gas emissions by 3% per year or the approximate equivalent of 429 tonnes of CO_{2e} gases to the environment.

A summary of its performance from 2024 relative to the 2007 baseline is presented in Appendix 4.

Table 2 below summarizes the greenhouse gases generated in 2024 by the City of North Bay.

Table 2: City of North Bay 2023 versus 2024 Energy Use – All Sectors

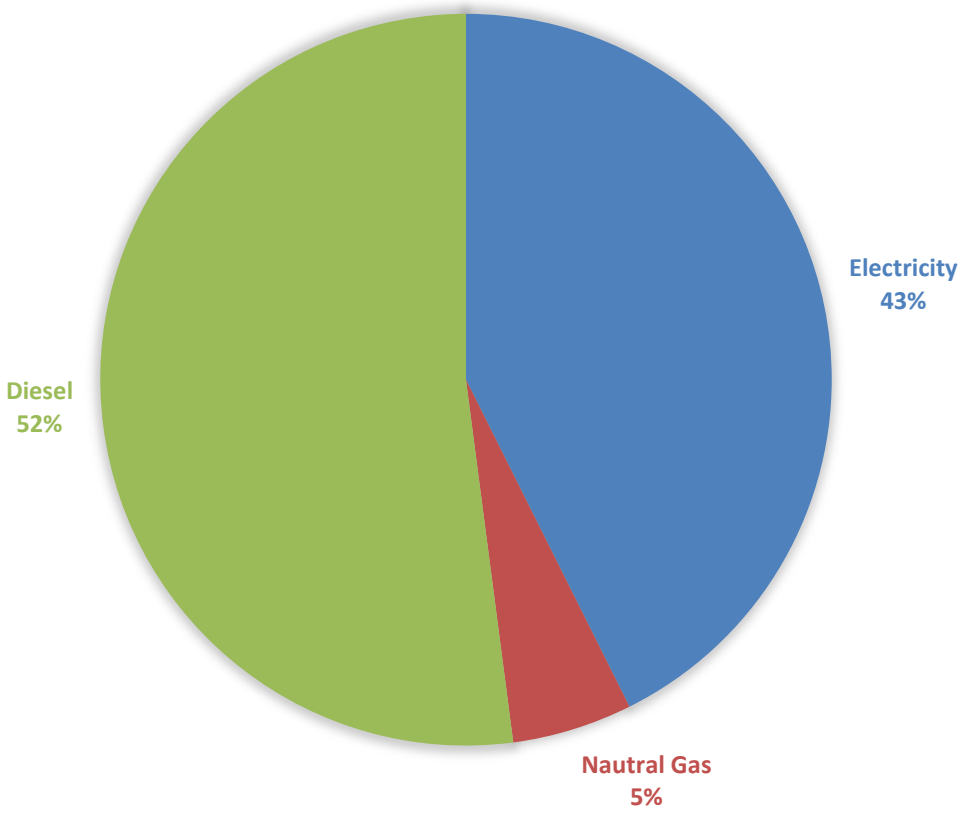
2024	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Total
Total Quantity Used	19,624,841	799,836	1,639,799	
Total GHG Produced (Tonnes of CO_{2e})	13,875	1,547	16,693	32, 115

2023	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Total
Total Quantity Used	19,303,120	879,321	1,638,134	
Total GHG Produced (Tonnes CO_{2e})	13,647	1,701	16,676	32,024

2023 vs 2024	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Total
Reduction Quantity	Increased by 321,721	Reduced by 79,485	Increased by 1,665	
GHG Reduction (Tonnes CO_{2e})	Increased by 228	Reduced by 154	Increased by 17	Increased by 91
Percent GHG Reduction	Increased by 1.67 %	Reduced by 9.04 %	Increased by 0.10%	Increased by 0.28 %

Figure 1 provides a summary of energy used and overall greenhouse gas emissions for the City of North Bay in 2024. Electricity and Transportation Fuel comprise the majority of emissions. In 2024, the City of North Bay produced 32,115 tonnes of CO_{2e}, a decrease of 2,007 tonnes compared to 2007.

Figure 1: 2024 GHG Emissions Summary



North Bay's Energy Projects

Since 2007, the City of North Bay has investigated, developed, and implemented many energy efficiency projects.

A summary of major initiated, completed, and future energy related projects is presented in Appendix 5.

Listed below is a sampling of some of the projects/programs.

Completed Energy Projects

- Replacement of HPS street lights with LED fixtures
- Converting traffic lights to LED's
- Evaluating and replacing decorative lights
- Lighting and heating upgrades at City/YMCA Aquatics Center
- Utilization of landfill gas for the production of electricity
- Evaluation of Cogeneration Project at Wastewater Treatment Plant
- Installation of residential water meters
- Reduction of the City's fleet size
- Elimination of Janey Avenue pumping station
- Education and Awareness Training Pilot with LAS/AMO
- Upgrading bus barn overhead doors to improve building envelope performance
- Purchasing of fully electric Zamboni
- Sewage Treatment Plant digester gas utilization
- On-demand bus system
- Water meter installation and water conservation
- Community Energy Park
- Demand Response Initiatives
- Interval metering
- Parking lot lighting review
- Investigating a new low energy filter technology for the Aquatics Centre
- Outdoor area lighting review (Lot 8 and City Hall Grounds)
- Quantitative energy audit of the City Hall building envelope
- Renewing the Pete Palangio Ice Plant chiller
- Improved use of Building Automation Systems
- Landfill Gas Well System Expansion
- Traffic study complete and time of day signal plans were enhanced. Installed low prior pre-emption systems in Transit buses which operates through the GTT emergency vehicle pre-emption system.
- 64 windows were replaced with energy efficient windows at City Hall.
- Hybrid replacements to date include 5 hybrid SUV's, 2 hybrid trucks, 1 electric Zamboni, and 3 hybrid transit buses.

Current Projects

- Improve traffic flows/automate signalization systems.
- High efficiency pumps at the Wastewater Treatment Plant
- Emission Reduction in Fleet – Implementation of hybrid and electric vehicles (buses, SUV's) as well as reducing gas powered tools by replacing with battery powered tools.
- Side street detection and pedestrian push buttons are being installed at intersections that are not running a coordinated pattern.
- Reduced Idling – monitoring to avoid excessive idling. Selected vehicles have automatic shut offs which stops needless idling, wear on engines, and reduces fuel consumption and emissions.
- Building envelope upgrades at Pete Palangio.
- Replacement of select vehicles with hybrid/electric alternatives.

Future Energy Projects

Going forward, the City has identified several potential projects. These include:

- Waste Water Treatment Plant blower upgrades
- Memorial Gardens ice plant condenser upgrade

Renewables

Solar Initiatives

In 2008, the City commissioned a 60 panel (10-kilowatt) solar photovoltaic array on the roof of City Hall (Figure 2). In 2024, 5655.1 kWh of solar power energy was produced, resulting in $4,535 in revenue. Since commissioning to the end of 2024, the system generated 100,800 kWh of electricity. The electricity was originally sold to the Ontario Power Authority under the Renewable Standard Offer Program (RSOP) for 42¢ per kilowatt hour. Beginning in November 2010 the City was approved to transfer the RSOP to the OPA's microFIT program and received 80.2¢ per kWh for all power produced until May 2028.

Figure 2: 10 kWh solar panels on the roof of City Hall. **Figure 3:** Solar Hot Water on roof of new Water Plant

In 2010 the City commissioned its new Water Filtration Plant which uses a solar hot water system on its roof (shown in Figure 3) to heat water used for filter cleaning.

Landfill Gas to Electricity

The City partnered with North Bay Hydro Services to install a power generation facility that utilizes landfill gas produced at the Merrick Landfill Site. The station was commercialized in June 2012. Prior to providing landfill gas to the power generation facility the City operated a landfill gas flaring station. In 2013, the landfill collected and supplied 7,829,552 m^3 of landfill gas (LFG). Utilization of the LFG for electricity generation reduced greenhouse gas emissions by 58,829 tonnes. Without the flare and generator, Merrick would have produced approximately 2.5 times more greenhouse gas emissions than all the energy used by the City in its operations. In its first full year of operation the project generated $391,984 in LFG sales for the City. At its peak, the Merrick Project will generate enough electricity to satisfy the electrical power needs of approximately 1200 homes per year. In 2024, the landfill gas to electricity operation produced a total of 1,810,256.78 kWh. Each kWh is sold with a unit price of 3.8 cents. This generated a total income of $68,789.76. It has produced a total income of $2,220,148.93 since its commissioning.

Figure 4: Landfill Gas Utilization to Electricity Facility and Landfill Gas Flaring Station located at the City's Merrick Landfill Site

Table 3 presents a summary of the LFG to electricity project in terms of finances and energy produced.

