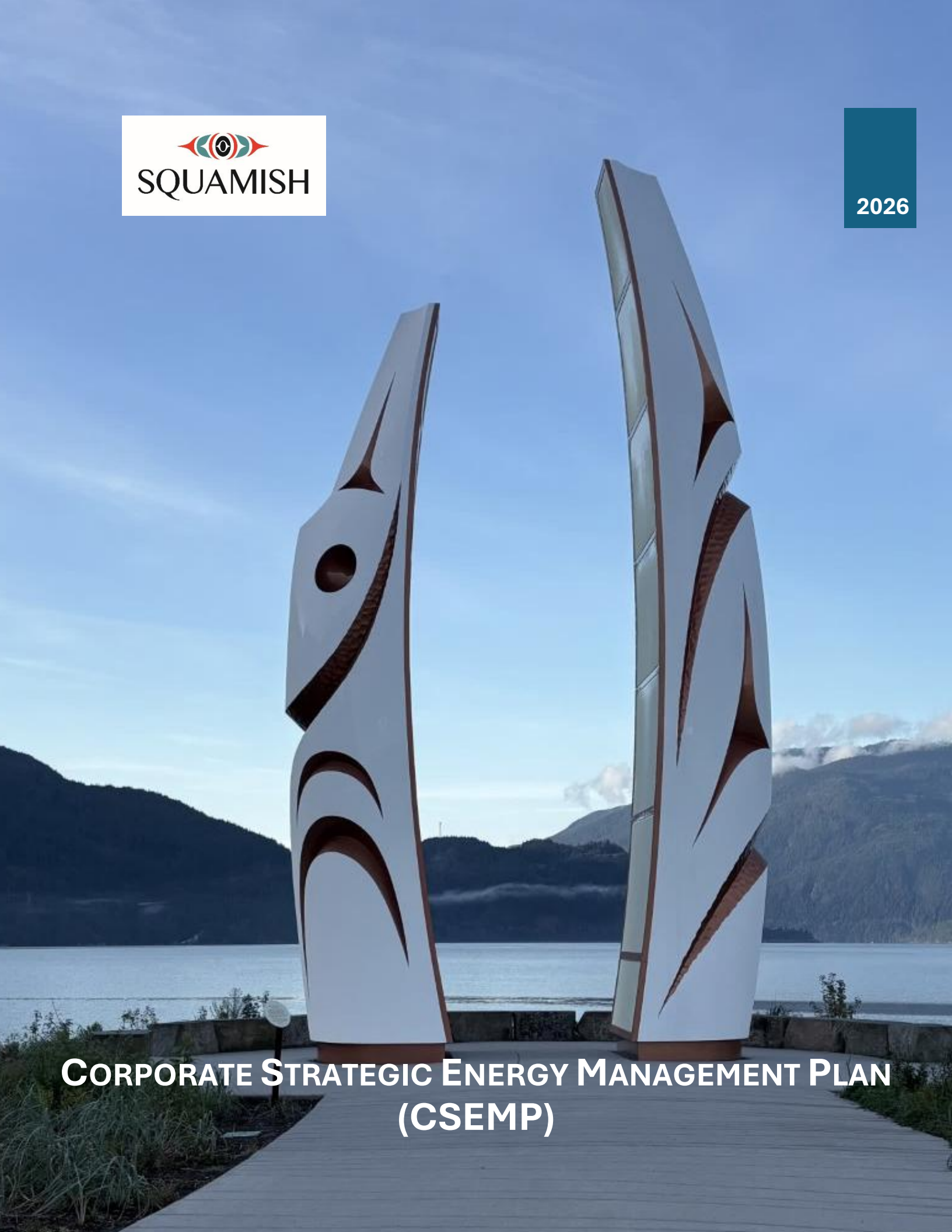

SQUAMISH

2026

CORPORATE STRATEGIC ENERGY MANAGEMENT PLAN (CSEMP)

Executive Summary

The District of Squamish's Corporate Strategic Energy Management Plan (CSEMP) establishes a comprehensive framework to manage corporate energy consumption, reduce greenhouse gas (GHG) emissions and find operating efficiencies across the municipality. Its scope includes corporate buildings, fleet assets, water and wastewater systems, and stormwater infrastructure. The CSEMP does not address community emissions, carbon offsets, and embodied carbon. The Plan seeks to moves beyond a project-based approach by integrating energy efficiency, electrification, and continuous improvement into the District's core business practices.

The strategies in the CSEMP are guided by climate targets laid out in the Council climate emergency declaration, and the resultant Community Climate Action Plan (CCAP) and Municipal Energy and Emissions Plan (MEEP). The Plan is also designed to meet energy efficiency targets established in partnership with the BC Hydro Energy Manager Program (EMP). In 2024, District operations consumed 13,237 MWhe of energy at a total cost of $1.38 million, resulting in 1,124 tonnes of CO_2e emissions. Electricity represented more than 60% of total energy use but only 7% of emissions, reflecting British Columbia's low-carbon electricity supply (Figure 1).

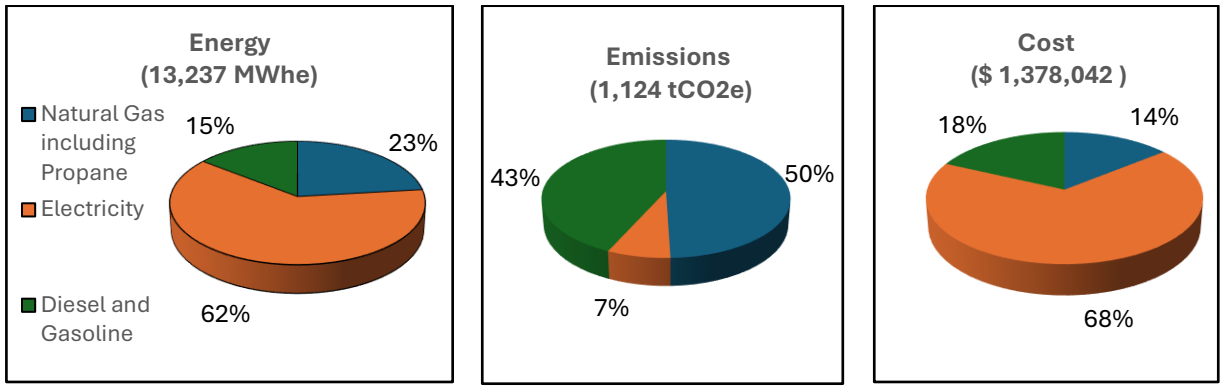

Figure 1: District energy consumption, cost and emissions (2024).

Squamish's recreation facilities (particularly the Brennan Park Recreation Centre) and the corporate fleet are the largest contributors to energy use and emissions, while water, wastewater, and stormwater systems require significant electricity but generate comparatively low emissions. Benchmarking indicates that newer, all-electric facilities, (such as the two recently constructed fire halls) perform substantially better than older buildings. Several legacy facilities - including Brennan Park, the RCMP building, and the Squamish Adventure Centre - present significant opportunities for energy and emissions reductions through targeted retrofits and system upgrades.

To achieve the 2030 emissions reduction target (45% reduction from 2010 levels), the District must reduce corporate emissions by 427 tCO_2e/yr from 2024 levels. Under a business-as-usual scenario, population growth is expected to increase total energy demand and emissions, despite improvements in per-capita performance. Achieving the longer term 2050 target of net-zero emissions will require:

- near-total elimination of fossil fuel use in municipal operations;
- continued investment in energy efficiency;
- electrification of buildings and fleet assets;
- expansion of renewable energy generation; and
- carbon sequestration or offsets for residual emissions.

Major opportunities to reduce energy use and emissions across municipal facilities and infrastructure are summarized in Table 1. This work builds upon many completed studies and projects, including the establishment of renewable electricity generation at Firehall 2.

