Strategic Energy Management Plan 2024

In partnership with

Executive Summary

The City of Nanaimo has had an active corporate energy management program, in partnership with BC Hydro's Energy Manager Program, since 2009. In recent years, the spotlight has shifted from energy efficiency improvements to Greenhouse Gas (GHG) emission-reducing initiatives, but the importance of energy efficiency projects remains as we attempt to offset additional electrical load from low carbon electrification projects used to reduce GHG emissions.

An in-depth condition assessment review of significant facilities began in 2019. This has led to an increased understanding of the current condition of assets within these facilities, identification of opportunities to pair asset renewals with energy efficiency and low carbon electrification projects, and estimated budgets required to maintain the current level of service.

In 2024, with the assistance of Federation of Canadian Municipalities (FCM) and Community Buildings Retrofit initiative funding, a GHG Pathways Study was conducted, including eight of the City's highest GHG-emitting facilities. This will provide guidance as to the resources necessary to meet or exceed the City's 2030 and 2050 GHG targets. Throughout these studies, project participants have been mindful to consider recommended measures, along with asset renewals, where possible. This means the City would not be replacing assets mid-life, for the sole purpose of GHG reductions. Additionally, there has been consideration of fit-for-purpose design, ensuring appropriate level technology is implemented in facilities to support cost effective delivery of service.

Once the eight pathway studies are complete, it is anticipated that sufficient energy conservation measures will be identified that, once implemented, could be sufficient to meet the City's 2030 and 2050 targets.

This Strategic Energy Management Plan focuses on facilities used to deliver what are referred to as "Traditional Services" under Local Government Climate Action Program (LGCAP) reporting. This allows comparison with other municipalities reporting GHG emissions to LGCAP regardless of the secondary, or non-traditional services offered to the community. Inclusion of facilities delivering non-traditional services may be considered in the future, to provide a holistic view of the complete portfolio as they are still equally important.

Energy and GHG Targets

The City's first GHG emission reduction timeline target of 50-58% reduction below 2010 levels is only about five years away, in 2030. This year's SEMP highlights the need to focus efforts on energy efficiency and GHG emission reduction measures if this target is going to be reached. The GHG Pathway studies have not been finalized and the recommendations have not been incorporated into this year's Strategic Energy Management Plan (SEMP). These will be incorporated into the project planning cycle of 2025 and reflected in the 2025 SEMP.

The City has a 2024/2025 energy reduction target of 50,000 kilowatt hours (kWh) and a 2025/2026 energy reduction target of 100,000 kWh, for a total contract target of 150,000 kWh over the duration of the current 2-year Energy Manager contract with BC Hydro.

Progress to Date

During the Energy Management Program, the City has made significant progress in energy reduction. Within existing buildings, the City has always met its 1% annual energy reduction target. This has allowed operational utility costs to remain manageable, despite consistent annual utility rate increases.

The City has successfully saved **nearly 7 million kilowatt hours of electricity**, **23 thousand gigajoules of natural gas, over 37 thousand liters of heating oil** in *Booked Savings*[1], **and avoided costs over $11.5M** in estimated cumulative utility savings since 2009.

Figure 1: Total Corporate Greenhouse Gas Emissions (tCO2e)

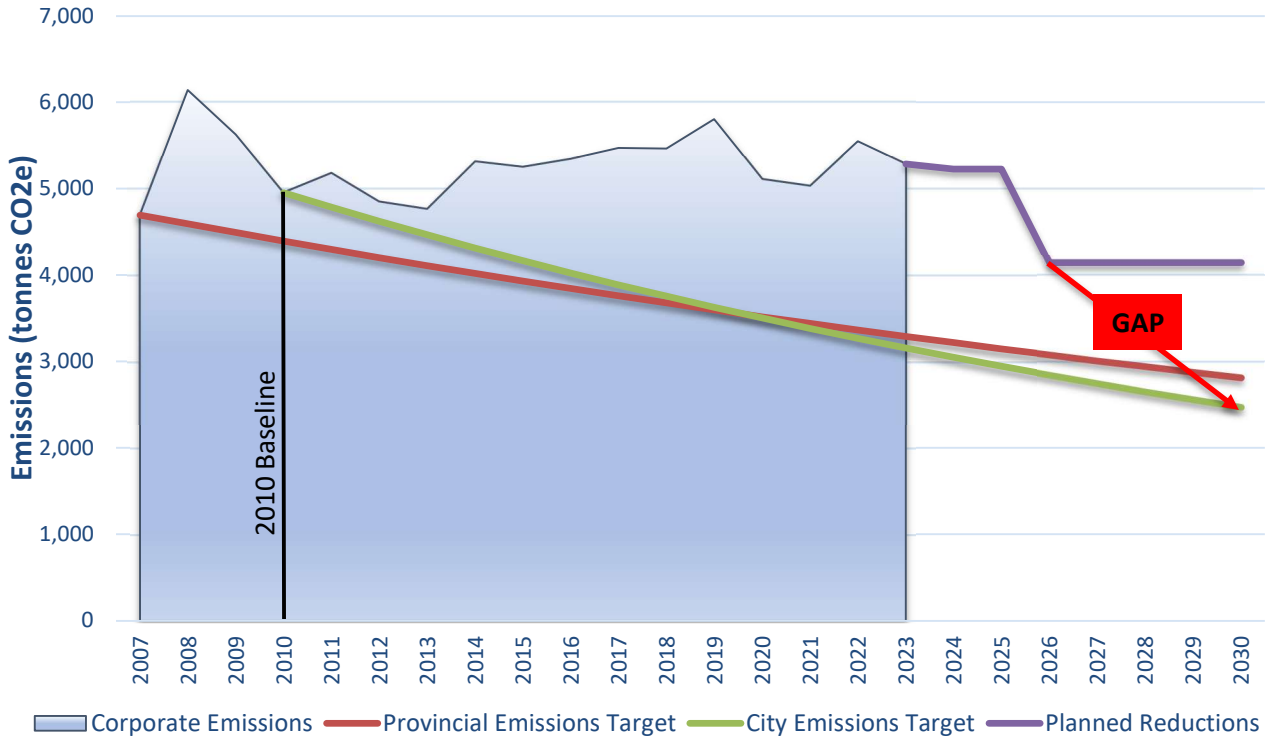

Figure 1 illustrates planned and budgeted GHG reduction projects. Over the next few years, while these planned projects are implemented, further planning will be completed to meet the 2030 targets.

[1] Booked savings reflect the calculated energy or emission savings based on an implemented design strategy. Changes in weather, operational hours, or staffing levels can affect actual energy and emission savings.

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Abbreviations

Abbreviation	Meaning
EE	Energy Efficiency
ekWh/m2	Equivalent kilo-watt-hours per square meter (of floor space)
eGWh	Equivalent giga-watt-hours
EMA	Energy Management Assessment
EUI	Energy Use Intensity
FAM	Facility Asset Management
FCM	Federation of Canadian Municipalities
CBR	Community Buildings Retrofit
GHG	Greenhouse Gas
GHGi	Greenhouse Gas Intensity
GJ	Gigajoule
IPCC	Intergovernmental Panel on Climate Change
kWh	Kilowatt Hour(s)
LCE	Low Carbon Electrification
LGCAP	Local Government Climate Action Program (formerly CARIP)
LED	Light Emitting Diode (lighting)
PUMA	Prism Utility Monitoring and Analysis
SEMP	Strategic Energy Management Plan
tCO2e	Tonnes of Carbon Dioxide Equivalent

1.0 Purpose

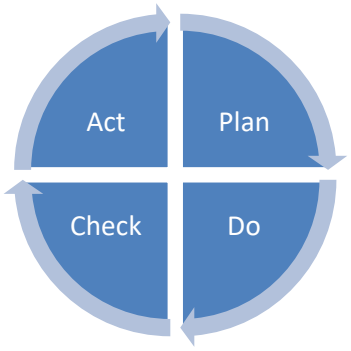
This Corporate Strategic Energy Management Plan (SEMP) is the City of Nanaimo's (City) forward-looking business plan for reducing energy consumption, utility costs, and greenhouse gas (GHG) emissions from corporately owned facilities, fleet vehicles, operating equipment, and outdoor spaces.

The SEMP details the City's plan towards emission reduction targets and improvements to energy efficiency.

Meeting these targets will require significant investment in asset renewal measures, including electrification, energy conservation, and other reduction measures for both facilities and fleet. Continuous improvement of energy efficiency and system optimization throughout the organization will also be key to reaching the targets.

This plan:

- Sets corporate objectives and targets and provides a realistic plan for achievement (Plan)
- Works within the City's available resources to implement actions (Plan)
- Provides a realistic plan for achieving them (Do)
- Sets benchmarks and tracks progress to measure success (Check)
- Identifies opportunities and areas for improvements (Act)
- Continually improves the process of all the actions listed above (Plan, Do, Check, Act)



The SEMP is a requirement of the Commercial Energy Manager Program Agreement between the City and BC Hydro, which provides funding towards the City's Manager, Corporate Energy position.

The Corporate Energy Manager works with staff and stakeholders when determining what changes are needed to the SEMP each year and submits the updated plans to BC Hydro.

2.0 Commitment

2.1 Organizational Alignment – Emission Reduction

Prior to 2019 the City used the Provincial Climate Action Targets aimed at reducing emissions by 33% of the 2007 levels by 2020. In April 2019, recognizing the global concern raised by the International Panel on Climate Change (IPCC) to limit global warming to 1.5°C, Nanaimo City Council aligned with the IPCC Special Report on Global Warming, declared a climate emergency, and set new community-wide emissions reduction targets:

- **50% to 58% below 2010 levels by 2030**
- **94% to 107% below 2010 levels by 2050**

These City-adopted targets are even more rigorous than the 2022 BC Government legislated GHG emission targets for 2030, 2040, and 2050 of 40%, 60% and 80% below 2007 levels.

Further illustrating the City's commitment to taking action to address climate change, City Council's 2023-2026 Strategic Framework includes the following statement:

> ***"We recognize the importance of planning for the future, particularly for climate change and emergencies, and creating a roadmap to guide our actions and decisions."***

In 2022, Nanaimo City Council adopted City Plan Bylaw 2022 No. 6600: Nanaimo ReImagined. This document includes clear identification that GHG reduction is a key issue that requires strategic action in greener buildings and infrastructure, zero carbon mobility options, less waste, and other measures—bringing together the City's Climate Action Plan, Official Community Plans, and Climate Change Resiliency Plan.

In 2024, Nanaimo City Council adopted a new Sustainable Buildings Policy (Appendix D) replacing the former Green Buildings Policy. The updated Policy aligns with the organization's recently adopted City Plan Bylaw 2022 No. 6600 and considers a holistic approach to construction activities. The new policy no longer pursues a proprietary certification, but instead targets the specific goals of City Plan Bylaw 2022 No. 6600.