Table 3: Merrick Landfill Gas to Electricity Project

Total Costs	$4,000,000
Start Date	May 2010
Construction Start Date	July 2011
Completion Date	June 12, 2013
Electricity Generated (2024 average/month)	150,855 kWh
Projected Annualized Revenue	$1.05 to 1.15 Million
Projected Annual Revenue to the City	$350,000 to $450,000
Expected Payback	10 Years

Sewage Treatment Plant Energy Audit

In 2022 the City employed the services of engineering consultant RV Anderson to complete an audit for the energy use at the Sewage Treatment Plant. The report will include recommendations for improvements to the treatment process which would enhance effluent quality and/or reduce energy consumption. It will also include suggestions for potential energy reducing strategies and/or energy production, such as, for example, hydropower from wastewater outfall. As of June 2025, the project is in draft form.

Education, Training, and Awareness

Education, training and awareness is an integral part of the project plan and is critical to the success of the projects in terms of achieving and sustaining proposed savings. They are also essential in creating, maintaining and improving a sustainable energy culture within the Corporation of the City of North Bay and throughout the community. The overall intent of the training program is to complement the technological and organizational changes proposed in the plan and maximize the energy savings resulting from projects. The City of North Bay has made numerous efforts to ensure resources and operations are assisting in meeting the goals of the CDM plan to the best of the operation's current abilities while factoring in variances shown by isometric data, feasibility studies, and concerns.

Training on building systems and energy efficiency will allow the building staff to modify operations to increase efficiencies, identify opportunities for energy savings measures and raise awareness of energy efficiency among all staff.

In 2014, the City undertook a partnership with LAS to complete an Energy Conservation Education and Awareness Training initiative. The purpose of this workshop was to help inspire the change of typical workplace behaviours from energy consuming to energy conserving. To do this, the workshop promoted the understanding of energy consumption as well as to offer many workplace energy conservation tips. The training also included helpful tips that participants can utilize to reduce their energy consumption in their homes.

In an office environment it is recognized that lighting can account for up to 40% of energy costs, space heating and cooling can account for between 20-40% and plug loads for 5-10%. Thus, training sessions included ways to save costs through conservation by exploring means to reduce lighting consumption, heating and cooling demand, and plug loads. In addition, the training sessions will provide a vehicle to communicate past and present progress on energy conservation and demand management and introduce future conservation and demand management plans.

Recognizing beneficial advances that have been previously made towards achieving the City's goals is an important step in sustainability. These advances are continuing to be made to further increase the value and impact of these initiatives. Raising awareness through controllable environmental initiatives is implemented corporately, impacting all City assets. Staff have been given several tools to increase their own energy efficiency.

The City of North Bay website is a great resource for both staff and the public to become informed and learn more about environmental services and renewability. The website provides information on composting, recycling, pesticide use and water conservation and can be found at the following address:https://www.northbay.ca/our-community/environment-sustainability/

Action Items, Responsibilities and Timelines

Appendix 1 expands the City of North Bay's Objectives and Goals previously presented. It also provides for responsibilities and timelines.

Appendix 1: City of North Bay's Expanded Objectives and Goals

1. **Re-Mandate steering committee and working committee.**

    a. Steering committee meets quarterly to review corporate and departmental progress, exchange CDM information, learn about new opportunities etc.

Timing: Ongoing.

2. **Update Energy Data Management System to establish a more effective Monitoring and Tracking System that includes:**

    a. Efficient Data Collection
    b. User Friendly Interface for major asset groups
    c. Quarterly and Annual Reports
    d. Identify, investigate, and implement where viable sub-metering capabilities

Timing: Ongoing

3. **Establish a Sustainable Buildings Program**

    a. Develop a Sustainable Building Policy.
    b. Complete 2 Building Energy Studies targeted on major energy consumers with potential for significant improvement over the next 5 years.
    c. Integrate Sustainable Building Best Practices into all new building construction and retrofit projects.
    d. Improve utilization of BAS where available
    e. Investigate feasibility of a corporate wide open protocol BAS
    f. Identify peak demand for development of peak demand management strategies
    g. Include major departments and ABC's
    h. Improve energy efficiency for new and existing residential and commercial buildings in the community.

Timing: Establish a corporate subcommittee mandated to establishing a Sustainable Buildings Program in 2023-2027.

4. **Wastewater and Water Distribution and Facilities**

    a. Integrate CDM into operations and modernization plans.

Timing: Driven by the Senior Facilities and Environment Engineer, Director of Public Works, Manager Water/Wastewater, and Manager Distribution/Collection the CDM plan will be integrated in current operations planning modernization plans. Plan development is targeted for 2023-2027.

5. **Establish key partners and relationship.**

    a. To identify and develop viable projects
    b. To fill technical and resource gaps where applicable
    c. To effectively utilize all available funding avenues to finance best in class projects that meet the corporation's goals.

Timing: Ongoing.

6. **Improve the energy efficiency of the municipal fleet.**

    a. Establish goals to be achieved by 2027
    b. Establish plan for switching to more efficient vehicles during the normal replacement cycle
    c. Investigate and evaluate potential of alternative fuels

Timing: Ongoing.

7. **Update Green Fleet Plan**

    a. Identify new potential projects
    b. Audit operating practices

    Timing: Ongoing.

8. **Establish a funding plan to help finance energy conservation and demand management projects including expanding renewable Fts.**

    a. Utilize multiple funding options.
    b. Wherever possible funding for projects should include all available sources including other government incentives, utility and/or equipment incentives etc.
    c. Develop policy and guidelines for the CDM Project Fund.

Timing: 2023 - 2027.

9. **Facilitate communication to the corporation and to the community**

    a. Communication of performance
    b. Continue to enhance energy conservation culture
    c. Communication to Developers/Builders for new construction

Timing: Items (a) and (b) are ongoing. Develop a communication plan to communicate results to other local groups.

10. **Incorporate energy conservation into project management**

    a. Examine life cycle cost vs up front cost when planning

Timing: Ongoing

11. **Education, Awareness and Training**

    a. Identify potential Energy Conservation Education and Awareness Training.

    b. Complete workshops for designated staff.

Timing: 2023 - 2027

12. **Meet all provincial regulatory requirements.**

    a. The Electricity Act

Timing: Ongoing.

Appendix 2: City of North Bay Detailed Energy Consumption Data

2.1 Electricity

Table 5: The City of North Bay's Electricity Annual Consumption Data 2007-2024

Facility	Baseline 2007 kW-hrs	2023 kW-hrs	2024 kW-hrs	Variation 2007 vs. 2024 kW-hrs	Variation 2023 vs. 2024 kW-hrs
Trout Lake WTP	4,944,149	4,270,475	4,310,912	-633,237	40,437
Sewage Plant	3,499,040	2,847,262	2,754,891	-744,149	-92,371
Street Lights	3,306,186	2,036,369	2,042,502	-1,263,684	6,133
Pete Palangio Arena	1,610,640	1,037,835	1,091,961	-518,679	54,126
City Hall	1,624,320	1,567,944	1,499,558	-124,762	-68,386
Public Works	1,421,790	602,696	598,964	-822,826	-3,732
Memorial Gardens Arena	1,231,920	1,739,300	1,917,231	685,311	177,931
Reservoirs/ Water PS	1,087,204	670,059	674,179	-413,025	4,120
Aquatic Centre	933,840	733,193	879,879	-53,961	146,686

Facility	Baseline 2007 kW-hrs	2023 kW-hrs	2024 kW-hrs	Variation 2007 vs. 2024 kW-hrs	Variation 2023 vs. 2024 kW-hrs
Parks/Beaches	825,000*	825,000	825,000	0	0
Sewage Lift/ Pump Stations	495,138	475,081	494,402	-736	19,321
West Ferris Arena	590,600	380,994	360,121	-230,479	-20,873
Fire Stations	287,281	315,548	303,010	15,729	-12,538
Other Parking Lots	195,000*	195,000	195,000	0	0
Parking Garage	151,412	63,002	62,302	-89,110	-699
Traffic Lights	269,138	153,747	165,320	-103,818	11,573
Merrick Landfill	126,532	669,186	678,827	552,295	9,640
Marina	135,828	97,451	109,518	-27,310	12,067
Lee Park	125,200	78,494	90,960	-34,240	12,466
Marsh Landfill	86,850	165,193	163,714	76,864	-1,478

Facility	Baseline 2007 kW-hrs	2023 kW-hrs	2024 kW-hrs	Variation 2007 vs. 2024 kW-hrs	Variation 2023 vs. 2024 kW-hrs
Other Waterfront	75,000*	75,000	75,000	0	0
Transit/Shelters	70,000	77,970	81,750	11,750	3,780
Public Library	NO DATA	226,320	249,840	NO DATA	23,520
Annual Total	**23,093,067**	**19,303,120**	**19,624,841**	**-3,468,227**	**321,721**

Note: Numbers with an asterisk (*) are estimate.

Figure 5 presents annual electricity consumption of the top 10 users of the City from 2007 to 2024. These locations plus the Public Library consume most of the City's electricity and this is where the majority of energy efficiency recommendations are focused.