Table 1: Identified District energy and emissions reduction opportunities

Strategic Area	Opportunities	Energy and Emissions
Building Energy Efficiency	• Lighting retrofits • Envelope upgrades • Continuous optimization	• Reduces 1,453 MWhe /yr • Saves 260 tCO_2e/yr
Fuel switching	• Replace gas fired RTUs with electric	• Increases 1,455 MWhe/yr • Increases 14.5 tCO2e /yr (which is less than gas)
Wastewater Treatment	• Blower replacements • Process improvements	• Reduces 1,093 MWhe/yr • Saves 10.8 tCO_2e/yr
Water System	• Variable Frequency Drives • Optimize pumping systems	• Reduces 150 MWhe/yr • Saves 1.45 tCO_2e/yr
Renewable Energy	• Mashiter Creek Hydropower • Solar PV on corporate buildings	• Creates up to 10,000 MWhe/yr • Saves 99 tCO_2e
Fleet Electrification	• EVs and low carbon fleet vehicles • Install charging infrastructure	• Saves 113,875 L of diesel and 87,173 L of gasoline/yr • Reduces 485 tCO_2e/yr
Total Impact	• Energy reduction: up to 2,696 MWhe/yr • Electricity Generation: Up to 10,000 MWh /yr • Saves 113,875 L of diesel, 87,173 L of gasoline/yr • GHG reduction of 856 tCO_2e	

The Sustainability team will continue to work with Infrastructure Planning, Facilities, Public Works and other departments to identify and refine projects and opportunities to reduce emissions and to meet the BC Hydro EMP reduction targets (i.e., 200kWh in 2025-26 and 600kWh in 2026-27). A multi-year action plan is proposed to reach targets that includes 45 action items (24 near-term and 21 long-term).

Key projects over the next five years include:

- *In progress:* Brennan Park Green and Accessibility Retrofit Project - Ice rink and pool energy recovery (heat exchange), update rooftop units (8x hydronic heat pumps)
  - *251,00 kWh/yr of new electricity use, 5,432 GJ of natural gas savings and 268 tCO2e/yr GHG reduction*
- *In progress:* Brennan Park Retrofit Project- Arena wall and roof Insulation
  - *32,00 kWh/yr electricity savings and 0.3 tCO2e/yr GHG reduction*
- *In progress:* Brennan Park Building enclosure upgrades - External Revitalization
  - *20,000 kWh/yr electricity savings, 1400 GJ of natural gas savings and 70 tCO2e/yr GHG reduction*
- *Proposed:* Brennan Park splash park feasibility study for a solar battery system
  - *90,000 kWh/yr in new electrical generation capacity*
- *Proposed*: Firehall 1 Continuous optimization study
  - *25,826 kWh/yr of electricity savings and 0.4 tCO2e/yr GHG reduction*
- *Proposed*: RCMP Building integrated energy audit
  - *63,056 kWhe/yr electricity savings and 11.5 tCO2e/yr GHG reduction*
- *Proposed*: Fleet Master Plan
  - *Electricity use increases 246,000 kWhe, 159 tCo2e/yr GHG reduction*
- *Proposed*: Squamish Adventure Centre HVAC upgrade
  - *55,556 kWhe/yr of energy savings and 9.9 tCO2e/yr GHG reduction*

Table 2: Benefits of implementing the CSEMP

	*Reduce peak demand by 834 kW*
	*Reduce electricity consumption by 4,048 MWh*
	*Reduce natural gas by 7,389 GJ/Yr*
	*Save up to $ 581,937/yr*
	*Reduce GHG emissions by 567 tCO2e/yr*

There are many potential benefits associated with implementing the CSEMP, as highlighted in Table 2. It is important to monitor progress going forward using existing GHG accounting software, portfolio tools and regular updates to District staff. Key Performance Indicators (KPIs) will be measured to reflect and evaluate progress.

Ongoing communication regarding progress will take the form of webinars, newsletters and Council updates. There are many uncertainties that Squamish will need to account for in implementing the CSEMP, and it will remain a living document. Challenges and opportunities related to electrical upgrades, population growth, increasing use of facilities and buildings, using newer renewable energy technologies, and funding will be continually monitored and adjusted for.

List of Abbreviations

BAU	Business As Usual
BPRC	Brennan Park Recreation Centre
CARIP	Climate Action Revenue Incentive Program
CCAP	Community Climate Action Plan
CEM	Commercial Energy Manager
District	District of Squamish
ESPM	EnergySTAR Portfolio Manager
EUI	Energy Use Intensity
FH1	Firehall #1 (Alex Munro)
GS	General Studies
GHG	Greenhouse Gas
GJ	Giga Joule
GWhe	Giga Watt Hour equivalent (=1000 MWhe)
HVAC	Heating, Ventilation, and Air Conditioning
IPCC	Intergovernmental Panel on Climate Change
km	Kilometer
KPI	Key Performance Indicator
kW	Kilo Watt
kWhe	Kilo Watt Hour equivalent
L/s	Litre/Sec
LED	Light Emitting Diode
LGCAP	Local Government Climate Action Program
MEEP	Municipal Energy and Emission Plan
MH	Municipal Hall
MWhe	Mega Watt Hour equivalent (=1000 kWhe)
NG	Natural Gas
°C	Degree Celsius
OCP	Official Community Plan
PRV	Pressure Reducing Valve
PW	Public Works
RCMP	Royal Canadian Mounted Police
RE	Renewable energy
REFMP	Real Estate Facility Master Plan
SAC	Squamish Adventure Centre
SCADA	Supervisory Control and Data Acquisition.
CSEMP	Corporate Strategic Energy Management Plan
SL	Squamish Library
tCO2e	Tonne of Carbon dioxide equivalent
WWTP	Wastewater Treatment Plan

Contents

List of Tables

List of Figures

1 District of Squamish (District) Commitments

The purpose of the Corporate Strategic Energy Management plan (CSEMP) is to lay out a systematic pathway that enables a municipality to understand and lower energy consumption, reduce corporate greenhouse gas (GHG) emissions and save costs.

The SEMP moves beyond a project-by-project approach toward integrating electrification and energy efficiency into the District of Squamish's overall business strategy. This Plan aligns with emission reduction targets outlined in the 2019 Council climate emergency declaration, the Official Community Plan (OCP), the Community Climate Action Plan (CCAP) and the Municipal Energy and Emissions Plan (MEEP). It also aligns with energy efficiency targets outlined as part of the BC Hydro Energy Manager program. The scope of the SEMP does not include all opportunities for emissions reduction. Notably, community emissions, carbon offsets and embodied carbon are not within its scope.

The CSEMP has been led by a Corporate Energy Specialist (co-funded with BC Hydro as part of the Energy Manager program) and seeks to maximize opportunities for further support with BC Hydro programs. Although this Plan has been finalized in early 2026, it uses 2024 data as that is the most recent complete set of annual data.

Key objectives of the CSEMP

- Develop a structured process to understand, manage and reduce the District's energy consumption and demand over time.
- Identify and implement energy-saving opportunities to reduce the District's energy use and lower emissions.
- Identify and implement electrification (or other low carbon energy) opportunities to lower emissions.
- Foster a culture of continuous improvement: set goals, monitor progress and measure results to ensure energy savings are sustained over time.
- Ensure that energy efficiency efforts are aligned with the District's objectives, policies, and practices, and not treated as isolated projects.
- Develop organizational capacity for energy management in the District.
- Create a Plan to meet BC Hydro's Strategic Energy Management deliverables.
- Align District efforts with opportunities for support and funding, including support available from BC Hydro.

1.1 CSEMP Framework

The Strategic Energy Management (SEM) framework (Figure 2) is a methodology that outlines a structured, continuous-improvement process for a municipality. The process begins with the understanding the District's Plans and Policies (guided by 4 questions), explores implementation, and then considers measurement and adjustment.