2.2 Organizational Alignment – Energy Efficiency

In addition to GHG emission reduction targets, the City's Energy Conservation and Management Policy (Appendix E) has a target to reduce overall energy consumption within existing buildings by 1% per year. Where new buildings or additions to existing buildings are required, the energy intensity of the new construction is to be less than the energy intensity of existing facilities of similar use.

In 2019, one of the City's Energy Management Assessment actions included a challenge to set an energy reduction target that accounted for both capital projects and non-capital activities, preferably based on intensity. As a result, the Corporate Energy Manager set a target for reducing the energy intensity of

facilities by 30% by 2030, compared to a 2008 baseline. This baseline year was chosen as it coincided with the creation of the Energy Manager role within the City.

It is planned that the Energy Conservation and Management Policy will be reviewed and updated in 2025, to refresh and align with the progress to date, and City Plan Bylaw 2022 No. 6600.

2.3 Stakeholders Engagement Plan

Acknowledging and collaborating with stakeholders is essential in ensuring the SEMP is successfully delivered with the results expected. The SEMP summarizes progress to date, allowing the staff involved with energy and emission reduction projects to assess progress and adjust planning as needed.

The Energy Manager meets quarterly with BC Hydro and internal stakeholders to update progress on the project plan and to facilitate updates from both organizations. One of the quarterly meetings per year includes the City's Senior Management. This ensures up-to-date information on current progress and future planning is elevated within the organization.

In addition to structured meetings, daily communication and collaboration occurs between the Energy Manager and Facility Managers and Supervisors to share information and gather feedback.

Facility Managers are included in annual project planning, and design and implementation discussions to ensure project deliverables meet the facility's operational requirements and to ensure buy-in from operational staff.

As part of this engagement and buy-in, an assessment is conducted every two to three years, where key stakeholders are required to participate, driving the direction of the organization's energy and emissions reduction plan. The next EMA to engage stakeholders and set new priority action items will be taking place in the spring of 2026.

3.0 Organizational Analysis

3.1 Organization Profile

The following is a brief snapshot of the City's corporate profile:

- About 200 owned sites consuming varying amounts of energy,
- About 700 Staff[2],
- About 123,000 m^2 of building floor area,
- More than $ 5.2million spent on energy in 2023 to operate buildings, and fuel vehicles and equipment, and
- Emitted 5,287 tonnes of carbon dioxide equivalent (tCO_2e) in 2023.

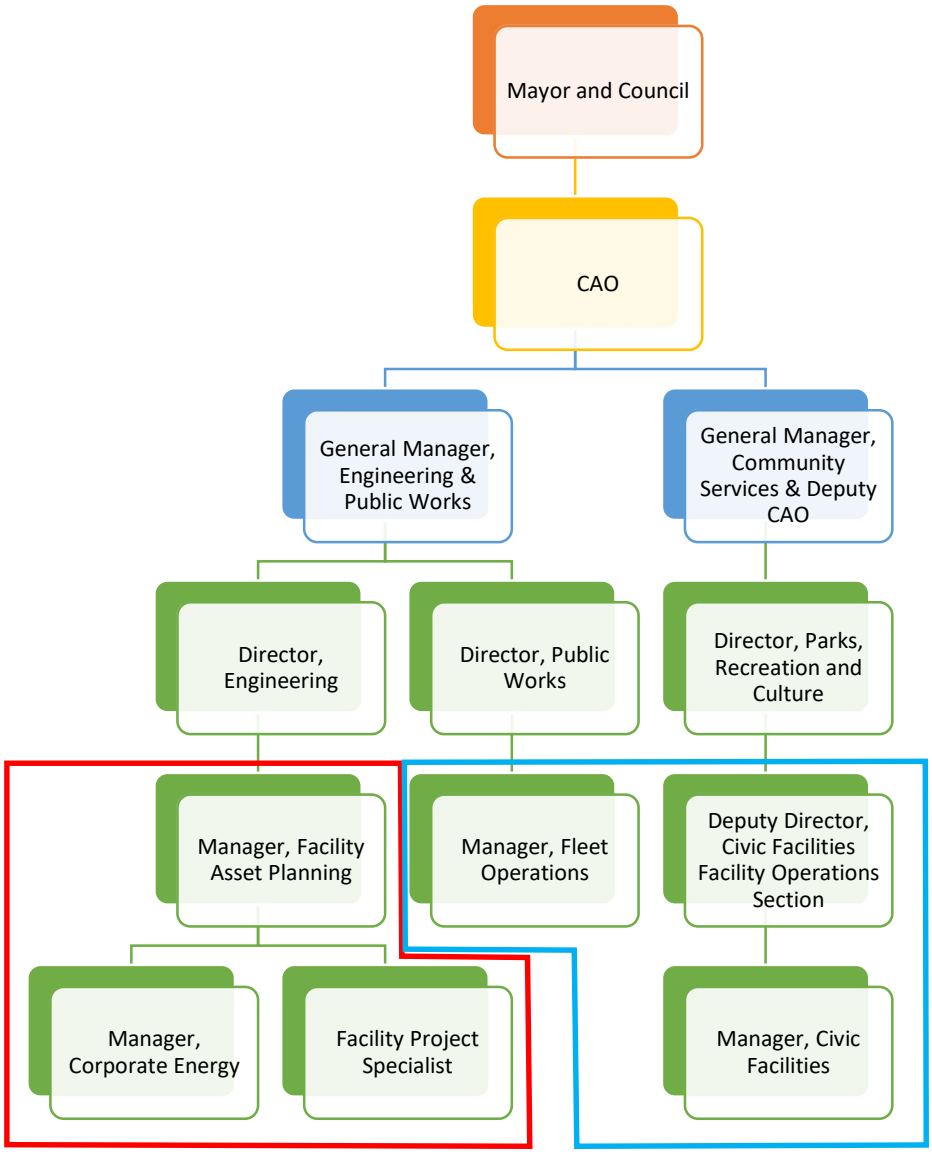
[2] Staff include permanent full-time and part-time employees, and does not include RCMP, Council, permanent auxiliary, or casual employees.

3.2 Key Stakeholders

The following are the sponsors and key stakeholders that ensure the success of the organization's corporate energy and emissions initiatives:

Dale Lindsay	Chief Administrative Officer	City of Nanaimo
Bill Sims	General Manager, Engineering & Public Works	City of Nanaimo
Richard Harding	General Manager, Community Services & Deputy CAO	City of Nanaimo
Laura Mercer	General Manager, Corporate Services	City of Nanaimo
Poul Rosen	Director, Engineering	City of Nanaimo
Wendy Fulla	Director, Finance	City of Nanaimo
Darcie Osborne	Director, Parks, Recreation & Culture	City of Nanaimo
Mike Bryson	Deputy Director, Civic Facilities	City of Nanaimo
Jennifer McAskill	Manager, Facility Asset Planning	City of Nanaimo
Emil Bock	Manager, Corporate Energy	City of Nanaimo
Mark Demecha	Manager, Civic Facilities	City of Nanaimo
Brandon Miller	Manager, Fleet Operations	City of Nanaimo
Meaghan Fahey	Key Accounts Manager	BC Hydro
Jay Lee	Program Manager, Strategic Energy Management Program	BC Hydro
Elizabeth Manhas	Key Account Manager	Fortis BC

The Energy Team reports through the Director and General Manager levels, and ultimately through the Chief Administrative Officer to Mayor and Council. The following chart focuses on the more pertinent relationships for energy and emissions management and does not represent the entirety of the organization. The area marked with a red line below indicates the primary Energy Team members who liaise with other management and staff within the organization; primarily those outlined in blue.



3.3 Benefits of Energy and Emission Savings

There are many benefits to the City for undertaking energy conservation and emission-reduction measures. Some of the more common benefits include:

- Avoids costs by offsetting increasing utility costs either from fuel switching or general inflation.
- Avoids or delays costly electrical service upgrades as electrical needs increase.
- Seeks the most efficient use of utilities to avoid energy waste and emissions.
- Reduces overall electrical grid impact and is considered good grid stewardship.
- Renews assets while leveraging available grants, thus reducing municipal funding required.

3.4 Opportunities and Challenges

Through grant funding provided by Green Municipal's Fund Community Building Retrofit initiative, the City is undertaking a GHG Pathway study at eight of the largest GHG-producing facilities and identifying energy conservation measures that will reduce GHG emissions by 50% in 10 years, and 80% in 20 years. Due to this study, several facility asset renewal projects have been deferred in the capital plan until the findings are available to help prioritize and identify synergies amongst the projects with impact to GHG emissions, and energy consumption. These pathway studies will identify optimal systems to upgrade for overall efficiency, identify appropriate efficiency technology, show opportunities to lower GHG emissions, and where possible, improve patron's facility experience.

Another opportunity the City is capitalizing on is the Continuous Optimizations, or COps through BC Hydro. COps review building system operations in partnership with BC Hydro and determine if those systems are operating as intended, and what (if any) improvements can be made for energy efficiency and occupant comfort. These reviews typically target easily implemented adjustments to the building systems, optimizing the building's function.

Resourcing remains a constraint on progress. As with any municipality, the City must balance the various needs of the community, and allocation of resources. Funding for large capital projects can be supplemented by grants and other external sources when available, however these still need staff to oversee the delivery of the project. Impact to services must be coordinated with facility staff and user groups and be timed with community obligations that are sometimes booked well in advance. Lastly, the simple fact of cost of utilities must be considered to ensure initiatives don't create a trailing, operational burden at the facility.

3.5 Energy Management Assessment

As part of the Commercial Energy Manager agreement between BC Hydro and the City, every 2-3 years an Energy Management Assessment (EMA) is facilitated by an external consultant, who leads a stakeholder-based workshop to comprehensively review key energy management areas of influence.