Figure 5: Electricity Consumption by Facility (2008-2024)

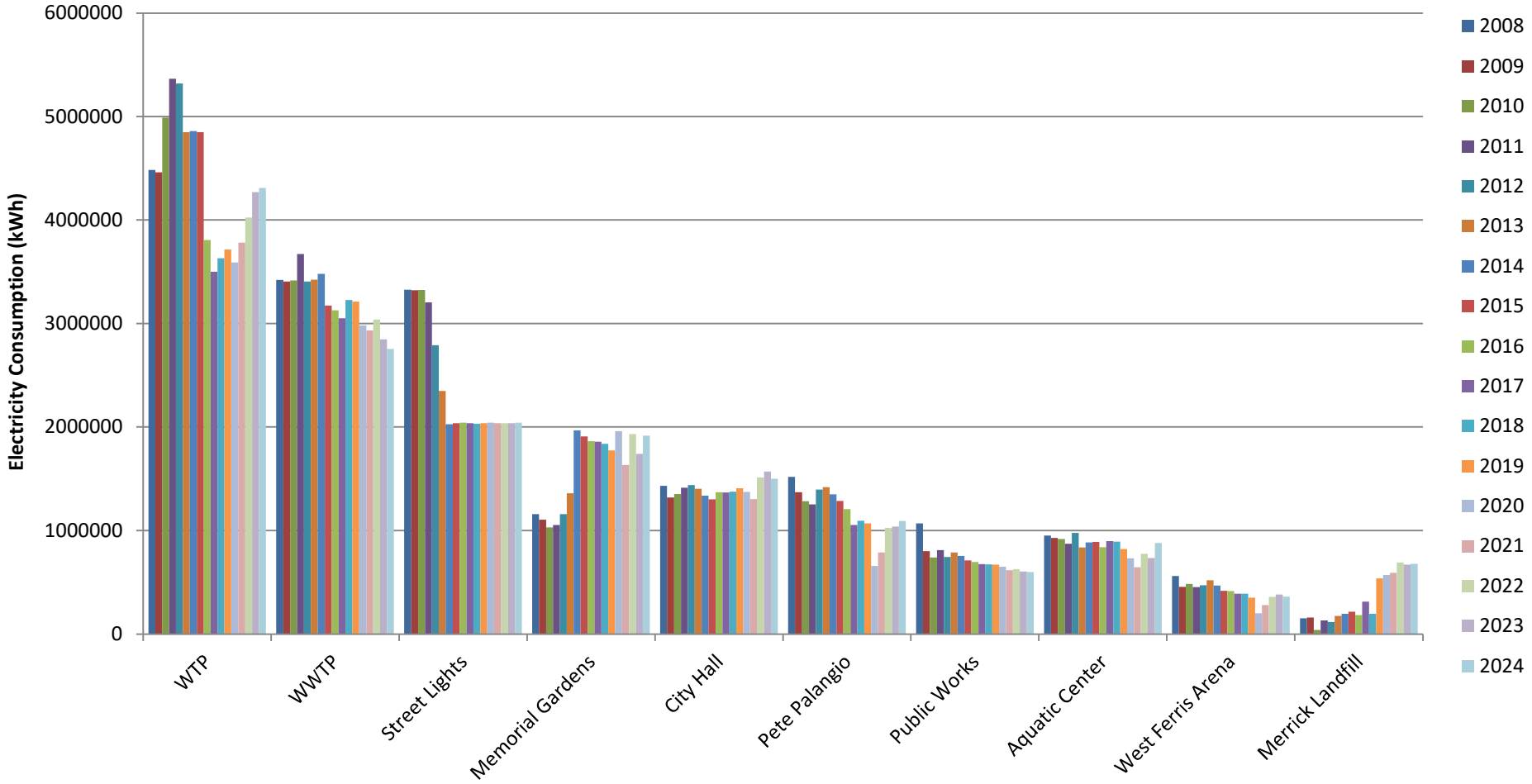
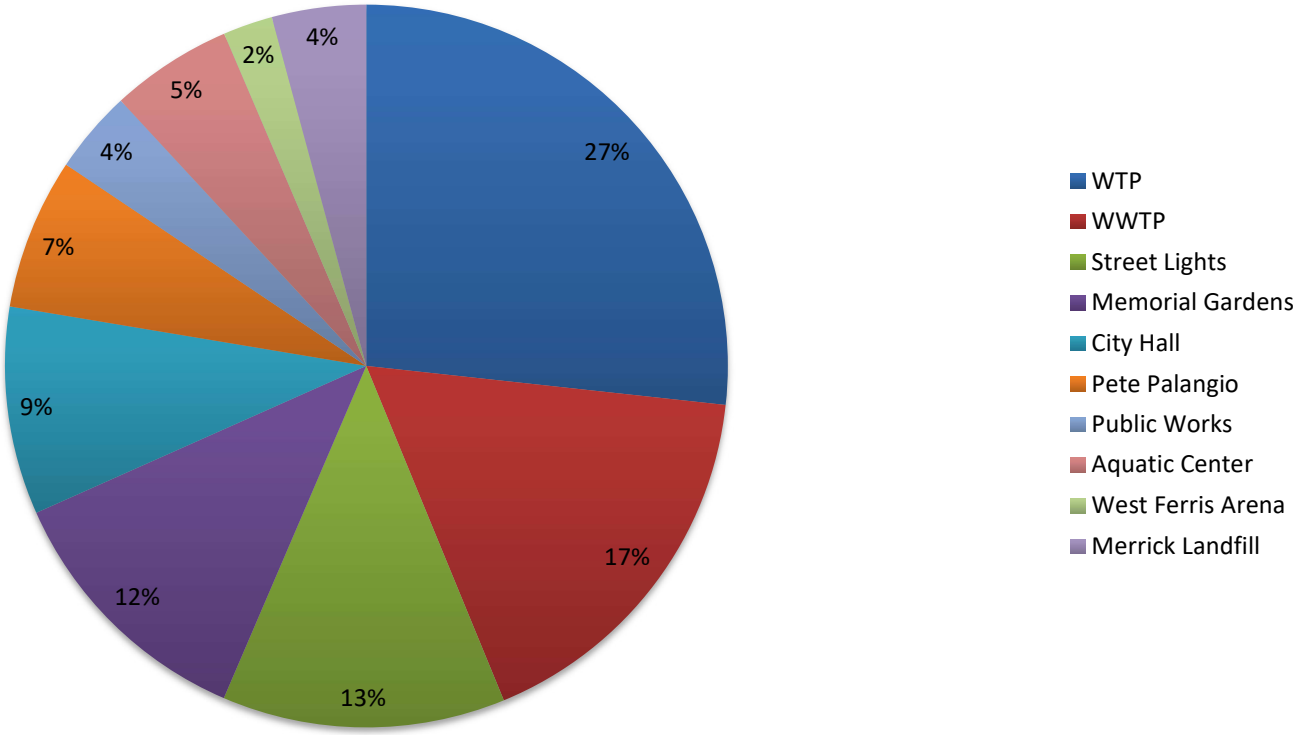


Figure 6 presents the electricity used by facility by the percentage of total used in 2024 by the City of North Bay. The top 10 users are identified.