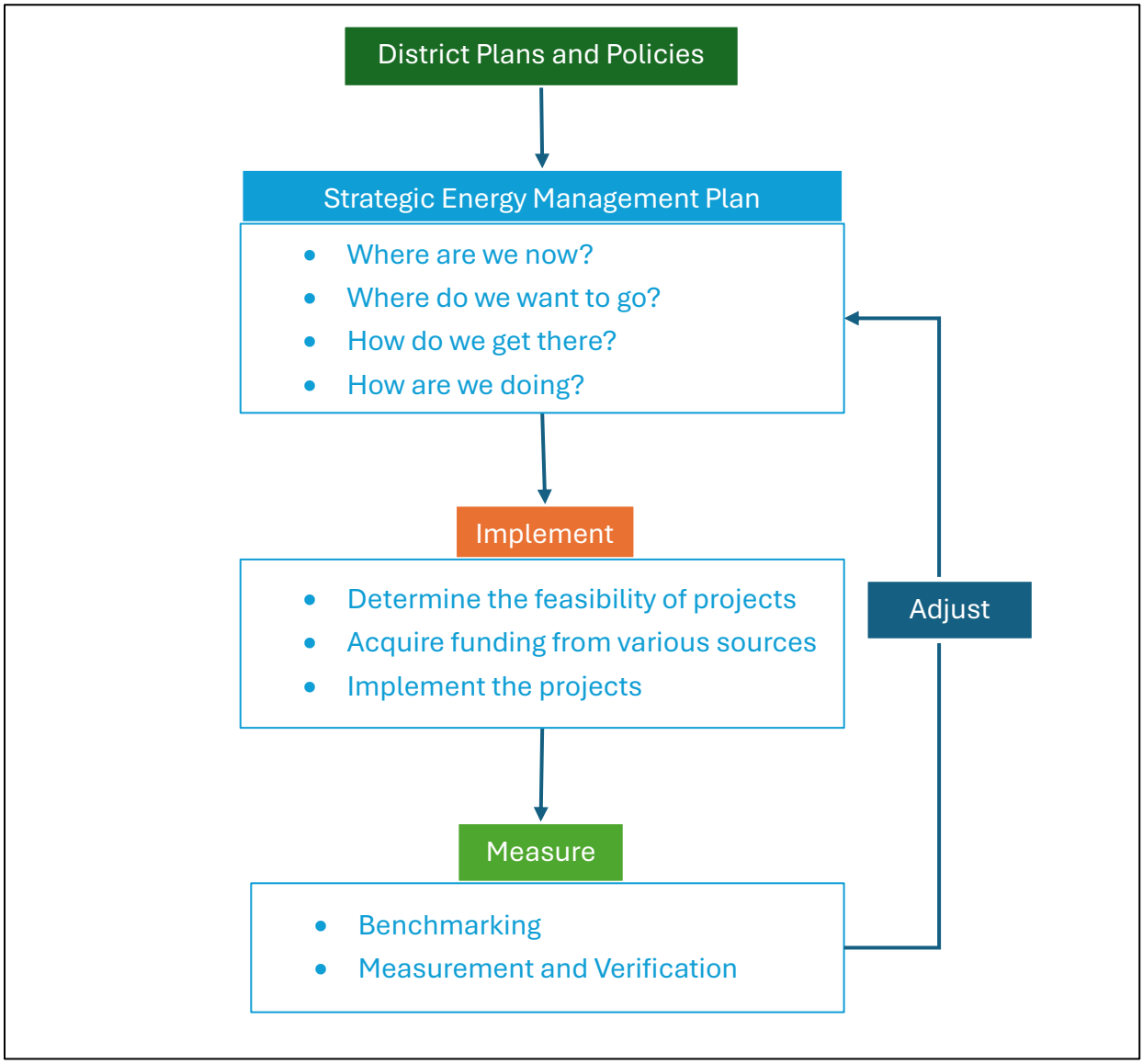

Figure 2: Strategic Energy Management framework (Strathcona County SEMP, 2020).

2 District Plans and Policies

Situated between the City of Vancouver and the Resort Municipality of Whistler, Squamish lies within the traditional territory of the Squamish Nation and within Electoral Area D of the Squamish-Lillooet Regional District. The District encompasses a land area of 105 km^2 and a recorded population of 30,300 in 2024. Squamish is one of the fastest growing municipalities in British Columbia, with a population increase of 52% since 2016. The community has a median age of 37.6 years, one of youngest in the country. Based on the Squamish Population and Housing Projections 2025 report, the population of the District is projected to grow to between 40,100 and 49,000 by 2046.

2.1 Organizational Profile

The District of Squamish owns and operates approximately 20 facilities, a public water supply system, a wastewater transportation and treatment plant, and storm water management stations. The District employees 256 personnel and has a 94 vehicle fleet (see Appendix 2 for the breakdown).

The major municipal facilities and infrastructure included within the scope of the CSEMP is presented in Table 3. Items that are not included are leased properties, contracted services for solid waste management, the landfill and ongoing construction projects.

Table 3: Scope of the CSEMP.

Departments	Facilities/Infrastructures
Recreation	Brennan Park Recreation Centre
Public Works Yard	Wastewater Treatment Plant, Public Work Office, Fleet workshop
Fleet	All vehicles
Water Management	4 pump stations, 35 Pressure Reducing Valves (PRVs)
Waste Water Management	22 Lift Stations
Community Buildings	RCMP Building, Squamish Library
Administration Buildings	Municipal Hall, Engineering Trailer, IT Trailer, Squamish Adventure Centre
Fire Department	Firehall # 1 and 2 Buildings. (Fire response apparatus included in fleet)
Arts & Culture	Art Council Building
Storm Water Drainage Pumps	5 Pumping Stations

2.2 Organizational alignment

The District of Squamish has been taking municipal action on climate change for over a decade and has been carbon neutral in its corporate activities since 2015, as part of its

involvement with the **BC Climate Action Charter**. Since 2014, the District has been reporting corporate carbon emissions from its traditional services[1] to the province—initially through the Climate Action Incentive Program (CARIP) until 2019, and subsequently via the Local Government Climate Action Program (LGCAP) from 2020 onward. The province provides 100% grants, allocated pro-rata based on municipal population. The District uses these funds for many initiatives, including supporting the community and corporate energy positions.

The District of Squamish has multiple plans and policies that guide its efforts toward addressing climate change. The Squamish2040 Official Community Plan (OCP), completed in 2017, is an overarching guiding document for Squamish. It provides direction for development in the community over time and emphasizes the importance of balancing environment, human health, and inclusion in community development. This long-range Plan has a significant climate lens, and envisions Squamish as a leader sustaining ecological and human health while supporting resilient neighbourhoods and a thriving, diverse economy.

In July 2019, the District of Squamish passed a **Climate Emergency Resolution**. The resolution paved the pathway for the development of a climate action plan that is in line with the long-term goal of limiting global warming to 1.5°C as per the 2018 IPCC report. The climate emergency declaration led to the creation of the Sustainability Department, the **Community Climate Action Plan (CCAP)** and the **Municipal Energy and Emissions Plan** (MEEP). More information on these Plans is outlined in sections 2.2.1 and 2.2.2.

In early 2025 the District entered a partnership with BC Hydro as part of the Energy Manager Program. This partnership led to the creation of a co-funded Corporate Energy Manager position for two years, with possibility of renewal. Targets were established as part of the program (see section 2.2.3).

2.2.1 Community Climate Action Plan (CCAP)

The CCAP, initially adopted by Squamish Mayor and Council in 2020, lays out a pathway to reduce community GHGs in Squamish by 45% in 2030 (from a 2010 baseline) and toward achieving net-zero emissions by 2050. The CCAP was updated in 2025 and includes a stronger focus on co-benefits of climate action and new sections on renewable energy and embodied carbon. The 2022 inventory (most recent complete dataset for the 2025 plan) indicates that total emissions for 2022 were 131,000 tonnes. Mobility fuels account for

[1] This involves reporting on GHG emissions associated with the delivery of traditional services, including: Fire protection, Solid waste management, Recreational and cultural services, Road and traffic operations, Water and wastewater management and Government administration

63% of GHGs, electricity and natural gas (NG) for building account for 26% of emissions, and waste contributes 11%. Its Strategies and Actions are organized into 6 major Big Moves, to achieve the community's GHG reduction targets (Table 4):

Table 4: The CCAP 6 Big Moves.

Big Move	2050 Vision
#1: Close the loop on waste	Our community diverts all organics and recovers value from waste.
#2: Shift Beyond the Car	Active transportation and transit are preferred modes of travel to and within Squamish.
#3: Decarbonize Transportation	Electric (or low carbon) cars, buses, fleets and larger vehicles are the preferred option.
#4: Decarbonize Existing Buildings	Energy retrofits occur in all types of buildings in Squamish.
#5: Construct better buildings	New buildings are efficient, use low-carbon energy sources and have lower embodied emissions.
#6: Organizational Leadership	Squamish continues to learn, improve and prepare for a low-carbon future.

2.2.2 Municipal Energy and Emissions Plan (MEEP)

The MEEP (adopted in 2021) is a targeted plan to reduce Squamish's municipal (corporate) greenhouse gas (GHG) emissions by 45% from 2010 levels by 2030, and ultimately reaching net-zero by 2050. The 2030 emissions target is 730 tCO_2e/year, which is a 68% reduction versus business as usual. The MEEP aligns with the broader CCAP but focuses specifically on municipal operations.

Figure 3 highlights key short and long-term strategy to reduce District emissions, including retrofitting existing buildings (particularly the Brennan Park Recreation Centre) constructing new all-electric facilities to Net-Zero Energy Ready standards, and electrifying the municipal fleet and waste collection services. The longer-term strategies beyond direct operations, such as carbon sequestration through land conservation and reducing embodied carbon in construction materials. Together, these approaches support closing remaining emissions gaps while providing broader long environmental benefits. While these measures offer significant emissions reductions, they also involve financial, technical, and infrastructure challenges.