The purpose is to identify aspects of the program that can be strengthened to deliver even higher levels of energy efficiency and conservation. The last workshop was held July 15 and 18, 2022 with the following recommended areas of focus:

Table 1: EMA Recommended Actions	Current Status of Actions
Business Leadership	
Ensure all members of the Senior Leadership Team review and approve the Strategic Energy Management Plan (SEMP) and related policy documents.	Q4 (2024) - SEMP review and approval
Present to top management on what is happening and importance of the SEMP. Present impact of not taking action and non-energy benefits.	Q1 (2025) - SEMP review and approval
Educate Council on the Strategic Energy Management program, making decision-makers aware so they can make better decisions. Make aware of investment requirements to meet targets and commitments.	Q2 (2025); Requires completion of studies: Building Portfolio - GHG Pathways to Net-zero, and Beban Complex HVAC Optimization.
Business Investment	
Leverage non-energy benefits, especially carbon reduction to help move projects forward. Also, the social, environmental and political benefits.	Q2 (2025) – GHG Pathways studies, 2025 Capital Planning, SEMP review and approval
Business Plan	
Report on Strategic Energy Management Plan status and program progress on a regular basis to senior management and other user groups. Communicate in digestible way depending on audience.	Q1 (2025)
Refresh energy policy and consider ways to integrate with other related policies: 1) Green Building Policy - new construction (completed) 2) Energy Management Conservation Policy	 Q2 - Q3 (2024) Q4 (2025)
Reconsider energy project decision making criteria stipulated within existing policies (i.e. not just 8 yr. simple payback, but total Life Cycle Costing (NPV) and non-energy benefits).	Q4 (2025) Energy Management Conservation Policy
People - Roles	
Have Energy Manager position report to senior management/Council on a more regular schedule than every 2 years.	Q2 (2025)
Engage a cross-departmental team with representation from as many departments as possible (e.g. zero-waste task force).	Every Quarterly Presentation (2025)
People - Accountability	
Find ways to understand why people are not behaving as though they are accountable for energy.	Ongoing: increased COps to investigate. Aged building systems do not permit high-value control.
Leverage education and awareness as a way to increase accountability for responsible energy use/waste. Communicate that people can do certain things.	Q4 (2025)
Operations - Design	
When involving staff, clearly set boundaries and limitations, especially as it relates to budget constraints as to what suggestions can move forward.	Q2 (2025) Capital Planning
During renovations & new construction, look at long term vision for space usage to avoid duplication of future efforts.	Ongoing (every opportunity)
Leverage grant funding including CleanBC New Construction Program where suitable.	Ongoing (every opportunity)

4.0 Energy Analysis

Energy consumption can fluctuate in all buildings, depending on use, environmental conditions, and other factors. Recreation facilities are the highest consumers of energy, which is as expected based on the complex building systems and required interior conditions. Of the highest contributors, the City's two indoor pools, followed by the three ice arenas are the largest contributors of building emissions.

The City's efforts continue to focus on opportunities which have the greatest potential to reduce GHG emissions and energy consumption, prioritizing those facilities that can show the most effective reductions.

4.1 Energy and GHG's by Facility Type

Figure 2a below illustrates the share of total emissions produced by each facility type.

Figure 2a: Percentage of Total GHG Emissions by Facility Type

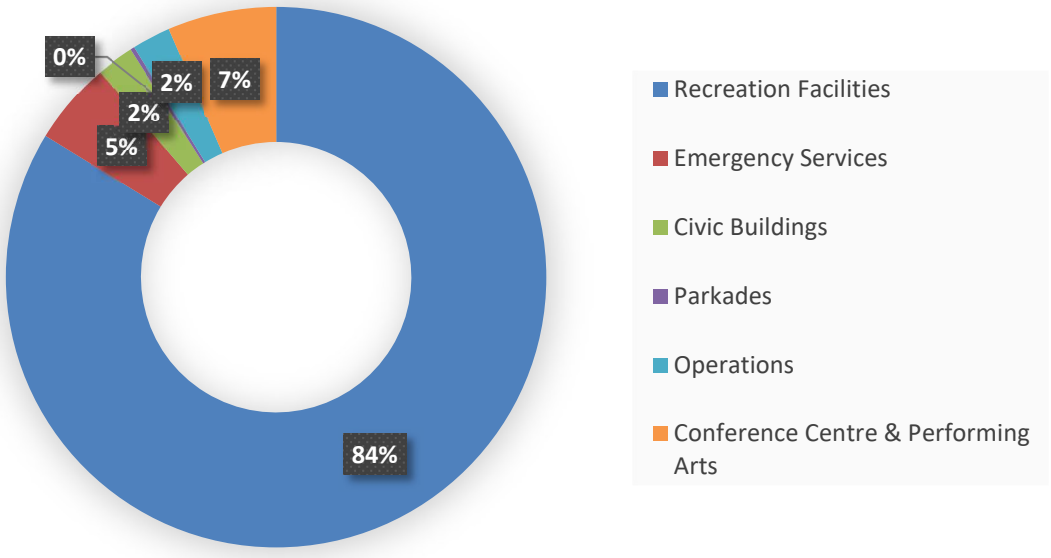
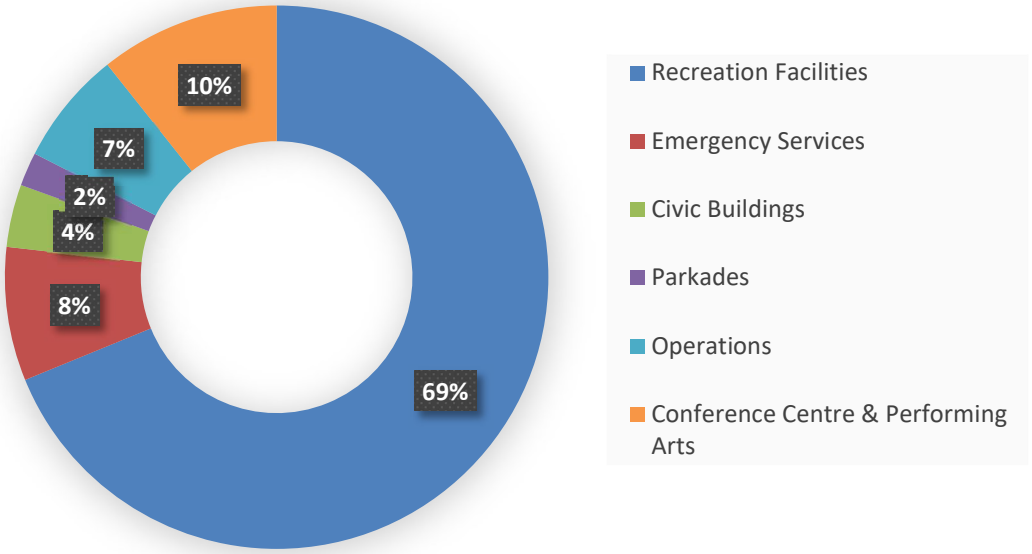


Figure 2b below illustrates the share of total energy consumed by each facility type.

Figure 2b: Percentage of Total Energy by Facility Type



Operations facilities included in both Figures 2a and 2b include facilities that support City function, such as Public Works, Parks Yard and annex.

In 2023, recreation facilities produced approximately 84% of emissions from facilities and consumed about 69% of all facility energy.

4.2 Year-Over-Year Energy Consumption by Energy Source

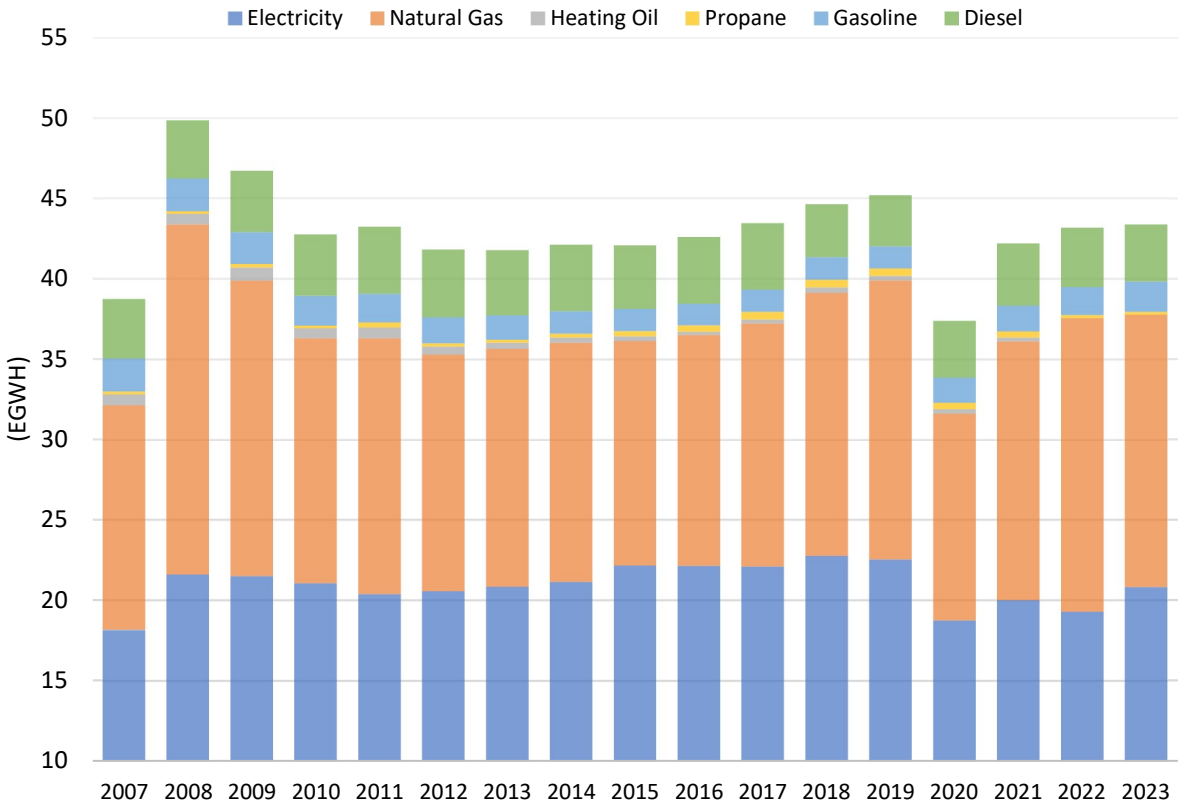
Figure 3 shows electricity use has remained fairly consistent since 2008, despite changes in the facility portfolio and the addition of electric vehicle chargers. The City's electric vehicle chargers are fed from the host facility, and not separately metered, including this transportation implication in the overall facility electricity use.

Natural gas consumption has decreased since 2008, but additional reductions are still required to meet 2030 GHG reduction targets.

Propane has seen a reduction in consumption by over 50% since 2008, and heating oil has been phased out of all facilities.

One gigawatt-hour is equal to 10 million kilo-watt hours.