Figure 6: Breakdown by Facility of 2024 Electricity Consumption



2.2 Natural Gas

Table 6: The City of North Bay's Natural Gas Annual Consumption Data 2007-2024

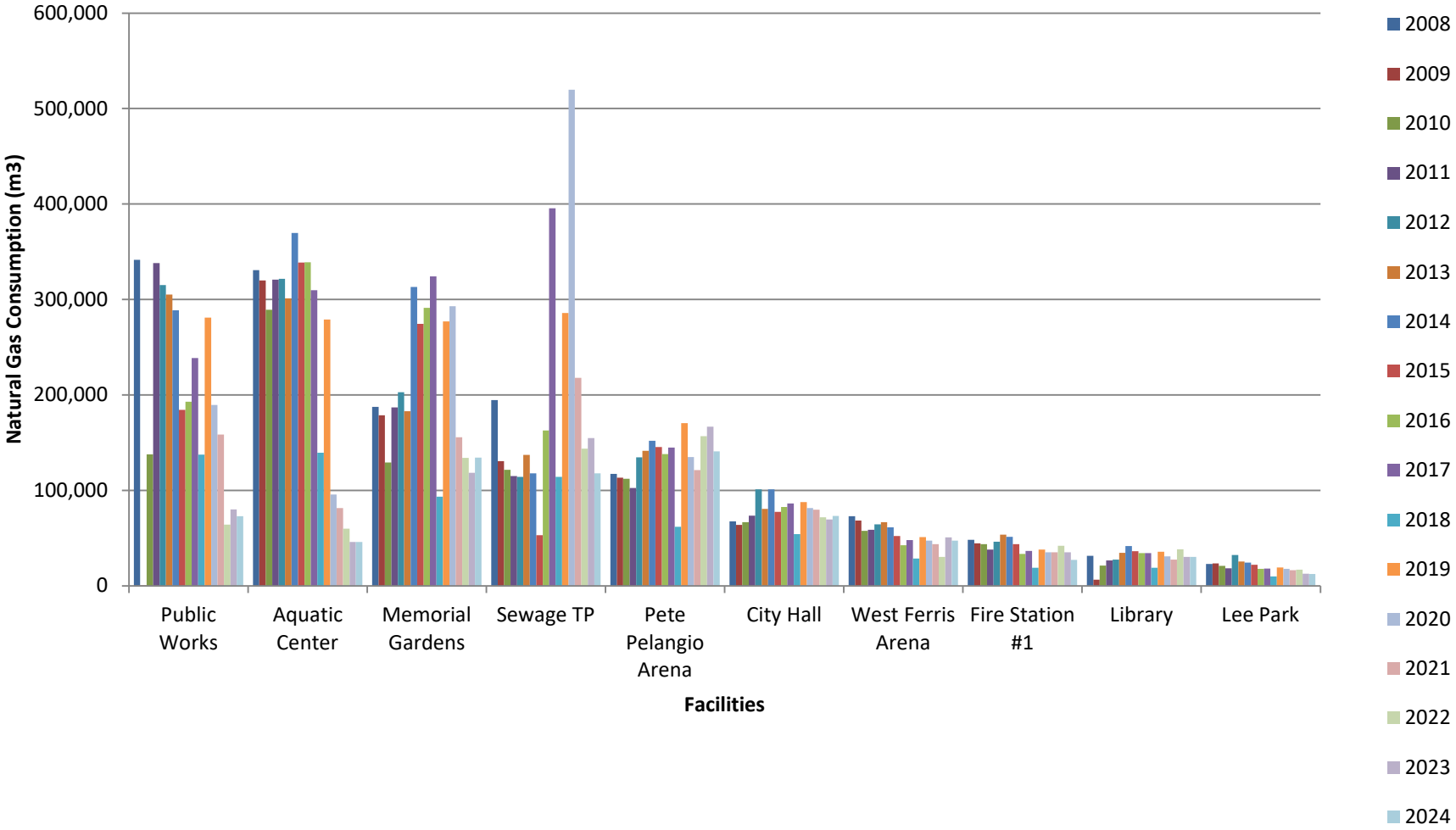
Facility	Baseline 2007 m3	2023 m3	2024 m3	Variation 2007 vs 2024 m3	Variation 2023 vs 2024 m3
Public Works	299,538	80,068	72,764	-226,774	-7,304
Aquatic Center	320,024	45,968	45,876	-274,148	-92
Memorial Gardens Arena	186,361	118,244	134,184	-52,177	15,940
Sewage Treatment Plant	161497	154,780	117,666	-43,831	-37,114
Pete Palangio Arena	102,424	166,558	140,901	38,477	-25,657
West Ferris Arena	64,681	50,697	47,165	-17,516	-3,532
City Hall	54,996	69,381	73,108	18,112	3,727
Fire Station 1	49,740	35,086	27,192	-22,548	-7,894
Lee Park	22,441	12,503	12,223	-10,218	-280

Facility	Baseline 2007 m3	2023 m3	2024 m3	Variation 2007 vs 2024 m3	Variation 2023 vs 2024 m3
Fire Station 2	18,117	11,768	10,197	-7,920	-1,571
Fire Station 3	15,270	11,421	10,479	-4,791	-942
New Bus Terminal	12,993	15,589	13,163	170	-2,426
Water Treatment Plant	11,966	39,940	35,438	23,472	-4,502
Fire Station 4	12590	4,904	5,198	-7,392	294
Kinnette Playground	5,713	6,085	5,534	-179	-551
Marathon Beach	-	533	135	135	-398
Laurentian Playground	1256	1,615	1,379	123	-236
330 Main East	0	10,154	8,797	8,797	-1,357
1105 Lakeshore Drive	0	10,891	8,294	8,294	-2,597
Library	-	30,274	30,143	30,143	-131

Facility	Baseline 2007 m3	2023 m3	2024 m3	Variation 2007 vs 2024 m3	Variation 2023 vs 2024 m3
Annual Total	1,359,460	879,321	799,836	-559,624	-79,485

Figure 7 presents the annual Natural Gas consumption of the top 10 users of the City since 2007.

Figure 7: Natural Gas Consumption by Facility (2007-2024)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500,000
400,000
300,000
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Natural Gas Consumption (m3)
Public Works
Aquatic Center
Memorial Gardens
Sewage TP
Pete Pelangio Arena
City Hall
West Ferris Arena
Fire Station #1
Library
Lee Park
Facilities
2008
2009
2010
2011
2012
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2014
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2016
2017
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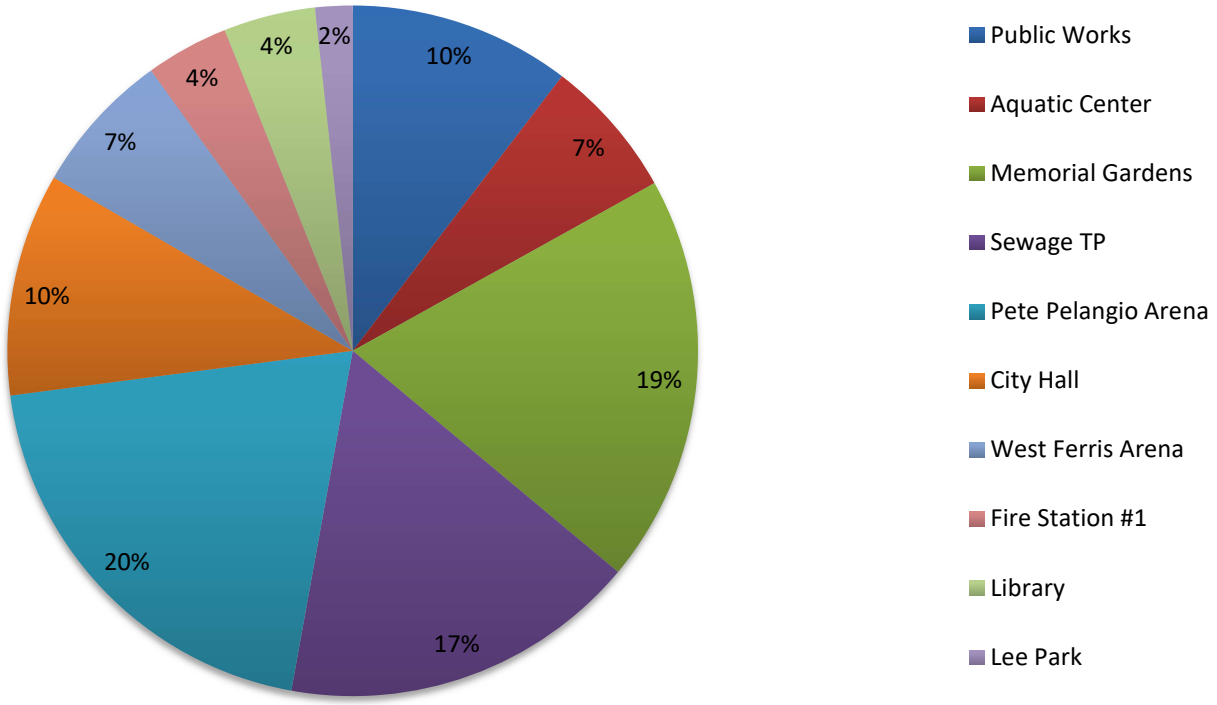
2022
2023
2024

Figure 8 illustrates natural gas consumed by facility by the percentage of total used in 2024 by the City of North Bay. The top 10 users are identified.

Figure 8: Breakdown by Facility of 2024 Natural Gas Consumption



2.3 Transportation Fuel

Table 7: Annual Transportation Fuel Consumption Data

Function	2007 (L)	2022 (L)	2023 (L)	2024 (L)
Fleet/Garage	NO DATA	9,563	15,884	15,372
Police	NO DATA	108,605	113,586	126,117
Parks	70,174	69,478	79,045	74,107
Transit	868,826	500,133	584,372	632,385
Ambulance	NO DATA	119,500	98,672	102,532
Public Works	501,824	486,369	497,244	442,418
Hydro	NO DATA	95,916	94,104	86,682
Water/Wastewater Plant	NO DATA	9,441	9,302	10,694
By-law, Parking, Survey	2,447	15,000	15,934	15,507
Fire	46,507	36,967	40,464	40,297
Landfill	-	78,875	88,890	92,670
Arena	NO DATA	708	940	1,017
Annual Total	**1,489,778**	**1,530,554**	**1,638,436**	**1,639,799**

Figure 9 presents the annual transportation fuel consumption by department in the City of North Bay since 2007.