The MEEP is scheduled to be updated in 2026 to align with the updated CCAP and the CSEMP.

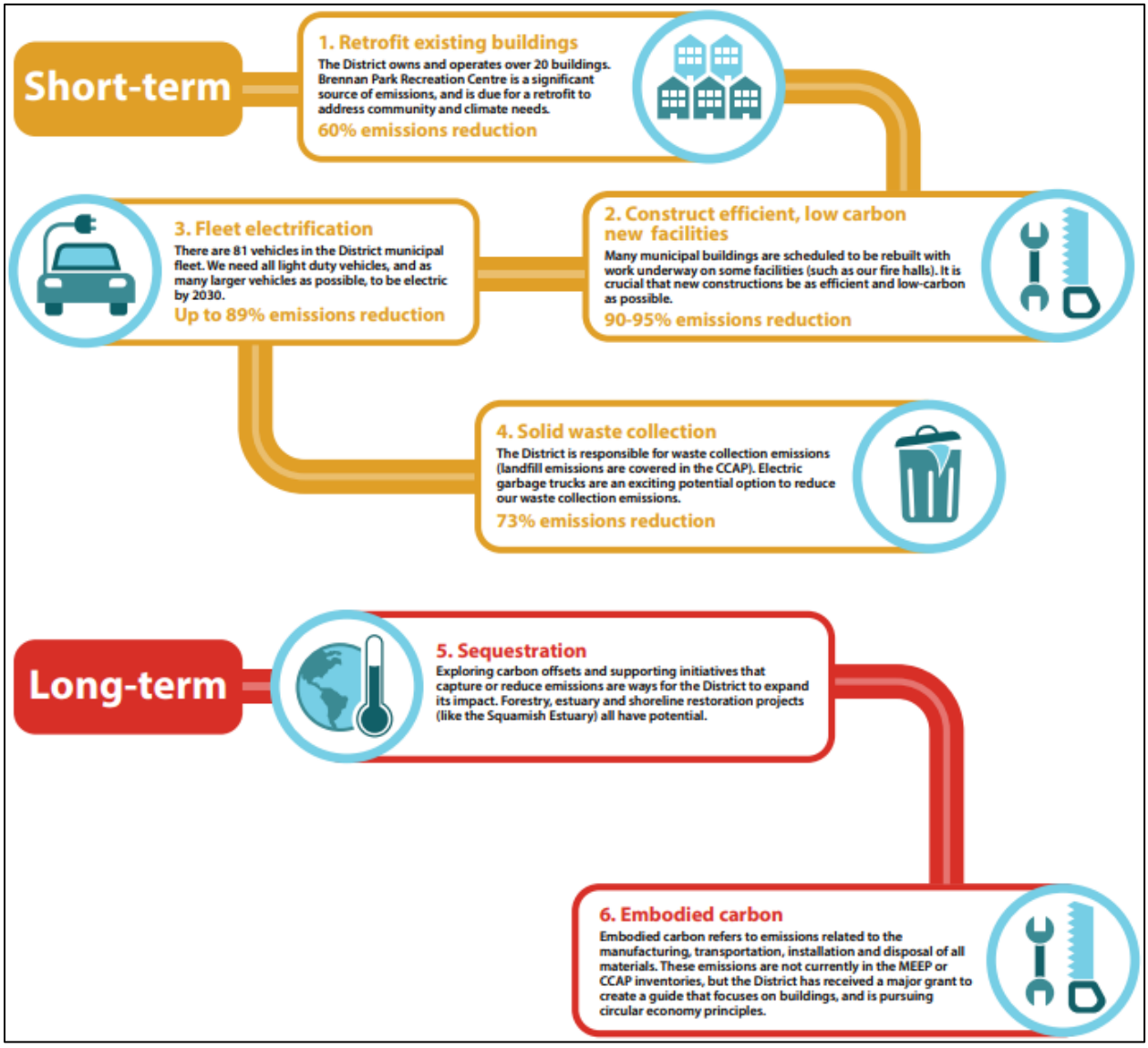

Figure 3: Short and long term action priorities outlined in the MEEP.

2.3 Corporate Energy Management and the Energy Manager Program

The District has been implementing low carbon and energy efficient measures for many years through its Capital projects, Facilities maintenance and Public Works actions. In 2025, the District collaborated with BC Hydro to hire two energy management positions – a Corporate Energy Specialist and Community Energy Coordinator - under the Commercial Energy Manager and Community Energy Manager Programs.

The Corporate Energy Specialist is part of the Sustainability team. The role is multidisciplinary, with responsibilities across Facilities, Public Works, and Infrastructure Planning. Figure 4 shows key energy-related positions that interact regularly with the role.

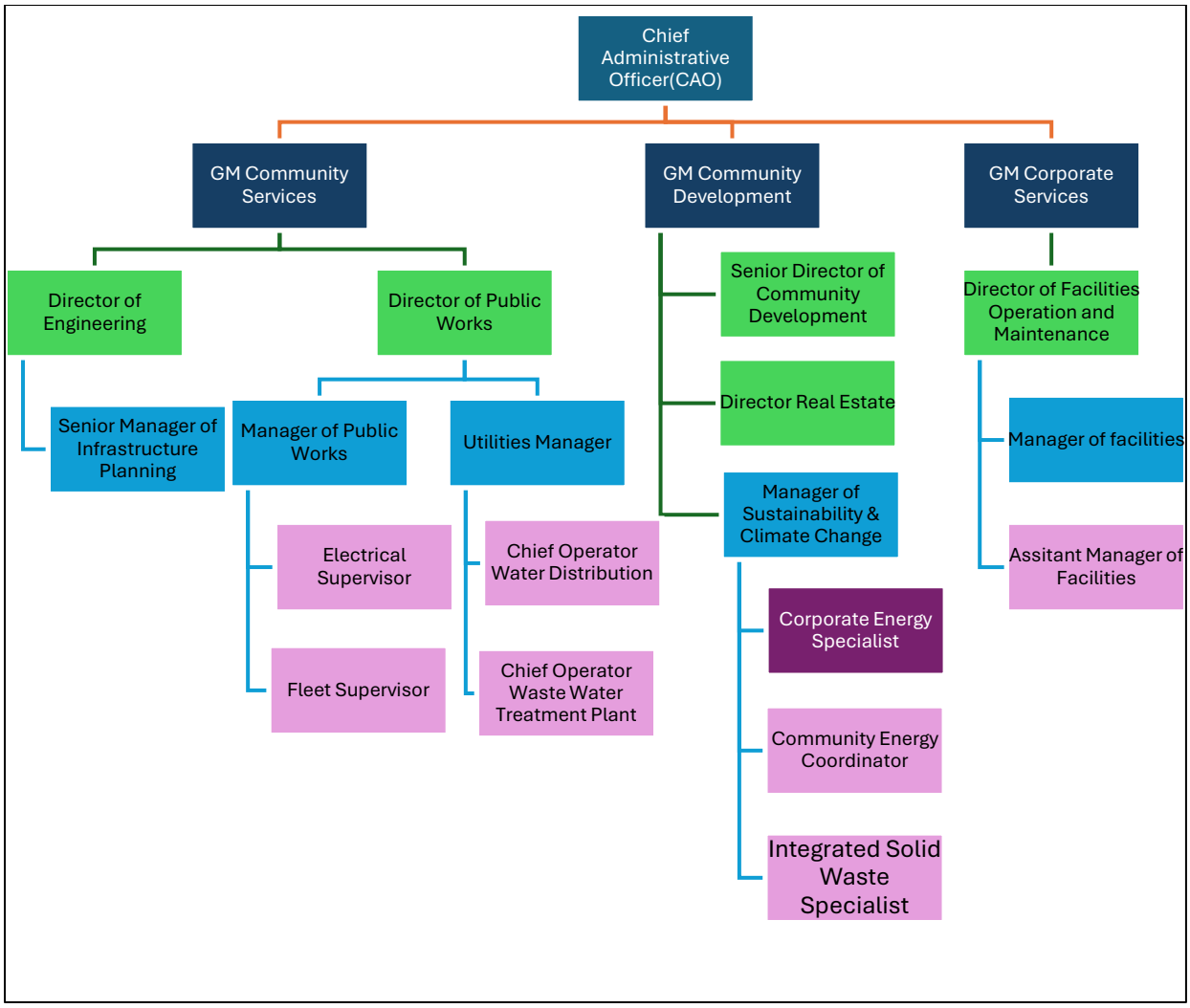

Figure 4: Key energy related positions at the District of Squamish.