Figure 3: Facility Fuel Consumption

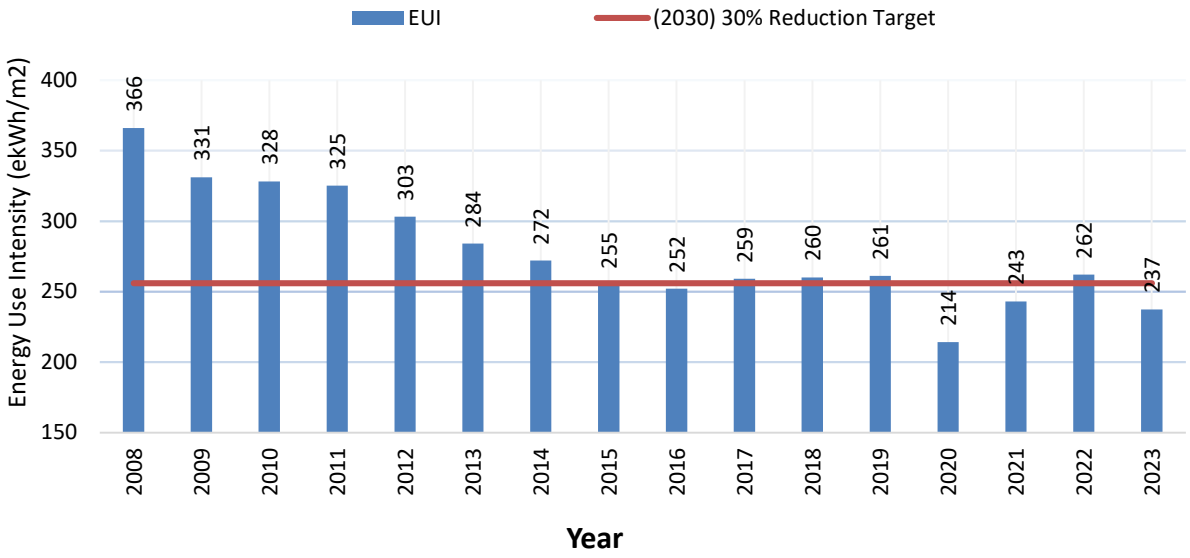


5.0 Actions

5.1 Energy Use Intensity of Building Portfolio

The City tracks Energy Use Intensity across the portfolio. Energy intensity if a ratio of the amount of energy used by a facility (either natural gas or electricity) per unit of area in a building. Figure 4 below illustrates the City's overall progress toward the 30% EUI reduction target against the 2008 baseline. The graph shows that in 2023, the major facilities included in the original baseline surpassed the target by 5.2%. With the update of the Energy Conservation and Management Policy, there is the opportunity to establish a new reduction goal, and a pathway to achievement.

Figure 4: Facilities Average Energy Use Intensity (EUI)



A web-based application, Energy Star Portfolio Manager is an interactive resource management tool that enables the benchmarking of energy use within facilities, and comparisons against other facilities of similar use across Canada. Table 2 below demonstrate how GHG intensities vary throughout the City's building portfolio and how they compare to the national median, based on similar use. Energy Star Portfolio Manager plays a role in assisting us prioritize energy and emissions reducing projects.

Natural gas was not available on Vancouver Island when a number of the older buildings in the portfolio came online. As a result, some buildings are less GHG intensive than the national average having been originally outfitted with electric heating plants. Over time, some of these buildings have received upgrades that included natural gas fired equipment, bringing the GHG intensity more in line with the national average.

Some of the higher consuming facilities (eg. Nanaimo Aquatic Centre, Beban Park Recreational Complex) have known operational challenges resulting in higher consumption of natural gas. City Staff are working to address these challenges and reduce the natural gas consumption.

Table 2: ENERGY STAR Portfolio Manager: Current Key City Owned Buildings (currently in program)			
Property Name	**Energy Use Intensity (GJ/m²)**	**Current GHGi (kgCO2e/m²)**	**Current National Median (Location-Based) GHGi (kgCO2e/m²)**
Nanaimo Aquatic Centre	5.06	204.5	31.1
Beban Park Recreational Complex [4]	2.81	128.8	37.9
Cliff McNabb Arena	2.26	49.6	35.5
Beban Park Pool	1.72	88.3	46.3
Nanaimo Ice Centre	1.62	42.2	44.1
Fire Station 4	0.94	25.2	22.2
Fire Station 3	0.93	29.3	27.5
Port Theatre	0.92	10.7	8.1
Port of Nanaimo Centre	0.90	18.2	16.1
Police Operations	0.89	8	6.2
Fire Station 2	0.86	21.7	20.4
Oliver Woods Community Centre	0.84	15.9	11.4
Public Works	0.84	15	13.1
Nanaimo Curling Club	0.81	18	27.5
Service and Resource Centre	0.68	7	8.8
City Hall	0.62	16.8	22.1
Nanaimo Art Gallery	0.56	2.4	2.8
Bowen Park Recreation Main Building[3]	0.41	20	41.4
Police Operations Annex	0.40	11.2	23.7
Vancouver Island Military Museum	0.29	1.2	4.1
Frank Crane Arena [4]	0.15	7.5	121
Beban Social Centre [4]	0.01	0.5	57.6

[3] Excludes Kin Pool

[4] Parameters are incomplete and require revision to accurately reflect a shared heating plant between Beban Social Centre, Beban Pool, and Frank Crane Arena. Collectively these facilities make up the services provided in Beban Park Recreational Complex

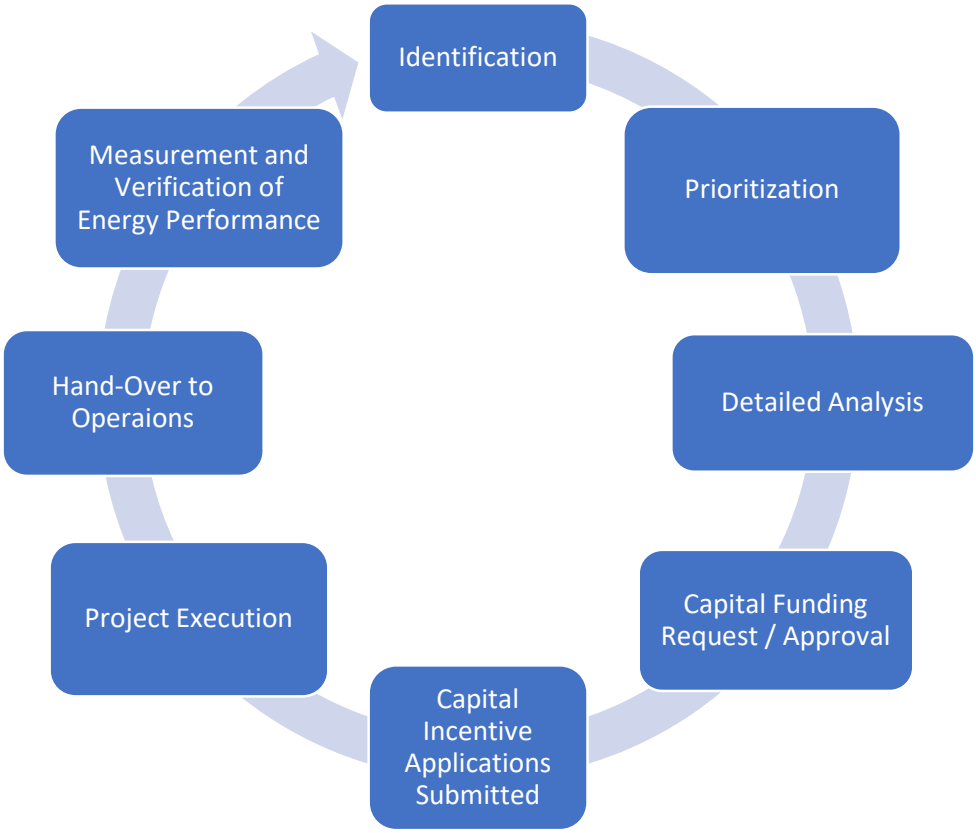
5.2 How does the City reach the targets?

Given progress to date and the current year emission levels, to reduce corporate emission by 50% - 58% of the City's 2010 baseline by 2030, the City must cut emissions by at least 2,809 tCO2e from 2023 levels. Reaching the 2030 and 2050 targets will require significant efforts and investments especially in the following areas:

Optimize Existing Assets	• Plan and prioritize equipment and systems renewals to meet established targets. • Maintain regularly scheduled checks, calibrations, and testing to ensure equipment and systems are operating as per design.
Efficiency & Electrification	• Replace end-of-service life mechanical and electrical equipment and systems with improved efficiency. • Replace fossil fuel burning equipment with electric or other clean energy options.
Deep Retrofits	• Convert to lower temperature heating systems, where possible. • Upgrade building envelopes when deemed appropriate.
Renewables	• Install renewables like solar photovoltaic, geo-exchange, andwastewater heat recovery and cooling systems where suitable. • Investigate additional energy generation from domestic water supply system.

5.3 Project Planning

Project planning is an iterative process with regular review and consideration of projects and asset renewals in relation to the City's priorities.



5.4 Prioritization of Energy Projects

Projects need to be prioritized to match the needs, service levels, and climate action targets. Some of the key elements considered are:

1. Asset management, (Standard useful life, current age & condition, and any potential risks of current condition).
2. Total cost of ownership. (Lowest initial capital investment Vs. targets & trailing utility cost increases from fuel switching).
3. GHG reduction potential.
4. Energy savings potential.
5. Serviceability of replacement systems.
6. Potential to improve service levels.

The planned update to the Energy Conservation and Management Policy in 2025 includes development of a Decision Matrix Tool. This tool will assist staff in making asset renewal decisions where energy & GHG emission reduction potential exists.

5.5 Multi-Year Action Plan - Project List

Each year, the Energy Team meets with Facility Managers and Operations & Maintenance staff to discuss strategic priorities and provide updates to Table 3: Multi-Year Action Plan - Project List. This list identifies projected electricity and fossil fuel savings where studies have been completed and data has been generated, but also identifies where further study is required to identify potential savings.

Table 3 highlights year-by-year studies, planned projects, and asset renewal opportunities which may yield energy and emissions reductions. Activities coded in **blue** represent studies and design and therefore do not list saved kWh's, GJ's of fuel, or tCO2e. Activities coded in **green** represent construction and list Booked Savings which are estimated and recognized as savings. Changes in weather, operational hours, or staffing levels, can affect actual energy and emission savings.

Table 3: Multi-Year Action Plan - Project List										
2023- 2030 Projects				Activity: D = Design C = Construction S = Study N = Nominal N/A = Not Applicable/Available TBD = To Be Determined						Status C = complete IP = in progress
City Budget Year (Jan-Dec)	Program Type	Location & Project Description	In Cap. Plan?	Estimated Project Cost	Year Costed	Activity Type	Saved kWh/yr	Saved GJ/yr	Saved tCO2e/yr	-
2023	City Funded + Grant?	BPRC - HVAC Optimization and Feasibility Study	Y	$100,000	2022	S	N/A	N/A	N/A	IP
	City Funded + BC Hydro Funding	EV Ready Fleet Study	Y	$50,000	2023	S	N/A	N/A	N/A	C
	City + BCH incentive	PoNC - Lighting Audit / Preliminary Design	Y	$32,500	2023	S	N/A	N/A	N/A	C
	CleanBC Custom	PT - Replace Chiller with VRF HP System	Y	$1,042,005	2020	C	-135,897	2,145	105	C
	City Funded	PW - Fleet Maint. - Upgrade lighting to LED - Mech. Offices, Storage Rm, Tool Storage, Mgr. and Admin offices	N	$8,093	2023	C	1,168	N/A	0.01	C
	City Funded	PW - Main Admin Bldg - Upgrade lighting to LED- Front Reception and office admin areas	N	$6,120	2023	C	229	N/A	0.0026	C
	City Funded	Animal Shelter - Replace oil furnace with 2.5T heat pump	Y	$15,856	2022	C	N/A	TBD	4	C
	City Funded	Song Bird Walkway Lighting	N	$2,270	2023	C	1,405	N/A	0.016	C
	City Funded	BP - Upgrade Parking Lot Lighting - (Pool, SC and entrance)	Y	$59,747	2023	C	3,430	N/A	0.19	C
	City + CleanBC Funded	FS 2 - Replace RTU #1	Y	$19,235	2022	D & C	1,992	TBD	TBD	C
	City + CleanBC Funded	FS 3 - Replace RTU #2	Y	$20,695	2022	D & C	610	TBD	TBD	C
	City + CleanBC Funded	PA - Replace 1 - 7.5 ton HVAC RTU with all electric heat pump	Y	$30,026	2022	C	TBD	TBD	TBD	C
	City Funded	Fleet - Purchase two F-150 (electric) Ford Lightning Trucks	Y	$170,000	2023		TBD	TBD	TBD	C
	City Funded	Bastion - Remove and dispose of existing wall wash lights and install with new marine grade lights.	Y	$19,500	2024	C	TBD	N/A	N	IP
		2023 Total		**$1,576,047**			**-127,063**	**2,145.0**	**109.2**	