Figure 9: Transportation Fuel Consumption by Function (2007-2024)

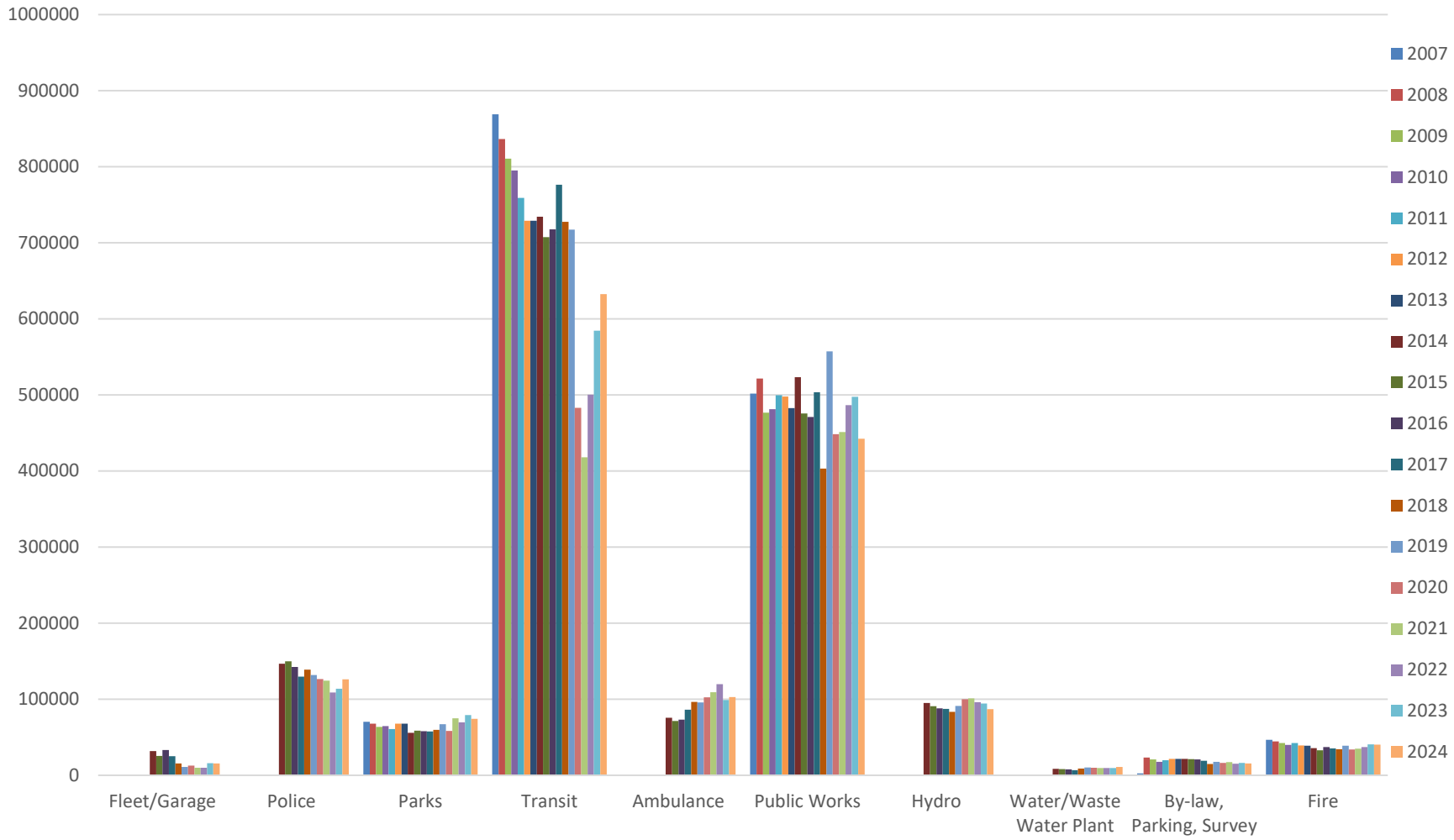
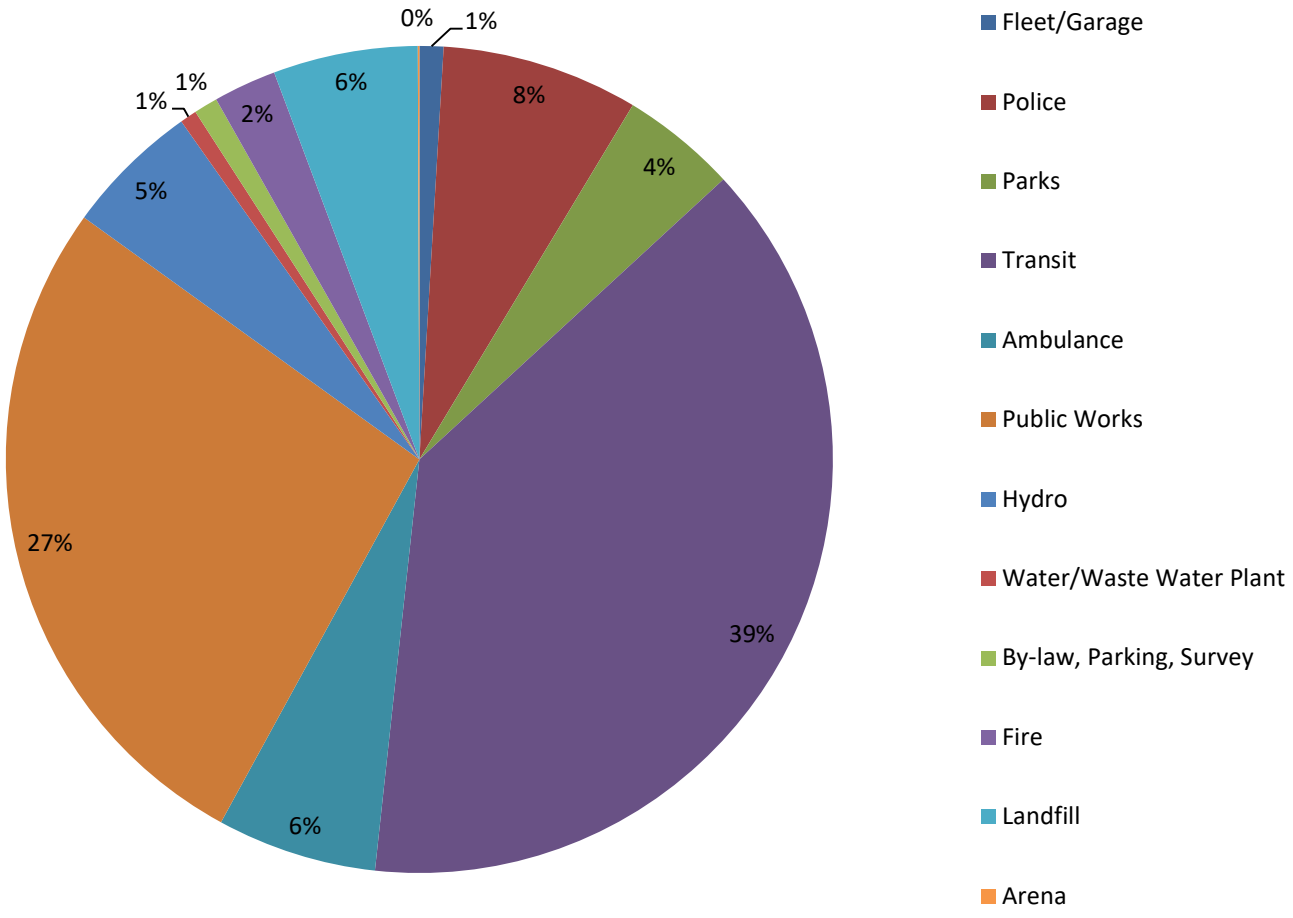


Figure 10 presents the transportation fuel used by the various functions in North Bay during 2024. Detailed annual consumption of transportation fuel data is provided in Appendix 2.3.

Figure 10: Breakdown by Function of 2024 Transportation Fuel Consumption



2.4 Isometrics

Accurately comparing energy consumption from year-to-year requires an appreciation of external factors such as weather and climatic influences. For example, hot summers drive up the demand for air conditioning, cold winters increase demand for heating, damp weather reduces water pumping but can increase pumping at sewage lift stations and at the landfill.

Heating Degree Days (days that average less than 18°C) and Cooling Degree Days (days that average greater than 18°C) can be examined to help understand energy demand at City buildings.

Tables 8, 9, and 10 show that the weather in 2024 was on average slightly cooler than it was in 2010. However, it was similar in temperature in 2024 compared to 2023. Temperature has an impact on energy demands.