Under the Energy Manager Program Agreement, the District committed to undertake many actions, including creating a CSEMP. The performance contract includes the following deliverables:

Year 1 (March 2025 to March 26):

- Perform an Energy Management Assessment
- Create CSEMP
- Report quarterly
- achieve 200,000 kWh in energy efficiency
- Complete 4 studies
- Create an opportunity register for next 2 to 3 years
- Complete Energy Star Portfolio Manager submission
- *Additional bonus deliverables are included*

Year 2 (March 2026 to March 2027)

- Update CSEMP
- Report quarterly
- Achieve 600,000 kWh in energy efficiency
- Complete 2 studies
- Complete Energy Star Portfolio Manager submission
- *Additional bonus deliverables are included*

The District tracks GHG emissions using dedicated GHG accounting software, which enables detailed analysis of energy use and emissions to inform and support climate action policies.

3 District Energy and Emissions Profile

The district consumed 13,237 Megawatt hours equivalent (MWhe) of energy in 2024 which cost $1.378 million and created 1,124 tonnes of CO_2 equivalent (tCO_2e) of GHG emissions. As shown in the Figure 5, electricity is the largest energy source at 8,249 MWhe and the highest cost ($932,069), but the lowest emissions (82 tCO_2e). Natural gas (NG) provides 3,068 MWhe at a lower per unit cost ($195,973) while producing higher emissions (556 tCO_2e). Diesel and gasoline deliver 1,920 MWhe, cost $250,000, and emit 486 tCO_2e. The emissions factors for energy sources are included as Appendix 3. The emissions factor for NG is approximately 18 times electricity in BC, and diesel, gasoline and propane are over 20 times electricity.

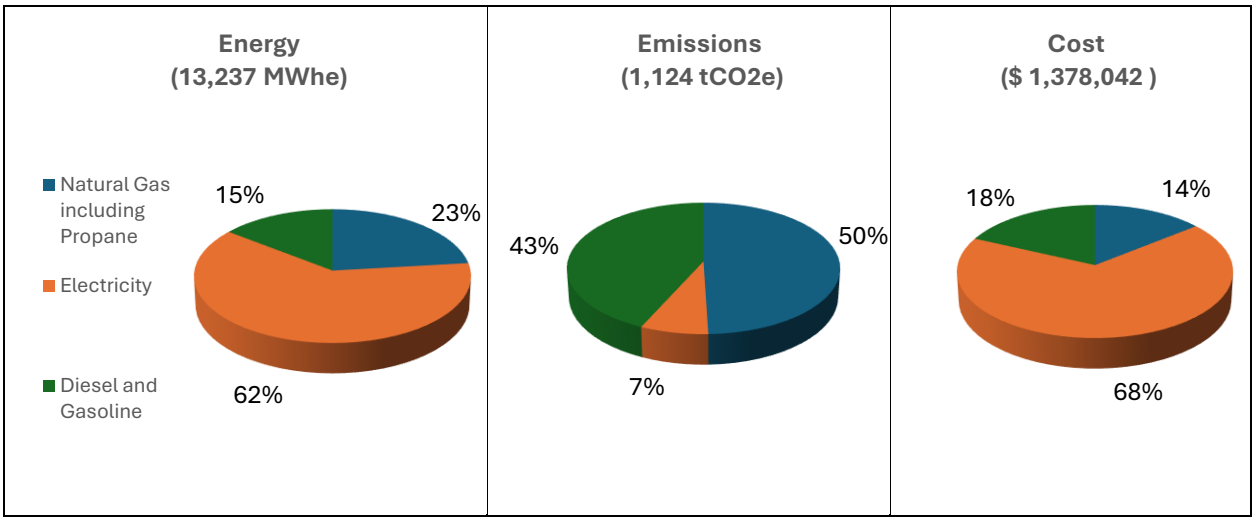

Figure 5: District energy consumption, cost and emissions (2024).

The following subsections outline energy consumption, cost and associated emissions across District operations, and their trends.

3.1 Energy consumption

The historical energy consumption by fuel type of District facilities, equipment and infrastructure is shown in Figure 6. In 2024, the total energy consumed by the District was 13,237 MWhe representing an overall 1.9% reduction compared to 2010.

Electricity and NG accounted for 62.3% (8,249 MWhe) and 22.4% (2,959 MWhe) of total energy use respectively in 2024. Between 2010 and 2024, electricity consumption increased by 2.7% whereas NG consumption decreased by 6.8%. Propane contributed to only 0.8% of total energy consumption (~109 MWhe). The corporate fleet consumed 14.5% of energy use in 2024 (~1,920 MWhe), a 4.7% increase from 2010. The increase in

electricity consumption and the decrease in NG consumption is mostly attributed to recent energy-efficiency projects and electrification initiatives. These are discussed in Appendix 5.

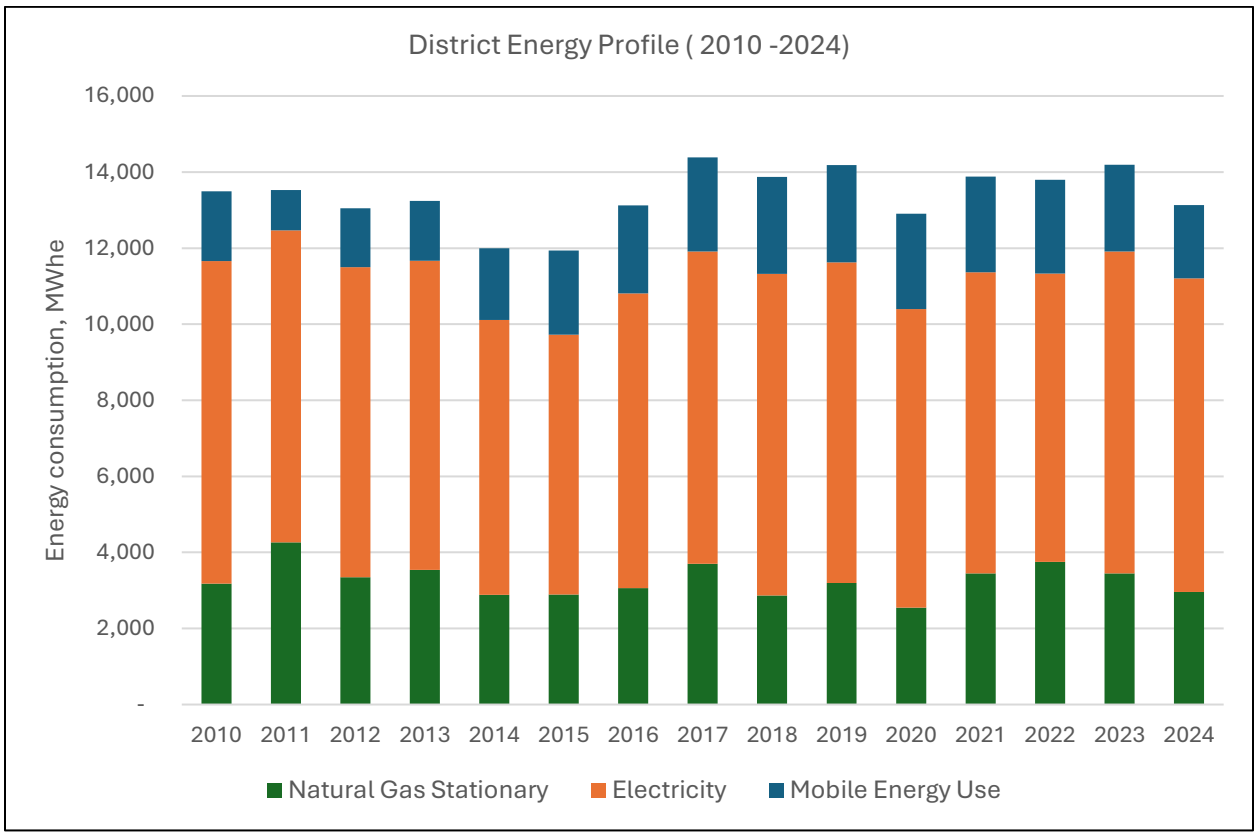

Figure 6: District energy profile by fuel type (2010-2024).