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2024 Approved	City Funded + Grant	NAC - HVAC Renewal - AHU-1 and AHU-2 with heat recovery, partial ASHP, condensing boiler retrofit	Y	$200,000	2022	D	TBD	TBD	TBD	IP
	City	Bowen - Dark Skies Lighting Study	N	TBD	2024	S	N/A	N/A	N/A	IP
	City Funded + BC Hydro	SARC - HVAC Continuous Optimization Program (COP) - Investigation Phase	Y	$10,000	2024	S	N/A	N/A	N/A	IP
	City Funded	NAC - Leisure Pool Wave Generator Energy Study	N	$3,000	2024	S	N/A	N/A	N/A	C
	City Funded + Clean BC	NIC - Ice Rink Dehumidifier Replacement and Electrification Feasibility	Y	$54,450	2024	S, D	N/A	N/A	N/A	IP
	City Funded	NIC - Spectator Heating Electrification Study	N	$3,100	2024	S	N/A	N/A	N/A	IP
	City Funded+ BC Hydro	FS 4 - Interior Lighting Upgrade	Y	$55,600	2023	D & C	25,000	N/A	0.28	IP
	City Funded	OWCC - Interior Lighting Upgrade - remaining areas	Y	$278,600	2023	D & C	35,000	N/A	0.41	C
	City & FCM Grant	Building Portfolio GHG Pathways to Net-zero Study (NAC) incl. E.E. Measures	Y	$31,250	2023	S	N/A	N/A	N/A	IP
	City & FCM Grant	Building Portfolio GHG Pathways to Net-zero Study (CMA) incl. EE Measures	Y	$31,250	2023	S	N/A	N/A	N/A	IP
	City & FCM Grant	Building Portfolio GHG Pathways to Net-zero Study (FCA) incl. EE Measures	Y	$31,250	2023	S	N/A	N/A	N/A	IP
	City & FCM Grant	Building Portfolio GHG Pathways to Net-zero Study (Beban SC) incl. EE Measures	Y	$31,250	2023	S	N/A	N/A	N/A	IP
	City & FCM Grant	Building Portfolio GHG Pathways to Net-zero Study (NIC) incl. EE Measures	Y	$31,250	2023	S	N/A	N/A	N/A	IP
	City & FCM Grant	Building Portfolio GHG Pathways to Net-zero Study (Bowen Main + Kin Pool) incl. EE Measures	Y	$31,250	2023	S	N/A	N/A	N/A	IP
	City & FCM Grant	Building Portfolio GHG Pathways to Net-zero Study (OWCC) incl. EE Measures	Y	$31,250	2023	S	N/A	N/A	N/A	IP
	City & FCM Grant	Building Portfolio GHG Pathways to Net-zero Study (VICC) incl. EE Measures	Y	$31,250	2023	S	N/A	N/A	N/A	IP
	City Funded	CMA - Interior Lighting Upgrade	Y	$162,300	2020	D & C	73,000	N/A	0.6	C
	BC Hydro	Lighting Study (Park Ops)	Y	$3,000	2024	S	N/A	N/A	N/A	IP

2023- 2030 Projects				Activity: D = Design C = Construction S = Study N = Nominal N/A = Not Applicable/Available TBD = To Be Determined						Status C = complete IP = in progress
City Budget Year (Jan-Dec)	Program Type	Location & Project Description	In Cap. Plan?	Estimated Project Cost	Year Costed	Activity Type	Saved kWh/yr	Saved GJ/yr	Saved tCO2e/yr	-
2024 Cont.	BC Hydro	Lighting Study (FS#7)	Y	$1,800	2024	S	N/A	N/A	N/A	IP
	BC Hydro	Lighting Study (Beban Centennial)	Y	$3,000	2024	S	N/A	N/A	N/A	IP
	City Funded	BP Kin Pool - Boiler Electrification Options	N	$4,100	2024	S	N/A	N/A	N/A	IP
	City Funded	BP Kin Pool - Replace Boiler	Y	$15,300	2019	D	N/A	N/A	N/A	N/A
	City Funded + Clean BC	NAC - Replace RTU #6 (Fitness Gym), #8 (Physiotherapy office) and MUA #1 (Basement Mech. Space)	Y	239,766	2023	C	-38,495	631	51.73	C
	City Funded	NAC - Convert from U.V. pool water treatment to Wapotech (Phase-1)	Y	$124,000	2024	C	200,000	N/A	N	IP
	City Funded	CMA - Replace 2 Natural Gas Furnaces	Y	$67,500	2023	C	-40,053	144	7	C
2024 Total				**$1,475,516**			**254,452**	**775**	**60**	

Table 3: Multi-Year Action Plan - Project List										
2023- 2030 Projects				Activity: D = Design C = Construction S = Study N = Nominal N/A = Not Applicable/Available TBD = To Be Determined						Status C = complete IP = in progress
City Budget Year (Jan-Dec)	Program Type	Location & Project Description	In Cap. Plan?	Estimated Project Cost	Year Costed	Activity Type	Saved kWh/yr	Saved GJ/yr	Saved tCO2e/yr	-
2025 - Tentative Projects	City Funded	CH - Interior Lighting Upgrade	Y	$87,900	2024	C	18,024	N/A	0.2	N/A
	City Funded	25 Victoria - Renew Critical systems	Y	$50,000	2023	D & S	TBD	TBD	TBD	N/A
	City Funded	Beban Pool - Convert from U.V. pool water treatment to Wapotech (Phase-1)	Y	$155,800	2024	C	175,000	N/A	N	N/A
	City Funded	NAC - Add Clarity Controllers to Wapotech to system. Control main pool circulation during non-peak use via VFD's (Phase-2)	Y	TBD	2024	C	TBD	TBD	TBD	N/A
	BC Hydro	PT - HVAC Continuous Optimization Program (COP) Investigation Phase or IEA for building HVAC	N	TBD	2025	D & S	N/A	N/A	N/A	N/A
	CleanBC	PT - Replace two (2) natural gas boilers	N	TBD	N/A	D & S	TBD	TBD	TBD	N/A
	TBD	FCA - Ice Rink Dehumidifier - Electrification Feasibility	N	TBD	2025	S	N/A	N/A	N/A	N/A
	TBD	CMA - Ice Rink Dehumidifier - Electrification Feasibility	N	TBD	2025	S	N/A	N/A	N/A	N/A
	City Funded	CMA - Renew DHW tank	Y	$0	2023	D	N/A	N/A	N/A	N/A
	City Funded	CMA - Investigate options for mechanical conversion to low charge or CO2 with considerations for cooling tower and rink slab replacement.	Y	$7,800	2023	S	N/A	N/A	N/A	N/A
	City Funded	SARC - HVAC Continuous Optimization Program (COP) - Implementation Phase	Y	$151,300	2022	C	TBD	TBD	TBD	N/A
	City Funded	BP Kin Pool - Replace Boiler	Y	$301,200	2019	C	TBD	TBD	TBD	N/A
	City Funded	Public Works Yard Admin + Vehicle Maintenance Building + EV Charging Infrastructure (New Construction) - ON HOLD	N	$90,000,000	2024	C	TBD	TBD	TBD	N/A
	City Funded	PA - 575 Fitzwilliam (RTU 4 and 6)	Y	$86,200	2024	D & S	TBD	TBD	TBD	TBD
	City Funded	PA - 575 Fitzwilliam (RTU 4 and 6)	Y	$86,200	2024	C	TBD	TBD	TBD	N/A
	City Funded	PS - 303 Prideaux (RTU's Qty.5)	Y	TBD	2024	D & S	TBD	TBD	TBD	TBD
	City Funded	PS - 303 Prideaux (RTU's Qty.5)	Y	$150,900	2024	C	TBD	TBD	TBD	N/A

2023- 2030 Projects				Activity: D = Design C = Construction S = Study N = Nominal N/A = Not Applicable/Available TBD = To Be Determined						Status C = complete IP = in progress
City Budget Year (Jan-Dec)	Program Type	Location & Project Description	In Cap. Plan?	Estimated Project Cost	Year Costed	Activity Type	Saved kWh/yr	Saved GJ/yr	Saved tCO2e/yr	-
2025 Cont.	City Funded	NIC - Replace AHU - RTU	Y	$31,800	2024	D & S	N/A	N/A	N/A	N/A
	City Funded	NIC - Investigate options for mechanical conversion to low charge or CO2 with considerations for cooling tower and rink slab replacement.	N	TBD	2025	S	N/A	N/A	N/A	N/A
	City Funded	NIC - Replace dehumidifier	Y	$718,400	2023	C	-53,400	673	33	N/A
		2025 Total		**$91,741,300**			**139,624**	**673**	**33**	