Table 8: Average Temperature at North Bay Airport

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly Average
2010	-10.6	-8.9	1.8	7.5	14.2	15.9	20.6	19.3	12.5	6.1	0.5	-8.2	5.9
2011	-8.2	-10.5	-5.9	3.2	12.6	16.6	20.7	18.9	14.7	8.5	2.5	-6.2	5.6
2012	-9	-7	2	4	14	18	20	19	13	7	-1	-7	6.1
2013	-11.6	-11.1	-3.9	1.7	11.7	15	18.3	17.2	12.2	7.2	-3.3	-13.3	3.3
2014	-15.6	-13.3	-10.6	1.7	11.1	16.7	16.7	16.7	12.8	6.7	-3.9	-7.2	2.7
2015	-16.4	-19.2	-7.9	3.4	12.1	14.7	18.5	18.6	17.1	5.6	3.3	-0.5	4.1
2016	-10.5	-11.5	-3.4	-0.1	11.9	15.8	19.1	20	14.7	7.3	3.2	-8.3	4.9
2017	-8.7	-6.5	-8.3	5.8	10.3	15.2	18.4	16.2	15	10.2	-2.6	-15.7	4.1
2018	-12	-9.7	-5.3	-1.7	12.9	16	20.9	19.2	13.9	4.1	-4.7	-8.2	3.8
2019	-16	-11	-6.8	1.9	8.7	15.2	20.1	17.2	12.9	6.9	-4.6	-7	3.1
2020	-8.3	-9.5	-2.4	2.1	9.9	16.8	20.7	17.1	11.7	4.4	2.1	2.1	5.6
2021	-8.9	-10.5	-2.8	6.0	10.8	17.4	17.9	19.8	13.2	10.6	-0.6	-6.4	5.5
2022	-17.5	-12.6	-5	2.9	13.5	15.9	18.2	18.1	13.4	7.5	1	-5.3	4.2
2023	-8.6	-10	-4.7	4.2	10.9	17.2	18.9	16.2	14.9	7.9	-1.8	-3.2	5.16
2024	-8.4	-6.1	-1.1	4.8	13.6	16.5	19.3	18.1	15.6	8	1.9	-6.5	6.31

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly Average
Monthly Average	-11.35	-10.49	-4.29	3.16	11.88	16.19	19.22	18.11	13.84	7.20	-0.53	-6.73	4.68

Table 9: Heating Degree Days at North Bay Airport (number of degrees Celsius that the mean temperature is below 18°C)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly Average
2010	789	670	429	390	335	88	47	18	85	254	402	596	341.9
2011	875	960	783	622	388	120	42	11	47	151	354	530	406.9
2012	837	704	502	429	148	64	20	41	172	339	561	757	381.2
2013	890	793	679	487	202	102	48	64	174	327	613	945	443.7
2014	1002	854	849	478	216	70	70	73	178	340	628	761	459.9
2015	996.4	1041	778	438.8	191.1	100.6	37.1	27.4	68.8	358.5	426.8	481.2	412.1
2016	854.9	856.7	663.4	542.1	201	85.7	24.1	9.2	75.6	213.9	324.8	473.3	360.4
2017	427.9	417.1	709	269.5	170.2	66.9	15.8	59	114.2	203.9	411.1	875.6	311.7
2018	928.4	775.9	720.7	592.2	173.8	75	8.9	16.5	145.5	415.8	680.3	813	445.5
2019	1042.2	811.4	770.3	483.5	288.4	92.2	7	42.7	154.9	320.9	677.9	775.3	455.6
2020	814.9	796.5	632.5	476.8	272.7	75.6	5.6	60.2	188.8	409.2	475	475	390.2
2021	834.7	797.5	645.4	361.3	227.3	49.0	35.6	18.3	145,7	230.5	558.9	756.3	410.4
2022	1099.9	856.9	712.1	453.4	159.7	82.9	28.9	31.3	141.2	283.9	510.3	722.1	423.6
2023	825.9	784.3	702.8	415.9	225.7	53.7	14.9	57.9	113.4	294.7	593.5	635.7	393.2
2024	819	698.8	592.5	369.8	141.6	75.1	13.9	39.7	85.5	299.4	482.9	760.2	364.87
Monthly Average	869.15	787.81	677.91	453.95	222.70	80.05	27.92	37.95	124.56	296.11	513.30	690.45	398.49

Table 10: Cooling Degree Days at North Bay Airport (number of degrees Celsius that the mean temperature is above 18°C)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly Average
2010	0	0	0	12	70	57	168	131	25	2	0	0	38.8
2011	0	0	0	1	37	73	171	113	50	14	0	0	38.3
2012	0	0	5	0	33	64	98	53	19	1	0	0	22.8
2013	0	0	0	1	26	23	76	41	8	2	0	0	14.8
2014	0	0	0	0	10	47	34	38	16	1	0	0	12.2
2015	0	0	0	0	8.1	1.6	52.7	44.9	43.1	0	0	0	12.5
2016	0	0	0	0	11.7	21.6	55.4	61.9	2.1	0	0	0	12.7
2017	0	0	0	0	0.7	1.6	24.8	11.6	30.4	0	0	0	5.8
2018	0	0	0	0	15.3	16	99.7	55	23.8	0	0	0	17.5
2019	0	0	0	0	0	7	73.6	18.3	1.9	0	0	0	8.4
2020	0	0	0	0	22.8	40.8	89.1	31.4	0.9	0	0	0	15.4
2021	0	0	0	0	11.2	30.4	31.3	72.4	0.5	2.0	0	0	12.3
2022	0	0	0	0	21.6	19	34.1	35.4	13.5	0	0	0	10.3
2023	0	0	0	0.5	6.9	31.1	43.9	8.3	20.3	2.4	0	0	9.45
2024	0	0	0	0	3.8	31.3	55.2	43.3	12.8	0	0	0	12.20
Monthly Average	0	0	0.33	0.97	18.54	30.96	73.79	50.57	17.82	1.63	0	0	16.22

Table 11 shows a decrease in precipitation in 2024 compared to previous years, and a decrease compared to the baseline (2011). The peak year for precipitation is 2019.

Table 11: Monthly and Annual Precipitation in millimeters

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly Average
2010	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	62.8	60.6	73.4	133.4	51.6	90.2	62.8	43.2	79.4	126.8	106.4	81.4	81.0
2012	82.2	44	57	70	23.8	115.4	61.8	145.8	102	126	54.2	79.9	80.2
2013	72.4	37.6	32.8	90.2	57.4	59.2	82.3	91.7	68.8	102.9	63.7	31	65.8
2014	69.3	24.4	55.9	67.3	49.3	175.8	241.8	88.9	86.4	77.2	58.4	22.6	84.8
2015	0.9	3.8	20.4	74.2	79.1	57.4	53	92.3	45.2	85.7	66.5	69.1	54.0
2016	54.1	43.2	109	24.3	48.8	52.9	77.6	105.8	67.9	33.6	22.7	26.5	55.5
2017	14.2	36.8	16.1	106	92.8	86.1	71.1	149.4	70.1	104.9	59.5	41.3	70.7
2018	38.2	34.5	11.2	51.9	71.3	27.8	25.1	119.5	121.5	89.8	56.1	52.7	58.3
2019	66.9	70	60	144.7	132.1	107.5	81.4	45.2	146.2	156.8	100.4	53.9	97.1
2020	56.2	37.1	113.3	69.6	76	61.2	99.3	124	151.3	120	68.6	86.4	88.6
2021	22.9	46.7	44.8	48.8	19.4	142.5	169.6	73.0	186.4	127.1	66.4	94.5	86.8
2022	12.4	23.9	101.1	84.3	112.5	101.1	120	106.3	129.6	66.7	45.7	33.4	78.1
2023	37.2	47.5	33.6	119.2	58.7	150.6	81.9	66.3	74.6	105.8	65.5	26.3	72.27
2024	14.8	67.3	73	119.9	58.1	97.8	111	62	93.4	45.2	74	65.4	73.49
Monthly Average	43.18	41.24	57.26	85.99	66.49	94.68	95.62	93.81	101.63	97.75	64.86	54.60	74.76

Appendix 3: Energy Intensity per Building

Table 12 illustrates the energy intensities for the City of North Bay's facilities in 2024 to show which facilities use the most energy per square meter.