Historical energy consumption trends by department are shown in Figure 7. Some key highlights include:

- Energy use for the administration buildings (i.e., Municipal Hall, the IT trailer and the Engineering trailer) and RCMP building have decreased over time due to lighting upgrades, and Heating, Ventilation, and Air Conditioning (HVAC) retrofit projects.
- Energy use by the fleet and mobile equipment (See Appendix 2 for fleet inventory) increased from 2010-2018 but has decreased since then. This decline is largely due to fleet electrification efforts in recent years.
- Energy use for Water Management, Wastewater Treatment, and Stormwater Management has increased significantly since 2010, driven by population growth.
- Newly built fire halls are electric and consume 41% less energy than in 2010.
- The replacement of streetlights with LEDs has reduced streetlighting energy consumption by 33%.

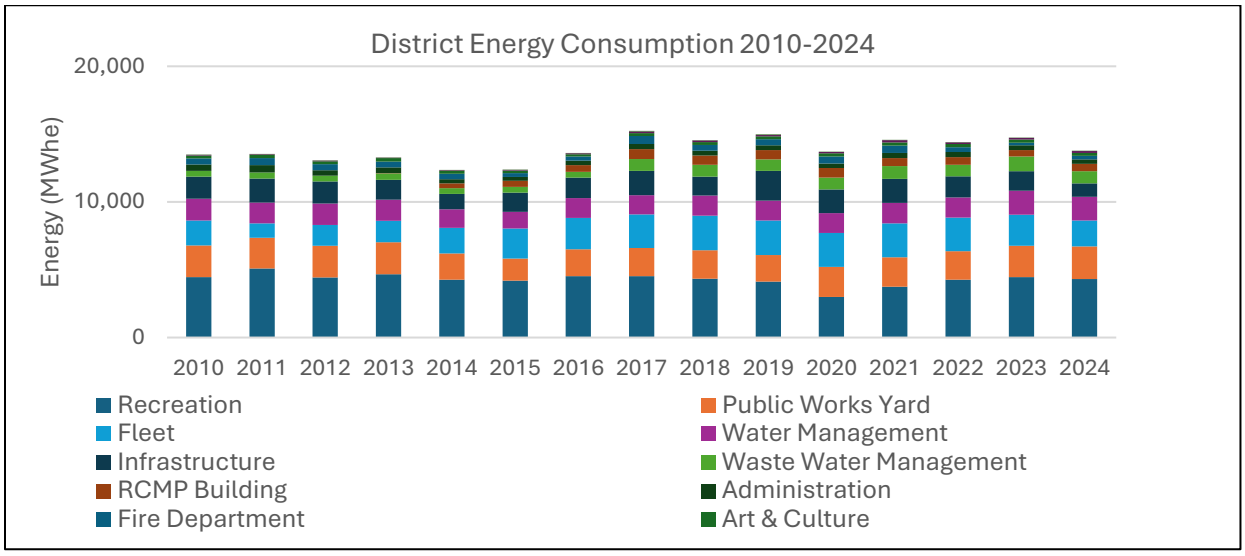

Figure 7: District energy consumption by department (2010-2024).

The breakdown of energy consumption by various department in 2024 is presented in Figure 8. Recreation is the largest contributor to total energy consumption, largely due to the Brennan Park Recreation Centre (BPRC). The department accounted for 31.4% of total energy use. Public Works Yard, Fleet, Water Management, and Infrastructure also represent significant energy-using departments, each contributing 10–20% of total consumption in 2024. Fleet is represented as its own department, but the vehicles are used by other departments (for example Parks uses a significant number of fleet vehicles).

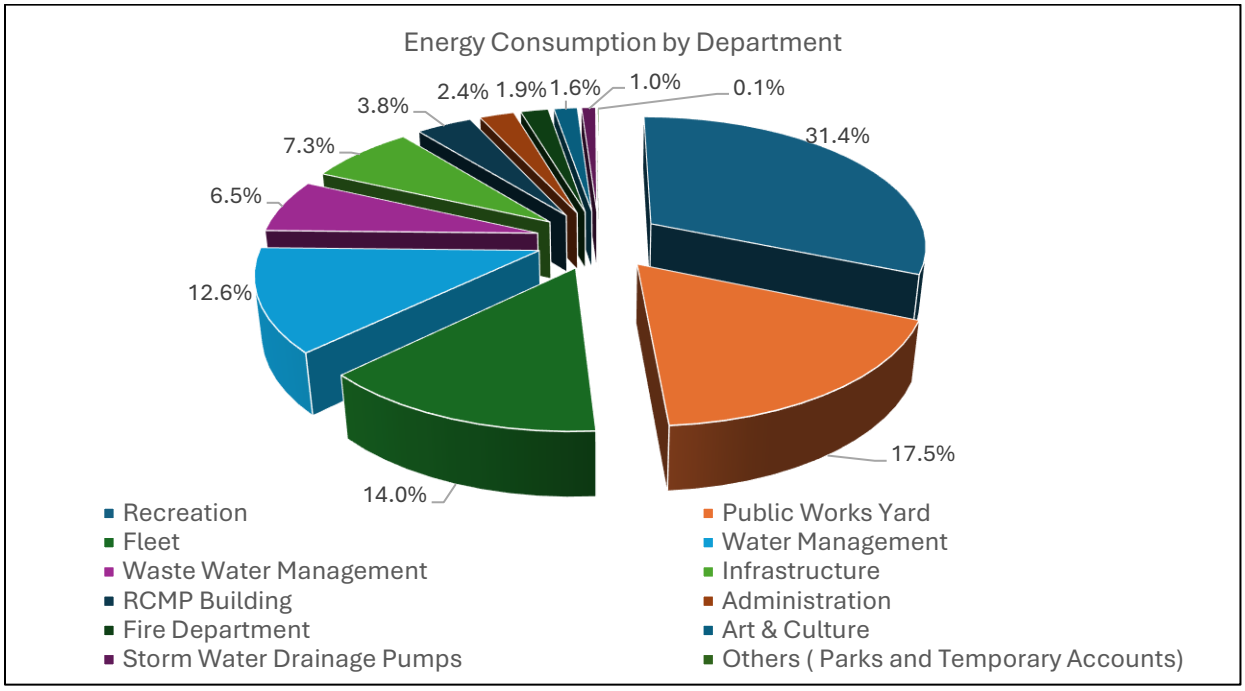

Figure 8: District energy consumption, by department (2024).

3.2 Energy Accounts and Cost

The District consumed a total of 13,237 MWhe energy in 2024. The district paid $1.378 million in total energy costs, 67.6% of which was paid to BC hydro and 11.9% to Fortis BC (see Table 5). The District has 97 active BC Hydro accounts and 15 FortisBC accounts. Costs related to fuel for fleets amounts is estimated to be $250,000 for 113,875 Litre of Diesel and 87,173 Litre Gasoline (~ 1,920 MWhe) and $ 32,436 for Propane (~109 MWhe) in 2024.

The top six utility accounts (combining electricity and NG use) in terms of energy cost are presented in Table 6 . These accounts represent 72% of the total energy cost in 2024. Electricity is the dominant energy source across all accounts, with significant NG consumption at BPRC and the RCMP Building.

Table 5: District energy usage and costs (2024).

	Energy use (MWhe)	Total Cost ($)	Cost ($/kWhe)
Fortis BC (NG)	2959	163,537	0.055
BC Hydro (electricity)	8,24	932,069	0.113
Mobility fuels	1,920	250,000 (Estimated)	0.130
Propane	109	32,436	0.298
Total (with mobility fuels)	**13,237**	**1,378,042**	0.104

Table 6: District's top 6 corporate energy accounts (2024).

BC Hydro Account Number	Account Name	Electricity Cost ($)	NG Cost ($)	Total cost ($)	% Share of 2024 total $
16304110801	Brennan Park Recreation Centre (BPRC) - Recreation	155,532	117,707	273,239	24.9
16304300931	Waste Water Treatment Plant - 39907 Government Road – Public Works Yard	193,175	6,248	199,423	18.2
33170016151	Overhead Street Lights - Infrastructure	127,583	0	127,583	11.6
1552714	Powerhouse springs - Water	99,080	0	99,080	9.0
5058743	RCMP Building - 1000 FINCH DR	37,832	10,894	48,726	4.4
16305241501	Top of the Boulevard Pumping Station - Water	39,215	0	39,215	3.6

3.3 Corporate Emissions

The trends in corporate emissions by fuel type and departments from 2010 to 2024 are presented in Figure 9 and Figure 10 respectively.

Emissions have declined slightly since 2021, following several years of growth between 2015 and 2021. The continued transition to electric fleet vehicles, broader electrification efforts, and the installation of energy-efficient equipment are key drivers of this reduction. It is noteworthy that absolute emissions have decreased modestly even though population has increased substantially over this period. Fossil fuels remain the major contributor to emissions.