Table 3: Multi-Year Action Plan - Project List										
2023- 2030 Projects				Activity: D = Design C = Construction S = Study N = Nominal N/A = Not Applicable/Available TBD = To Be Determined						Status C = complete IP = in progress
City Budget Year (Jan-Dec)	Program Type	Location & Project Description	In Cap. Plan?	Estimated Project Cost	Year Costed	Activity Type	Saved kWh/yr	Saved GJ/yr	Saved tCO2e/yr	-
2026 - Tentative Projects	City Funded	CMA - Renew DHW tank	Y	$20,800	2023	C	TBD	TBD	TBD	N/A
	City Funded	FCA - Renew all remaining non-LED lighting	Y	$21,800	2020	D	N/A	N/A	N/A	N/A
	City Funded	25 Victoria - Renew Critical systems	Y	$584,300	2023	C	TBD	TBD	TBD	N/A
	City Funded	NAC - Replace AHU #4 - Kitchen/Cafeteria	Y	$6,500	2024	D & S	N/A	N/A	N/A	N/A
	City Funded	NAC - Replace AHU #5 - Kitchen/Cafeteria	Y	$7,200	2024	D	N/A	N/A	N/A	N/A
	City Funded	NAC - Replace AHU#7 - Multipurpose Room A & B	Y	$3,000	2024	D	N/A	N/A	N/A	N/A
	City Funded	NAC - Replace Mua#2 (dry side) akaAhu#3	Y	$6,000	2024	D	N/A	N/A	N/A	N/A
	City and Grant Funded	NAC HVAC Renewal - AHU-1 and AHU-2 with heat recovery chiller & ASHP	Y	5,073,180	2022	C	TBD	18,058	889	N/A
	City Funded	NAC: Natatoriums (wet side) DDC Upgrade	Y	30,000	2020	C	TBD	TBD	TBD	N/A
	TBD	Port Theatre - HVAC Continuous Optimization Program (COP) - Implementation Phase	N	TBD	2025	C	TBD	TBD	TBD	N/A
	City Funded	PoNCP - Renewal of EV charger with SMART unit	Y	$41,600	2024	C	N/A	N/A	N/A	N/A
	City Funded	HP - Replace EV charger with new SMART unit	Y	$41,600	2024	C	N/A	N/A	N/A	N/A
	City Funded	PT - Replace two (2) natural gas boilers	Y	$130,000	2020	C	TBD	TBD	TBD	N/A
	CleanBC	PA - 575 Fitzwilliam (RTU 3,5,7,8)	Y	TBD	2024	D & S	TBD	TBD	TBD	N/A
	City Funded	PA - 575 Fitzwilliam (RTU 3,5,7,8)	Y	$89,500	2024	C	TBD	TBD	TBD	N/A
	City Funded	PT - Interior Lighting Upgrades - Theatre House Lights	Y	$371,700	2021	C	63,905	N/A	0.73	N/A
	City Funded	Streetlighting - Bulk Buy LED Lighting	N	TBD	TBD	C	TBD	N/A	N	N/A
	City Funded	NIC - Replace AHU - RTU	Y	$629,800	2024	C	TBD	TBD	TBD	N/A

2023- 2030 Projects				Activity: D = Design C = Construction S = Study N = Nominal N/A = Not Applicable/Available TBD = To Be Determined						Status C = complete IP = in progress
City Budget Year (Jan-Dec)	Program Type	Location & Project Description	In Cap. Plan?	Estimated Project Cost	Year Costed	Activity Type	Saved kWh/yr	Saved GJ/yr	Saved tCO2e/yr	-
2026 Cont.	City Funded	NIC - HVAC DDC for ammonia plant	Y	$137,800	2024	C	TBD	TBD	TBD	N/A
	City Funded	NIC - Replace cooling tower	Y	$24,800	2024	D	N/A	N/A	N/A	N/A
	City Funded	NIC - HVAC Continuous Optimization Program (COP) Investigation Phase	N	TBD	2026	S, D	N/A	N/A	N/A	N/A
	City Funded	NIC 1 - Replace 6 natural gas tube heaters	Y	$81,100	2024	C	TBD	TBD	TBD	N/A
	City Funded	NIC 2 - Replace 3 natural gas tube heaters	Y	$40,600	2024	C	TBD	TBD	TBD	N/A
2026 Total				**$7,341,280**			**63,905**	**18,058**	**890**	

Table 3: Multi-Year Action Plan - Project List										
2023- 2030 Projects				Activity: D = Design C = Construction S = Study N = Nominal N/A = Not Applicable/Available TBD = To Be Determined						Status C = complete IP = in progress
City Budget Year (Jan-Dec)	Program Type	Location & Project Description	In Cap. Plan?	Estimated Project Cost	Year Costed	Activity Type	Saved kWh/yr	Saved GJ/yr	Saved tCO2e/yr	-
2027 - Tentative Projects	City Funded	PW - Replace 6 gas radiant heaters in Tire Storage Shop with radiant electric heating panels	Y	$43,800	2024	C	TBD	TBD	TBD	N/A
	City Funded	Merle Logan Field Lighting	Y	$419,000	2022	C	TBD	N/A	N	N/A
	City Funded	PS - Replace domestic hot water tank	Y	$15,500	2024	C	TBD	TBD	TBD	N/A
	City Funded	CMA - Cooling tower replacement	Y	$31,200	2024	D	N/A	N/A	N/A	N/A
	City Funded	NAC - Replace AHU #4 - Kitchen/Cafeteria	Y	$88,000	2024	C	TBD	TBD	TBD	N/A
	City Funded	NAC - Replace AHU #5 - Kitchen/Cafeteria	Y	$106,600	2024	C	TBD	TBD	TBD	N/A
	City Funded	NAC - Replace AHU#7 - Multipurpose Room A & B	Y	$112,100	2024	C	TBD	TBD	TBD	N/A
	City Funded	NAC - Replace Mua#2 (dry side) akaAhu#3	Y	$108,000	2024	C	TBD	TBD	TBD	N/A
	City Funded	Beban Pool - DDC Upgrade	Y	$409,000	2020	C	TBD	TBD	TBD	N/A
	City Funded	FCA - renew all remaining non-LED lighting	Y	$307,100	2020	D & C	22,151	N/A	N	N/A
	City Funded	FCA - HVAC DDC	Y	$93,300	2020	C	TBD	TBD	TBD	N/A
	City Funded	OWCC - Replace 13 heat pumps (in ceiling spaces)	Y	$19,800	2020	D	TBD	TBD	TBD	N/A
	City Funded	OWCC -DHW Storage Tanks	Y	$8,100	2020	D	TBD	TBD	TBD	N/A
	City Funded	Streetlighting - Bulk Buy LED Lighting	N	TBD	2027	C	TBD	N/A	N	N/A
	City Funded	NIC - HVAC Continuous Optimization Program (COP) - Implementation Phase	N	TBD	2027	C	TBD	TBD	TBD	N/A
	City Funded	NIC - Replace heat recovery ventilator - Buccaneers Change Room + Admin	Y	$7,000	2020	D	N/A	N/A	N/A	N/A
	City Funded	NIC - Replace Boiler & tank system #1	Y	$8,700	2020	D	N/A	N/A	N/A	N/A
	City Funded	NIC - Replace Boiler & tank system #2	Y	$8,700	2020	D	N/A	N/A	N/A	N/A
	City Funded	NIC - DHW system + HVAC Upgrade	Y	$115,300	2020	C	TBD	TBD	TBD	N/A
	City Funded	NIC - Replace cooling tower	Y	$577,000	2024	C	TBD	TBD	TBD	N/A
2027 Total				**$2,478,200**			**22,151**	**0**	**0**	

Table 3: Multi-Year Action Plan - Project List										
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City Budget Year (Jan-Dec)	Program Type	Location & Project Description	In Cap. Plan?	Estimated Project Cost	Year Costed	Activity Type	Saved kWh/yr	Saved GJ/yr	Saved tCO2e/yr	-
2028 - Tentative Projects	City Funded	Police Ops - Renewal of heat pumps HP-1-02 and HP-1-15	Y	$30,600	2020	C	TBD	TBD	TBD	N/A
	City Funded	PS - Replace air handling unit #1.	Y	$70,300	2020	C	TBD	TBD	TBD	N/A
	City Funded	PS - Replace air handling unit #2.	Y	$94,600	2020	C	TBD	TBD	TBD	N/A
	City Funded	PS - Replace make-up unit #1.	Y	$88,600	2020	C	TBD	TBD	TBD	N/A
	City Funded	PT - Renew lighting with LED in common areas + lobby	Y	$290,000	2024	C	9425	N/A	N	N/A
	City Funded	OWCC - Replace 13 heat pumps (in ceiling spaces)	Y	$182,400	2020	C	TBD	TBD	TBD	N/A
	City Funded	OWCC -DHW Storage Tanks	Y	$37,500	2020	C	TBD	TBD	TBD	N/A
	City Funded	CMA - Rink slab with potential conversion to CO2	Y	$242,200	2023	D	N/A	N/A	N/A	N/A
	City Funded	CMA - Cooling tower replacement	Y	$339,000	2023	C	TBD	TBD	TBD	N/A
	City Funded	CMA - Dehumidifier Replacement	Y	$27,000	2024	D	TBD	TBD	TBD	N/A
	City Funded	BP - Replace AHU #4 (lobby)	Y	$170,700	2024	D & C	TBD	TBD	TBD	N/A
	City Funded	BP - HVAC replace ductless split air conditioner (serves fitness room)	Y	$28,200	2024	C	TBD	TBD	TBD	N/A
	City Funded	PS - Renewal of heat pumps HP-1-02 and HP-1-15	Y	$30,600	2022	C	TBD	TBD	TBD	N/A
	City Funded	NIC - Replace heat recovery ventilator - Buccaneers Change Room + Admin	Y	$28,400	2024	C	TBD	TBD	TBD	N/A
	City Funded	NIC - Replace Boiler & tank system #1	Y	$126,400	2020	C	TBD	TBD	TBD	N/A
	City Funded	NIC - Replace Boiler & tank system #2	Y	$126,400	2020	C	TBD	TBD	TBD	N/A
	City Funded	Nanaimo Curling Club - Replace boilers	Y	$16,600	2020	D	TBD	TBD	TBD	N/A
	City Funded	PT - Interior Lighting Upgrade - Theatre Common Areas	Y	$290,000	2024	C	9400	N/A	N	N/A
		2028 Total		**$2,219,500**			**18,825**	**0**	**0**	

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City Budget Year (Jan-Dec)	Program Type	Location & Project Description	In Cap. Plan?	Estimated Project Cost	Year Costed	Activity Type	Saved kWh/yr	Saved GJ/yr	Saved tCO2e/yr	-
2029 - Tentative Projects	City Funded	SARC - HVAC DDC (not incl. lighting)	Y	$25,000	2028	D	TBD	TBD	TBD	N/A
	City Funded	25 Victoria - Renew lighting with LED	Y	$8,000	2028	D	TBD	TBD	TBD	N/A
	City Funded	Centennial Bldg - Replace natural gas radiant heaters	Y	$25,000	2029	D	TBD	N/A	N/A	N/A
	City Funded	Centennial Bldg - Renew lighting with LEDs	Y	$12,000	2024	D	TBD	TBD	TBD	N/A
	City Funded	Beban Pool - Remainder of lighting (not incl. High bays)	Y	$23,600	2020	D	TBD	TBD	TBD	N/A
	City Funded	CMA - Rink slab with potential conversion to CO2	Y	$244,200	2020	D	TBD	TBD	TBD	N/A
	City Funded	CMA - Dehumidifier Replacement	Y	$462,000	2024	C	TBD	TBD	TBD	N/A
	City Funded	OWCC - Mechanical/HVAC Upgrade	Y	$51,200	2020	D	TBD	TBD	TBD	N/A
	City Funded	OWCC- HVAC Continuous Optimization Program (COP) Investigation Phase	N	TBD	2028	S & D	TBD	TBD	TBD	N/A
	City Funded	OWCC - Replace water cooled heat pump - Unit 301 - Gym 1	Y	$18,500	2020	D	TBD	TBD	TBD	N/A
	City Funded	OWCC - Replace water cooled heat pump - Unit 302 - Gym 2	Y	$18,500	2020	D	TBD	TBD	TBD	N/A
	City Funded	OWCC - Cooling Tower	Y	$34,400	2020	D	TBD	TBD	TBD	N/A
	City Funded	OWCC - Major Mechanical Retrofit	Y	$51,200	2024	D	TBD	TBD	TBD	N/A
	City Funded	PS - 10 heat pumps (HP-1-12, HP-1-13, HP-0-03, HP-2-07, HP-2-11, HP-1-01, HP-1-05B, HP-1-05C, HP-1-05D, HP-1-09)	Y	$17,000	2022	C	N/A	N/A	N/A	N/A
	City Funded	PT - Replace exterior accent lighting	Y	$6,000	2024	D	TBD	N/A	N/A	N/A
	City Funded	VICC - Lighting (Shaw, Kitch, Mech, Conf)	Y	$25,900	2024	D	TBD	TBD	TBD	N/A
	City Funded	PoNCP - Parkade Lighting Renewal	Y	$22,700	2024	D	N/A	N/A	N/A	N/A
	City Funded	VICC - Major Mechanical Hybrid AHU Conversion Partial ASHP)	Y	$100,000	2024	D	132,500	2155	106	N/A
	City Funded	PA - Renew interior and exterior lighting	Y	$159,600	2024	D & C	TBD	N/A	N	N/A
2029 Total				**$1,698,000**			**132,500**	**2,155**	**106**	