Table 12: Energy Intensity of Facilities (2024)

Facility	Energy Intensity (kWh/sqm)
Aquatic Center	270.57
City Hall	193.39
Fire Station #1	160.60
Fire Station #2	83.40
Fire Station #3	76.82
Fire Station #4	73.16
Lee Park Building	251.31
Memorial Gardens Arena	366.31
Merrick Landfill	1.64
Parking Garage	112.27
Pete Palangio Arena	287.74
Public Library	89.65
Public Works	83.58
Sewage Plant	188.80
Transit Station	125.78
Water Treatment Plant	369.72
West Ferris Arena	115.50

Appendix 4: Greenhouse Gas Emissions Reductions

Table 13: Summary of Annual Energy Consumption and GHG Emissions from 2007-2024

2007	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	23,093,067	1,359,460	1,489,778		
Total GHG Produced (Tonnes of CO_{2e})	16,327	2,630	15,166	34,122	34,122

2008	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	22,190,198	1,526,344	1,492,901		
Total GHG Produced (Tonnes of CO_{2e})	15,688	2,952	15,198	33,839	67,961
Reduction Quantity (From Baseline)	902,869	-166,884	-3,123		
Percent GHG Reduction (From Baseline)	3.91%	-12.28%	-0.21%		
GHG Reduction (From Baseline)	638	-323	-32	284	301

2009	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	21,726,052	1,396,581	1,413,296		
Total GHG Produced (Tonnes of CO_{2e})	15,360	2,701	14,387	32,449	100,410
Reduction Quantity (From Baseline)	1,367,015	-37,121	76,482		
Percent GHG Reduction (From Baseline)	5.92%	-2.73%	5.13%		
GHG Reduction (From Baseline)	966	-72	779	1,673	1,974

2010	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	21,839,169	1,246,338	1,398,238		
Total GHG Produced (Tonnes of CO_{2e})	15,440	2,411	14,234	32,085	132,495
Reduction Quantity (From Baseline)	1,253,898	113,122	91,540		
Percent GHG Reduction (From Baseline)	5.43%	8.32%	6.14%		
GHG Reduction (From Baseline)	887	219	932	2,037	4,011

2011	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	22,491,553	1,427,922	1,381,524		
Total GHG Produced (Tonnes of CO_{2e})	15,902	2,762	14,064	32,727	165,222
Reduction Quantity (From Baseline)	601,514	-68,462	108,254		
Percent GHG Reduction (From Baseline)	2.60%	-5.04%	7.27%		
GHG Reduction (From Baseline)	425	-132	1,102	1,395	5,406

2012	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	22,525,177	1,485,839	1,354,793		
Total GHG Produced (Tonnes of CO_{2e})	15,925	2,874	13,792	32,591	197,814
Reduction Quantity (From Baseline)	567,890	-126,379	134,985		
Percent GHG Reduction (From Baseline)	2.46%	-9.30%	9.06%		
GHG Reduction (From Baseline)	401	-244	1,374	1,531	6,938

2013	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	19,755,591	1,433,250	1,339,073		
Total GHG Produced (Tonnes of CO_{2e})	13,967	2,772	13,632	30,371	228,185
Reduction Quantity (From Baseline)	3,337,476	-73,790	150,705		
Percent GHG Reduction (From Baseline)	14.45%	-5.43%	10.12%		
GHG Reduction (From Baseline)	2,360	-143	1,534	3,751	10,689

2014	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	20,098,157	1,705,034	1,726,126		
Total GHG Produced (Tonnes of CO_{2e})	14,209	3,298	17,572	35,079	263,264
Reduction Quantity (From Baseline)	2,994,910	-345,574	-236,348		
Percent GHG Reduction (From Baseline)	12.97%	-25.42%	-15.86%		
GHG Reduction (From Baseline)	2,117	-668	-2,406	-957	9,731

2015	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	20,785,244	1,555,638	1,639,765		
Total GHG Produced (Tonnes of CO_{2e})	14,695	3,009	16,693	34,397	297,661
Reduction Quantity (From Baseline)	2,307,823	-196,178	-149,987		
Percent GHG Reduction (From Baseline)	9.99%	-14.43%	-10.07%		
GHG Reduction (From Baseline)	1,632	-379	-1,527	-275	9,457

2016	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	19,285,175	1,441,921	1,646,865		
Total GHG Produced (Tonnes of CO_{2e})	13,635	2,789	16,765	33,189	330,850
Reduction Quantity (From Baseline)	3,807,892	-82,461	-157,087		
Percent GHG Reduction (From Baseline)	16.49%	-6.07%	-10.54%		
GHG Reduction (From Baseline)	2,692	-160	-1,599	934	10,390

2017	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	18,846,553	1,761,061	1,725,667		
Total GHG Produced (Tonnes of CO_{2e})	13,325	3,406	17,567	34,298	365,148
Reduction Quantity (From Baseline)	4,246,514	-401,601	-235,889		
Percent GHG Reduction (From Baseline)	18.39%	-29.54%	-15.83%		
GHG Reduction (From Baseline)	3,002	-777	-2,401	-176	10,214

2018	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	19,314,353	1,525,834	1,581,446		
Total GHG Produced (Tonnes of CO_{2e})	13,655	2,951	16,099	32,706	397,854
Reduction Quantity (From Baseline)	3,778,714	-166,374	-91,668		
Percent GHG Reduction (From Baseline)	16.36%	-12.24%	-6.15%		
GHG Reduction (From Baseline)	2,672	-322	-933	1,417	11,631

2019	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	19,241,922	1,642,805	1,738,683		
Total GHG Produced (Tonnes of CO_{2e})	13,604	3,178	17,700	34,482	432,336
Reduction Quantity (From Baseline)	3,851,145	-283,345	-248,905		
Percent GHG Reduction (From Baseline)	16.68%	-20.84%	-16.71%		
GHG Reduction (From Baseline)	2,723	-548	-2,534	-359	11,272

2020	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	18,166,035	1,571,067	1,390,461		
Total GHG Produced (Tonnes of CO_{2e})	12,843	3,039	14,155	30,037	462,373
Reduction Quantity (From Baseline)	4,927,032	-211,607	99,317		
Percent GHG Reduction (From Baseline)	21.34%	-15.57%	6.67%		
GHG Reduction (From Baseline)	3,483	-409	1,011	4,085	15,357

2021	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	17,976,611	1,041,471	1,349,895		
Total GHG Produced (Tonnes of CO_{2e})	12,709	2,015	13,742	28,466	490,839
Reduction Quantity (From Baseline)	5,116,456	317,989	139,883		
Percent GHG Reduction (From Baseline)	22.16%	23.39%	9.39%		
GHG Reduction (From Baseline)	3,617	615	1,424	5,656	21,013

2022	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	19,328,872	876,021	1,530,554		
Total GHG Produced (Tonnes of CO_{2e})	13,666	1,694	15,581	30,941	521,780
Reduction Quantity (From Baseline)	3,764,195	483,439	-40,776		
Percent GHG Reduction (From Baseline)	16.30%	35.56%	-2.74%		
GHG Reduction (From Baseline)	2,661	935	-415	3,181	24,195

2023	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	19,303,120	879,321	1,638,134		
Total GHG Produced (Tonnes of CO_{2e})	13,647	1,701	16,676	32,024	553,804
Reduction Quantity (From Baseline)	3,789,947	480,139	-148,356		
Percent GHG Reduction (From Baseline)	16.41%	35.32%	-9.96%		
GHG Reduction (From Baseline)	2,679	929	-1,510	2,098	26,293

2024	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Annual Total	Cumulative Total
Total Quantity Used	19,624,841	799,836	1,639,799		
Total GHG Produced (Tonnes of CO_{2e})	13,875	1,547	16,693	32,115	585,919
Reduction Quantity (From Baseline)	3,468,226	559,624	-150,021		
Percent GHG Reduction (From Baseline)	15.02%	41.17%	-10.07%		
GHG Reduction (From Baseline)	2,452	1,082	-1,527	2,007	28,300

2007-2024 Cumulative	Electricity (kWh)	Natural Gas (m^3)	Transportation Fuel (L)	Total
Total Quantity Used	365,591,690	24,675,743	27,476,998	
Total GHG Produced (Tonnes of CO_{2e})	258,473	47,730	279,716	585,920

Figure 11 illustrates the progress made in the reduction of GHG's generated by fossil fuel consumption by the City of North Bay from 2007 to 2024.