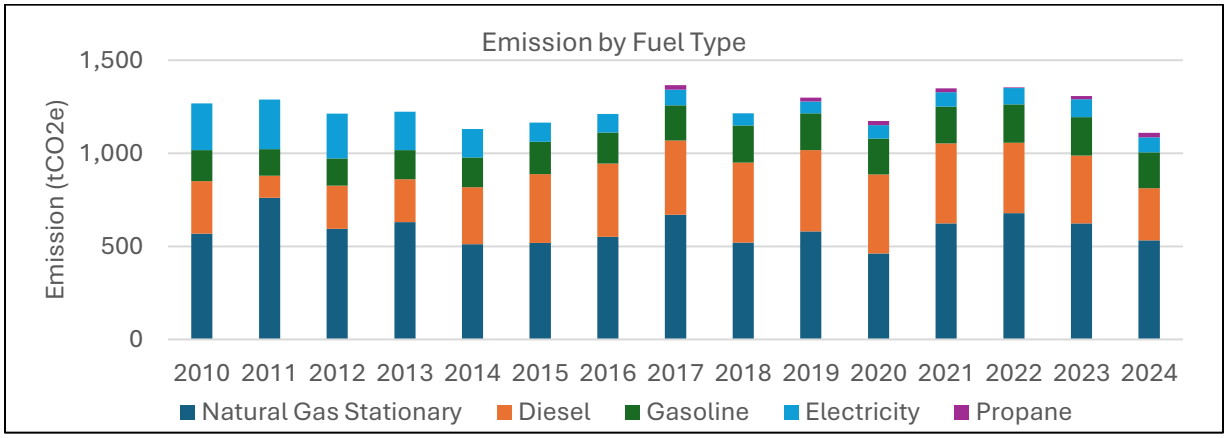

Figure 9: District corporate emissions trend by fuel type (2010-2024).

With regards to the emissions by department (Figure 10), recreation and fleet remain the largest contributors over the years because of the high NG usage for BPRC, diesel and gasoline for fleet vehicles.

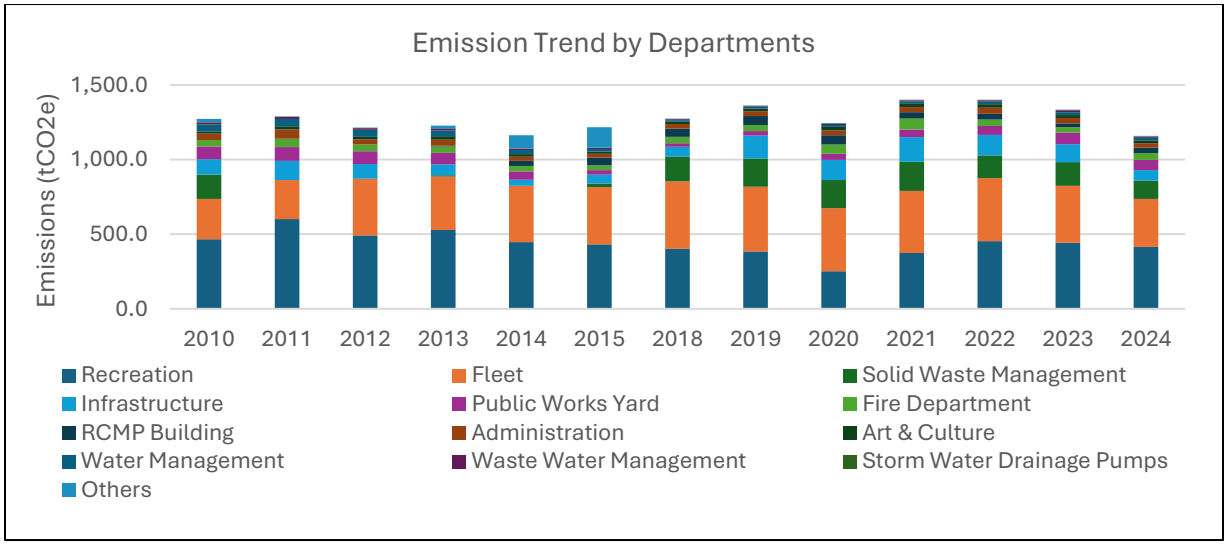

Figure 10: District corporate emissions trend by department (2010-2024)

In 2024, total corporate emissions were 1,124 tCO_2e. Electricity contributed 7% whereas fossil fuel combined contributed 93% to the emissions though the electricity provides 62.3% of the energy consumed by the District's corporate facilities and public infrastructure. This is because BC has a very low emissions factor for electricity, as most electricity is generated from renewable hydro power sources.

The breakdown of 2024 emissions by department is shown in Figure 11. Recreation accounted for nearly one-third of total emissions, largely due to high NG consumption at BPRC. Fleet was the second-largest contributor, responsible for approximately 28% of total emissions. Other major contributors were Solid Waste, Public Works, the Fire Department, and the RCMP building. Water Management, Wastewater Management, and Stormwater Drainage Pumps are among the lowest emission sources despite their substantial energy requirements because they rely on electricity.

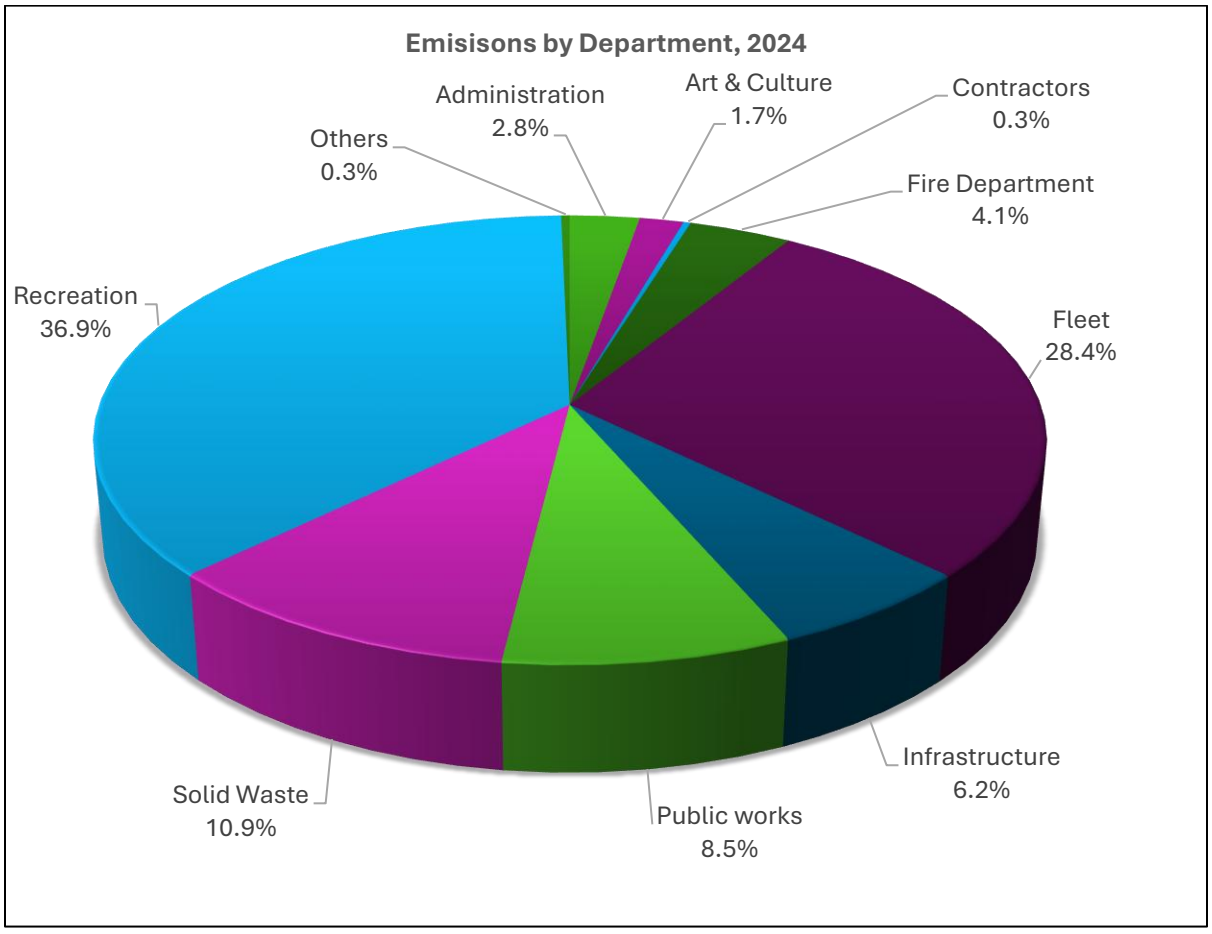

Figure 11: District GHG emissions by department (2024).