Table 3: Multi-Year Action Plan - Project List										
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City Budget Year (Jan-Dec)	Program Type	Location & Project Description	In Cap. Plan?	Estimated Project Cost	Year Costed	Activity Type	Saved kWh/yr	Saved GJ/yr	Saved tCO2e/yr	-
2030 - Tentative Projects	City Funded	25 Victoria - Renew lighting with LED	Y	$132,000	2020	C	TBD	N/A	N	N/A
	City Funded	PT - Replace exterior accent lighting	Y	$109,000	2020	C	TBD	N/A	N	N/A
	City Funded	OWCC- HVAC Continuous Optimization Program (COP) Implementation Phase	N	TBD	TBD	C	TBD	TBD	TBD	N/A
	City Funded	OWCC - Replace water cooled Multistack heat pump - Unit 301 - Gym 1	Y	$238,100	2020	C	TBD	TBD	TBD	N/A
	City Funded	OWCC - Replace water cooled Multistack heat pump - Unit 302 - Gym 2	Y	$238,100	2020	C	TBD	TBD	TBD	N/A
	City Funded	OWCC - Cooling Tower	Y	$375,800	2020	C	TBD	TBD	TBD	N/A
	City Funded	OWCC - Major Mechanical Retrofit	Y	$912,200	2020	C	TBD	TBD	TBD	N/A
	City Funded	HP - Renewal of lighting in the stairs and plaza	Y	$56,000	2020	D & C	TBD	N/A	N	N/A
	City Funded	VICC - Major Mechanical Hybrid AHU Conversion Partial ASHP)	Y	$4,831,700	2024	C	132,500	2155	106	N/A
	City Funded	CMA - Ice Rink Slab Replacement	Y	$2,578,500	2023	C	TBD	N/A	TBD	N/A
	City Funded	SARC - HVAC DDC (not incl. lighting)	Y	$403,000	2020	C	TBD	TBD	TBD	N/A
	City Funded	Beban Pool - Remainder of lighting (not incl. High bays)	Y	$203,500	2020	C	9,800	N/A	N	N/A
	City Funded	SARC - Renew interior and exterior lighting	Y	$25,000	2020	S & D	TBD	N/A	N	N/A
	City Funded	Centennial Bldg - Renew lighting with LEDs	Y	$201,000	2020	C	TBD	N/A	N	N/A
	City Funded	Centennial Bldg - Replace natural gas radiant heaters	Y	$108,000	2020	C	TBD	TBD	TBD	N/A
	City Funded	FS 3 - Replace RTU 1	Y	$83,000	2020	C	TBD	TBD	TBD	N/A
	City Funded	Kin Pool - Replace DHW tank for change and washrooms	Y	$41,000	2020	C	TBD	TBD	TBD	N/A
	City Funded	BPC SC - Chiller #1	Y	$116,100	2020	C	TBD	TBD	TBD	N/A
	City Funded	BPC SC - Chiller #2	Y	$116,100	2020	C	TBD	TBD	TBD	N/A
	City Funded	BPC SC - Chillers Controller	Y	$21,000	2020	C	TBD	TBD	TBD	N/A
	City Funded	BPC SC - Interior/Exterior lighting	Y	$373,900	2020	C	28,780	N/A	N	N/A

2023- 2030 Projects				Activity: D = Design C = Construction S = Study N = Nominal N/A = Not Applicable/Available TBD = To Be Determined						Status C = complete IP = in progress
City Budget Year (Jan-Dec)	Program Type	Location & Project Description	In Cap. Plan?	Estimated Project Cost	Year Costed	Activity Type	Saved kWh/yr	Saved GJ/yr	Saved tCO2e/yr	-
	City Funded	BPC SC - Theatrical lighting	Y	$87,300	2020	C	TBD	N/A	N	N/A
	City Funded	PS - Renew 10 heat pumps, HP-1-12, HP-1-13, HP-0-03, HP-2-07, HP-2-11, HP-1-01, HP-1-05B, HP-1-05C, HP-1-05D and HP-1-09	Y	$317,000	2020	C	N/A	N/A	N/A	N/A
	City Funded	VICC - Lighting (Shaw, Kitch, Mech, Conf)	Y	$626,300	2020	C	90,453	TBD	N/A	N
	City Funded	Museum - Lighting	Y	$61,500	2020	C	10,000	N/A	N/A	N
	City Funded	PoNCP - Replace lighting throughout parkade	Y	$579,300	2020	C	27,999	N/A	N/A	N
	City Funded	HFP - Lighting	Y	$67,300	2020	C	TBD	N/A	N/A	N
	City Funded	BoP - Replace condensing Units 1 & 2	Y	$381,000	2020	C	TBD	TBD	TBD	N/A
	City Funded	BoP - replace AC (Buffalo unit) serving boardroom	Y	$65,000	2020	C	TBD	TBD	TBD	N/A
	City Funded	BoP - replace AHU 1 (RTU services Activity Room 1)	Y	$65,000	2020	C	TBD	TBD	TBD	N/A
	City Funded	BoP - replace AHU 2 (Carrier RTU services main lobby)	Y	$73,000	2020	C	TBD	TBD	TBD	N/A
	City Funded	PY - Renew lighting with LEDs (3 buildings)	Y	$64,000	2020	C	TBD	N/A	N/A	N/A
		2030 Total		**$13,549,700**			**299,532**	**2,155**	**106**	

6.0 Other Professional Services

Knowing the source of the greatest emissions and energy consumption within the organization is key to reducing them. In 2019, the City engaged the services of Prism Utility Monitoring and Analysis (PUMA), to provide internet-based utility monitoring to conduct a pilot program, including access to natural gas and electricity consumption for the 11 sites listed below.

PUMA uses approximately three years of historical billing data from BC Hydro and FortisBC to create baseline modelling dating back to 2016 for:

- Nanaimo Aquatic Centre
- Beban Park Recreation Complex – including Beban Pool, Frank Crane Arena and Beban Social Centre
- Beban Park – including Beban Fieldhouse, Centennial Building and Beban Sports Fields
- Nanaimo Ice Centre
- Cliff McNabb Arena
- Service and Resource Centre
- Port Theatre
- Oliver Woods Community Centre
- Bowen Park – Administration Building and Bowling Club
- City Hall
- Bowen Park – Kin Outdoor Pool

PUMA enables the City to monitor, analyze, track changes, and report energy use and building performance using actual consumption data. This service is very valuable for comparing the performance of building sites, energy use, emissions generated, and operating costs. The data can be regularly reported to Facility Managers using this service. PUMA services are being maintained on a month-by-month basis. The City anticipates conducting a public procurement for continuing and possibly expanding this type of service in 2025.

The City also has 22 buildings currently benchmarked in both the ENERGY STAR Portfolio Manager and Better Buildings BC databases, allowing comparison of metrics against similar categories of facilities.

7.0 Management Approval

By signing below, the City of Nanaimo management acknowledges receipt and approval of this Strategic Energy Management Plan.

Emil Bock
Manager, Corporate Energy

Jennifer McAskill
Manager, Facility Asset Planning

APPROVED
By Mike Bryson at 8:29 am, Jan 24, 2025

Mike Bryson
Deputy Director, Civic Facilities

Poul Rosen
Director, Engineering

Bill Sims
General Manager, Engineering & Public Works

Richard Harding
General Manager, Community Services & Deputy CAO

for Dale Lindsay
Chief Administrative Officer

Appendix A – Site Acronyms[5]

NAC	Nanaimo Aquatic Centre
BPC	Beban Park Complex
NIC	Nanaimo Ice Centre
CMA	Cliff McNabb Arena
OWCC	Oliver Woods Community Centre
BoPC	Bowen Park Complex
BHCBBSP	Beban House, Centennial Building, and Beban Sports Pavilion
PA	Police Annex
PS	Police Station
SARC	Service and Resource Centre
CH	City Hall
CSB	Community Services Building
FHQ	Fire Headquarters
FS1	Fire Station 1
FS2	Fire Station 2
FS3	Fire Station 3
FS4	Fire Station 4
BP	Bastion Parkade
HP	Harbourfront Parkade
PoNCP	Port of Nanaimo Centre Parkade
PW	Public Works
PY	Parks Yard
WTP	Water Treatment Plant
VICC	Vancouver Island Conference Centre
PT	Port Theatre
HAC	Harewood Activity Centre

[5] Acronyms are used in Table 3: Multi-Year Action Plan - Project List

Appendix B – Fleet Renewal

Unit	Fleet Renewal Plan	Planned Replacement Year	Planned Replacement Type
118	VW ID.4	2023	Electric SUV
222	Ford E-Transit Van	2024	Electric Van
233	Ford E-Transit Van	2024	Electric Van
268	Ford E-Transit Van	2024	Electric Van
258	Ford F150 Lightning	2024	Electric Truck
277	Ford F150 Lightning	2024	Electric Truck