Figure 11: Annual Greenhouse Gas Emissions 2007 to 2024

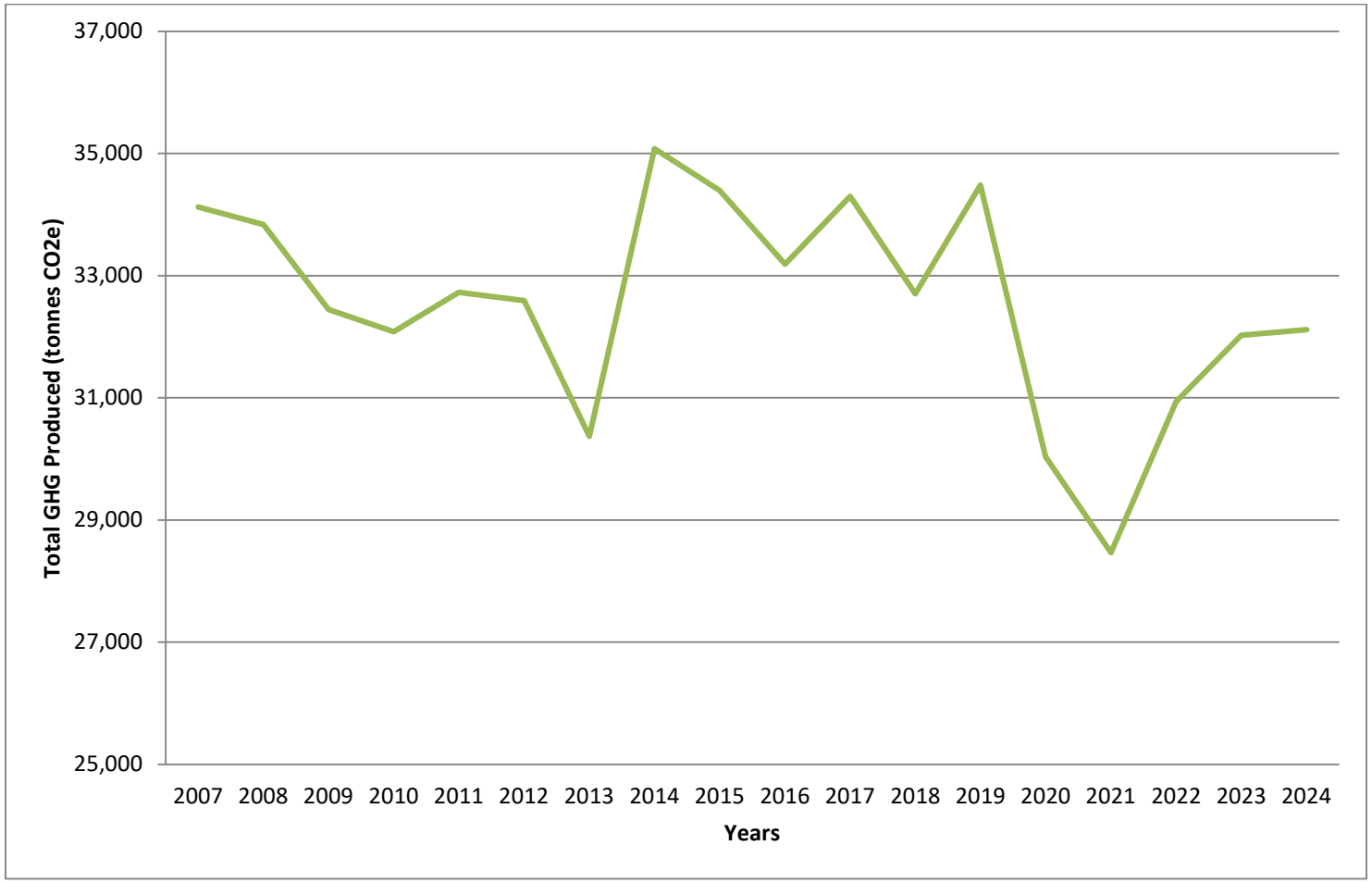
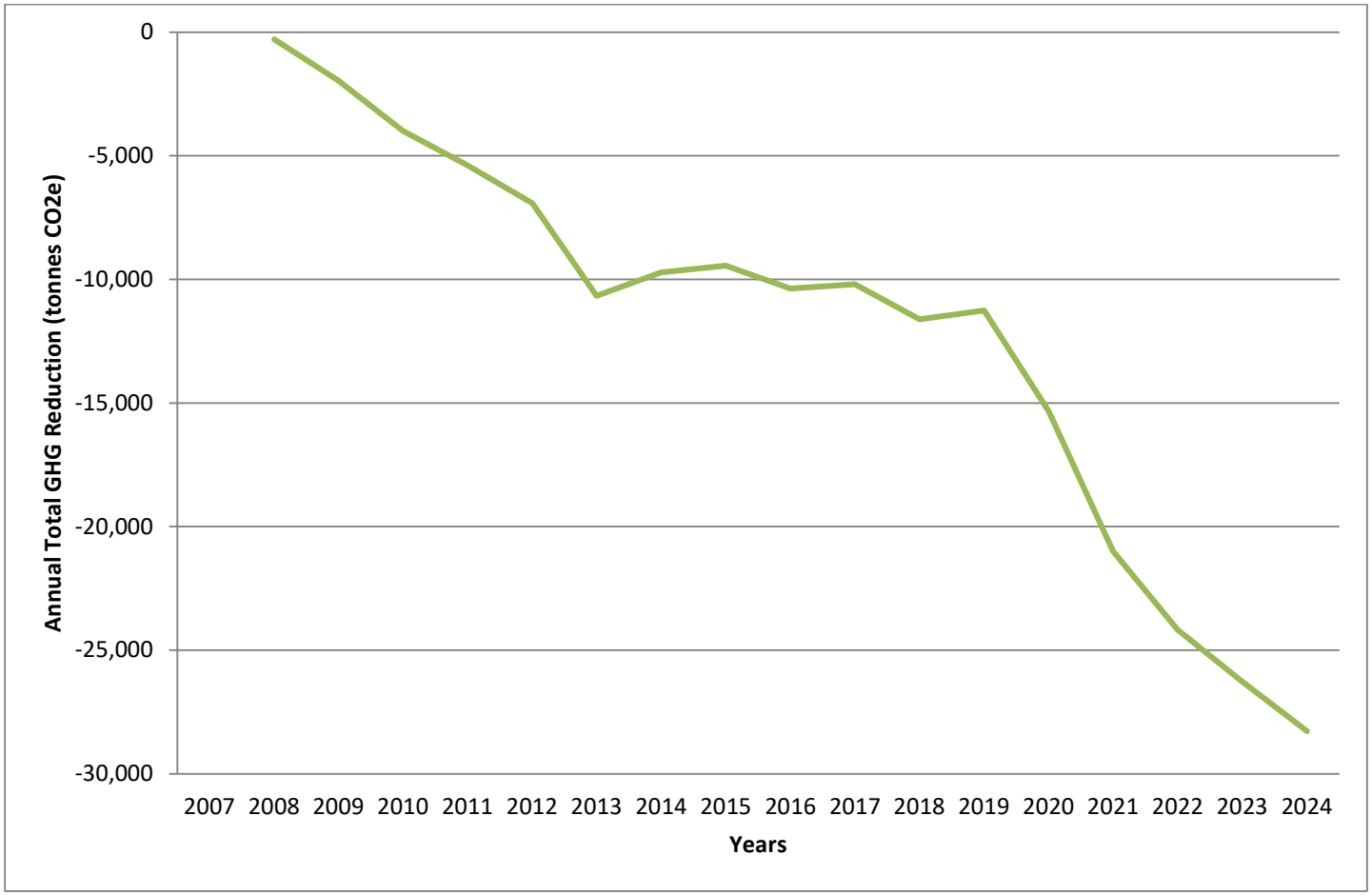


Figure 12 illustrates the cumulative annual reduction of GHG's from 2007 to 2024. By 2024, the City has decreased the amount of GHG's generated by a total of 28,283 CO_{2e} tonnes, an average of 1,664 CO_{2e} tonnes per year.

Figure 12: Cumulative Reduction of GHG's from 2007 to 2024



*This data displays an annual comparison to the baseline operations GHG usage established in 2007.

Appendix 5: Initiated, Completed, and Future Major Energy Projects

Table 14: The City of North Bay's Completed Major Energy Projects

Project	Costs	Savings Realized (per year)	Est. Simple Payback
Replace HPS Street lights with LED Fixtures (2013)	$2,800,800	$281,000	13 years
Replaced Decorative lights	$200,000	$37,500	6 years
Lighting & heating upgrades at YMCA Aquatics Center	$750,000	$75,000	10 years
EMP Mini-Hybrid on City Transit Buses	$268,000	$151,400	2 years
Cogeneration Project at Wastewater Treatment Plant	$3,900,000	$150,940	26 years
Driver Training using Smart Driver Program	$50,000	30,000 L	2 years
Install Residential Water Meters (bill based on use)	$6,063,576	500,000 kWh	
Replace Ellendale pumps with high efficiency motors	$831,109.35	115,480 kWh	
Eliminate Janey Avenue Pumping Station		12,650 kWh	

Table 15: The City of North Bay's Initiated and Future Major Electricity Reduction Projects

Projects	Potential Savings
Continue with revamping/controls in City buildings	25,000 kWh/yr.
*Parking lot lighting review	Being Evaluated
Education and Awareness Training with AMO/LAS	Being Evaluated
Study Sewage Plant low lift pumping system	Being Evaluated
Study improved use of Building automation systems	Future Evaluation
Study to improve water distribution system	Future Evaluation

Table 16: The City of North Bay's Future Major Natural Gas Reduction Projects

Projects	Potential Savings (m3)
Insulate/Seal Garages at Public Works/Automatic Door Closure	25,000
Insulate Roof of City Hall	10,000
Insulate Roof at Fire Station #4	5,000

Table 17: The City of North Bay's Initiated and Future Major Transportation Fuel Reduction Projects

Projects	Potential Savings (per year)
*Reduce Idling	35,000 L
*Reduce Vehicle Weight	10,000 L
*Cull older inefficient vehicles/ Reduce fleet size	7,600 L
*Enhance vehicle preventative maintenance	5,000 L
*Replacement of select vehicles with hybrid/electric alternatives.	Being Evaluated
*Building envelope upgrades at Pete Palangio.	Being Evaluated
*Emission Reduction in Fleet	Being Evaluated
*Improve traffic flows/automate signalization system	Being Evaluated

Note: Projects marked with an asterisk (*) are currently ongoing.