Appendix C – Energy Project Investments and Cumulative Savings

Energy Project Investments and Booked Cumulative Savings (Cost Avoidance)[6]														
Year	Calculated Electrical Savings (kWh)	Energy Production (kWh)	Natural Gas (GJ)	Oil (Litres)	GHG (tCO2e)	Projects Electrical Energy Savings $	Energy Production Revenue[7][8] $	Power Factor $	LGS Credits[8] $	MGS Credits[8] $	Natural Gas $	Oil $	Carbon Tax Avoided $	Total Cost Avoidance $
2009	183,092	0	2,578	0	136	11,901	0	6,485	0	0	36,092	0	3,388	57,866
2010	521,875	0	420	4,679	46	33,922	0	957	0	0	5,880	3,509	1,155	45,423
2011	814,468	0	3,984	7,388	242	57,013	0	0	44,980	0	55,776	5,541	6,052	169,362
2012	859,307	0	950	9,083	93	60,151	0	1,724	38,462	0	13,300	6,812	2,329	122,779
2013	347,992	0	327	14,892	67	27,839	0	0	69,600	0	4,578	3,723	1,666	107,406
2014	77,488	511,220	4	1,527	6	6,974	52,704	0	18,291	0	56	1,573	156	27,050
2015	990,063	686,720	2,185	0	133	89,106	74,323	2,240	23,091	27,575	22,943	0	3,330	168,284
2016	261,223	803,440	624	0	38	23,510	86,436	750	44,581	29,617	6,552	0	939	105,949
2017	787,878	880,510	3,250	0	196	70,909	99,149	842	23,337	18,182	34,125	0	5,880	153,275
2018	597,096	801,620	5,929	0	357	53,739	91,458	0	0	0	62,255	0	10,710	126,703
2019	814,089	755,760	450	0	27	73,268	87,797	0	0	0	4,725	0	810	78,803
2020	426,584	698,600	0	0	9	40,525	81,767	0	0	0	0	0	375	40,901
2021	107,732	762,130	0	0	2.1	10,235	87,239	0	0	0	0	0	105	10,340
2022	131,859	729,900	0	0	169.9	15,164	85,102	0	0	0	0	0	11,044	26,207
2023	7,437	749,380	2,145	0	109.2	855	89,424	0	0	0	28,764	0	8,737	38,357
Subtotal[9]	6,928,183	7,379,280	22,846	37,569	1,631	575,111	835,400	12,998	262,341	75,374	275,045	21,159	56,676	1,278,704
Cumula-tive Totals[10]	62,024,395	39,762,260[11]	198,755	412,063	12,029	4,891,532	-	163,412	-	-	2,482,996	196,118	361,668	11,505,619

[6] Does not include incentives received for BCH – EM Agreement
[7] Energy Production Revenue – NOT included in Total Cost Avoided; Energy Production site is at Reservoir No. 1 ERF
[8] Non-cumulative
[9] A summation of the projects in the preceding 15 years
[10] Compound summation of each year including the preceding years' savings
[11] In 2014, the City replaced the open reservoir on Nanaimo Lakes Road with a new reservoir and energy recovery facility. The City generates revenue daily by selling electricity back to BC Hydro as the reservoir fills up with potable water. BC Hydro retains any GHG credits associated with this supply agreement.

Appendix D – Sustainable Building Policy

CITY OF NANAIMO
THE HARBOUR CITY

COUNCIL POLICY

RCRS Secondary:	GOV-02	**Effective Date:**	2024-SEP-23
Policy Number:	COU-229	**Amendment Date/s:**	
Title:	Sustainable Building Policy	**Repeal Date:**	
Department:	Engineering	**Approval Date:**	2024-SEP-23

PURPOSE:

To ensure City facilities are built in an efficient, healthy, and ecologically responsible manner that enhances the well-being of the community in accordance with Council's strategic goals, the Official Community Plan, and community expectations.

DEFINITIONS:

N/A

SCOPE:

This policy applies to:

(a) all new municipal buildings or additions with a gross floor area greater than 250 square meters, or

This policy can inform:

(b) any asset renewals within facilities.

POLICY:

The City of Nanaimo (the "City") is committed to constructing, upgrading, and expanding municipal buildings in a manner than has a positive impact on society and a neutral or reduced impact on the environment, and is in accordance with the City's strategic goals, and community expectations.

The City will strive to ensure the following principles are applied to all required projects in an appropriately scaled manner and considered for all other projects.

As part of this commitment, the design of all new municipal buildings or additions with a gross floor area greater than 250 square meters shall include:

1. Climate risk assessment
2. Life cycle cost analysis for major systems
3. Project summary report including design concepts pertaining to:
    a. Energy and Carbon
    b. Resilient and regenerative ecosystems
    c. Equitable access and mobility
    d. Occupant health and wellbeing
    e. Materials and resources including waste management

4. A requirement for commissioning of the major building systems upon project completion and recommissioning of all commissioned systems one year following project completion

Reporting of projects that fall within this policy will be completed through the statutory Annual Financial Report or other specific reporting as available.

PROCESS:

Numerous proprietary standards exist to encourage more sustainable building construction and operations. To ensure fit-for-purpose, value oriented, sustainable design and construction methodologies, this Policy requires City Staff to consider sustainable and regenerative initiatives appropriate to the scope, form, and character of the project instead of seeking points towards a specific certification.

A companion document is included in Appendix A: *Guidance Document Supporting the Sustainability Policy for City Owned Buildings*, providing additional information and recommended targets for a number of topics falling under the following headings:

a. Energy and Carbon
b. Resilient and regenerative ecosystems
c. Equitable access and mobility
d. Occupant health and wellbeing
e. Materials and resources

1) Responsibilities:

To implement this Policy and maintain continual improvement of the City's sustainability goals, the appropriate governance must be in place throughout the City.

Council is responsible for:

a. Adoption, periodic review, and updating of this Policy
b. Maintaining the necessary corporate capacity to support the elements and practices within this Policy
c. Setting priorities and articulating community values to City administration.

The CAO is responsible for:

a. Implementing this Policy
b. Committing to the implementation and continuous improvement of the sustainability goals as they support achievement of the City's organizational objectives.

2) Benefits of Compliance:

Implementing this Policy will:

a. Support the goals stated in the Official Community Plan,
b. Support the City's vision, community values, and priorities as stated in Council's Strategic Plans, and
c. Support the City's sustainability goals.

3) **Review Date:**
This Policy should be reviewed every 5 years from the effective date or from time to time as substantial advancements in climate science, changes in community priority, National or Provincial codes or updated targets are adopted by the City.

RELATED DOCUMENTS:
N/A

REPEAL or AMENDMENT:
COU-173 Green Building Strategy

Appendix E – Energy Conservation and Management Policy

CITY OF NANAIMO
THE HARBOUR CITY

COUNCIL POLICY

RCRS Secondary:	GOV-02	**Effective Date:**	2009-OCT-19 COUNCIL
Policy Number:	COU-183	**Amendment Date/s:**	2015-OCT-26 COW
Title:	Energy Conservation and Management Policy	**Repeal Date:**	
Department:	Engineering	**Approval Date:**	2009-OCT-19 COUNCIL

PURPOSE:
The reasons for this policy are to:

- become more efficient with energy use;
- reduce waste and greenhouse gas emissions;
- use more environmentally benign sources of heating, cooling, and energy; and,
- reduce pollution.

To reduce energy consumption and lower greenhouse gas emissions, in a manner that is consistent with the:

- City of Nanaimo Corporate Climate Change Plan
- BC Hydro PowerSmart Partner Program Agreement

DEFINITIONS
N/A

SCOPE
N/A

POLICY

1. The City will conserve energy by identifying and adopting, specific, quantifiable targets. The City has set a target of 1% reduction in the City's overall energy consumption per year for existing buildings (as of October 2009). Where growth/expansion of a building area is required, the energy intensity (e.g. kwh/square foot) should not be greater than the energy intensity of existing facilities of similar use.

2. The City's Infrastructure Planning & Energy Manager, in addition to other building, fleet and department managers will be tasked with contributing toward meeting these reduction targets. Energy usage in their respective buildings, facilities, vehicles and operations shall be considered. Opportunities to reduce energy consumption shall be identified.

3. The City will adopt a Fleet Anti-Idling Policy as an air quality and energy conservation measure. The City's Fleet Manager will be responsible for all Anti-Idling training and awareness programs.

4. All non-essential lighting and other electrical loads shall be minimized during non-business hours. Departments are expected to make a reasonable determination as to what critical functions must continue and inform the Building and Department Managers.

5. The City will commit to work with staff to help them better understand energy consumption and the means by which individuals can influence reductions through prudent use of resources. To

help accomplish this, the City may introduce incentives, both fiscal and behavioral, intended to compel staff to use the least amount of energy necessary to achieve personal, professional and operational tasks.

6. The responsibility for "energy efficiency and conservation" will be added to all job descriptions over time.

7. Upgrade existing energy use, mechanical systems, lighting, appliances and other related systems to higher efficiency standards (i.e. Energuide, Energy Star) where the change offers a simple payback of 8 years or less. For buildings, where simple payback is greater than 8 years, a lifecycle cost analysis will be done to determine the advantage of switching to more higher efficient building wide systems.

8. The finance department will report on the corporation's energy consumption and greenhouse gas emissions for each year. All staff will be made aware of their departments energy consumption so that energy efficiency and performance can be assessed and action taken.

9. Building and Department managers shall review, through the budget process, all new energy consuming initiatives – these initiatives will include building and construction projects; as well as programs and/or services provided to the community. Initiatives that ensure that efficient energy use remains a priority will be given preference for adoption.

PROCESS
Delegated to Staff.

RELATED DOCUMENTS
- City of Nanaimo Corporate Climate Change Plan,
- BC Hydro PowerSmart Partner Program Agreement
- Anti-Idling Policy

REPEAL/AMENDS
N/A

Appendix F – BC Hydro SEMP Requirements Form

Key Critical Elements			Location
1.0	EXECUTIVE SUMMARY		
	a.	Energy and GHG Targets (short term/long term)	Executive Summary
	b.	Budget approval for current year plan	Table 3
	c.	Progress to date on long term goal	Executive Summary
2.0	OUR COMMITMENT		
	a.	Alignment with organization's goals	2.2
	b.	Stakeholder Engagement Plan	2.3
3.0	ORGANIZATIONAL ANALYSIS		
	a.	Organizational Profile	3.1
	b.	Stakeholders who need to be involved to be successful	3.2
	c.	Benefits of energy savings (avoided costs, payback, improved comfort)	3.3
	d.	Opportunities/Challenges to be taken into account for energy management plans	3.4
	e.	EMA identified priorities and progress to date on the priorities	4.5; Figure 1
4.0	ENERGY ANALYSIS		
	a.	Year-over-year energy consumption by energy source	Figure 3
	b.	Energy Baseline(s) compared against Energy Performance Indicators	Figure 4
5.0	ACTIONS		
	a.	BEPI of buildings in portfolio	Figure 4; Table 1
	b.	Explanation of strategy for prioritizing projects	6.4
	c.	Current year project list that outlines kWh saved and cost	Table 3
	d.	Budget approval for plan	Table 3
	e.	Potential project outlined for the following 2 years	Table 3
	f.	Low carbon electrification project opportunities	Table 3
	g.	Show how projects contribute to achievements of energy targets	Appendix C
	h.	Progress on EMA items	4.5; Figure 1
7.0	EXECUTIVE SIGN OFF		7.0