3.4 Benchmarking

This section includes energy and performance comparison data (known as benchmarking) for key facilities and systems at the District. Not all sources of corporate emissions are included in this section. Solid waste collection and transportation (outsourced) is not included, nor are leased buildings, which are a relatively minor user of energy

The District operates approximately 20 facilities (see Appendix 1 for the full list), including both owned and leased properties. According to the Real Estate Facilities Strategy and the 2020 Real Estate and Facility Master Plan (REFMP), approximately 75% of district facilities have exceeded their useful life and require replacement. Recommendations from these reports are summarized in Table 7.

Table 7: Summary of recommended actions for District facilities as outlined in the REFMP.

	Facilities	Current State
Replace	• Fire Hall #2 • Fire Hall #1 • Public Works • Municipal Hall • Parks Operations • Brennan Parks – Field User • Library • Fire Hall#3	• Replaced in 2024 • Replaced in 2021 • Ongoing construction • No change[2] • No change • No change • No change • No change
Expansion	• Brennan Park (2nd Ice Rink, 8 Lane pool, Wellness Center, Gym Wellness Center, Parks DT Satellite) • Multi Modal Hub Transit Maintenance • Neighborhood Centers	• HVAC and Building Envelope renovation in progress. No expansion. • No change • No change
Suitable Condition	• RCMP, The 55, Squamish Adventure Centre	• No change
End of Life/Relocation	• Art's Council Building • Youth Centre Drop in Centre • Animal Control	• No change • No change • No change
Non-Operational	• Forestry Building • Cleveland Ave. Restaurant	• No change • No change

[2] No change: There have been no major renovations or modifications completed recently in the building, nor are any planned in the near future.

The REFMP concluded that the two fire halls, Municipal Hall, and the Public Works office are deemed critical and require immediate replacement. To date, two Firehalls have been replaced with new, highly efficient, fully electric buildings, and the Public Works office is currently under construction. HVAC retrofits for Brennan Parks Recreation Centre are scheduled for completion in early 2026, with building envelope upgrades expected to start in 2026.

3.4.1 Energy Performance of Key Facilities

Seven key facilities have been evaluated for energy performance using historical energy consumption trends and Energy Use Intensity (EUI, kWhe/m^2). These were selected because they consume large amounts of energy (see Section 3.1 and 3.2). The result of the evaluation is presented in Figure 12. These facilities include the two fire halls, Squamish Adventure Centre, Brennan Park Recreation Centre, the Administrative buildings RCMP building and the Library. Collectively, these seven buildings accounted for 52% of the District's total energy consumption in 2024, representing 87% of total NG and 39% of total electricity consumption.

The EUI of the key facilities were compared with the median EUIs of the same category in the Energy Star Portfolio Manager (ESPM)[3] and Building Benchmark BC[4] databases. Comparison of 2024 EUI against ESPM median and Building Benchmarking BC minimums (See Figure 12) shows that the Brennan Park Recreation Centre RCMP building and Adventure Centre have higher EUIs than the ESPM median. The two new fire halls are the best-performing facilities, with EUI 77–90% lower than the ESPM median, reflecting their efficient and electrified design.

[3] ESPM is a free online tool developed by the U.S. Environmental Protection Agency and adopted by Natural Resources Canada that allows users to track and assess energy and water use across your entire portfolio of buildings, benchmark and compare its performance to similar buildings in a secure online environment

[4] Building Benchmarking BC is a collaborative initiative launched in 2020 that encourages building owners and managers to disclose their energy performance data. The program aims to enhance energy efficiency, reduce greenhouse gas emissions, and promote transparency in building operations.

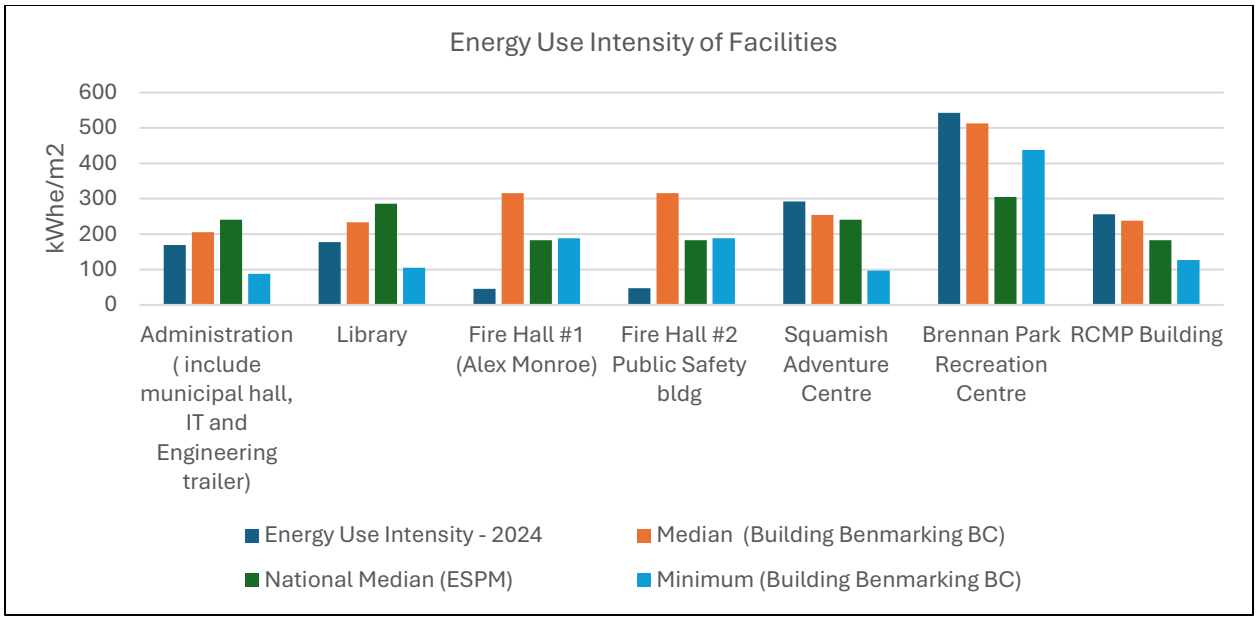

Figure 12: Energy performance evaluation of key District facilities (2024).

3.4.2 Waste Water Treatment System

The wastewater treatment infrastructure for the District comprises a wastewater lifting and transport system, the Mamquam Wastewater Treatment Plant (WWTP), and a public works office building. The District WWTP and Public Works (PW) office buildings are located within the public works yard, so the consumption of the PW office building is included in the analysis.

The District currently owns and operates a sanitary-only sewer collection system which carries only wastewater and does not include stormwater, runoff and other non wastewater sources (which are part of the water management system). The wastewater treatment system treated 3.149 million m^3 of wastewater in 2024. The system includes 25 lift stations that pump wastewater through 13.3 km of Forcemains (pressurized piping systems) to higher elevations, and the Mamquam WWTP where the wastewater is treated and discharged into the environment. The Mamquam WWTP consumed approximately 2,167 MWh of electricity in 2024.

Energy consumption by the wastewater treatment infrastructure and the annual effluent volumes from 2014-2024 are summarized in Figure 13. Energy use intensity and influent volumes have increased modestly since 2014. The influent volume has increased from 2.827 to 3.149 million m^3 in 2024 and the total energy use per unit of influent treated has increased from 0.69 to0.74 kWh/m^3 in 2024 (not including wastewater lift stations). Influent

volumes are primarily driven by population growth and weather events which change the energy consumed for wastewater treatment.

Existing system studies indicate that various factors such as influent Biochemical Oxygen Demand (BOD), presence of trickling filters, temperature, effluent BOD, and nutrient removal processes all affect wastewater treatment efficiency. 0.4 kWh/m^3 is identified as a highly efficient system, and levels up to 1.32 kWh/m^3 in less efficient systems. At 0.74 kWh/m^3 without energy consumed by lift stations, the District system is near the mid-range of typical efficiency.

As population increases, wastewater influent volumes will increase. Based on the current and forecasted treatment volume and energy consumption, there is significant potential to improve energy efficiency within the District wastewater system. Completed studies suggest that energy consumption could potentially be reduced by up to 45%, representing a major opportunity for operational savings and sustainability improvements.

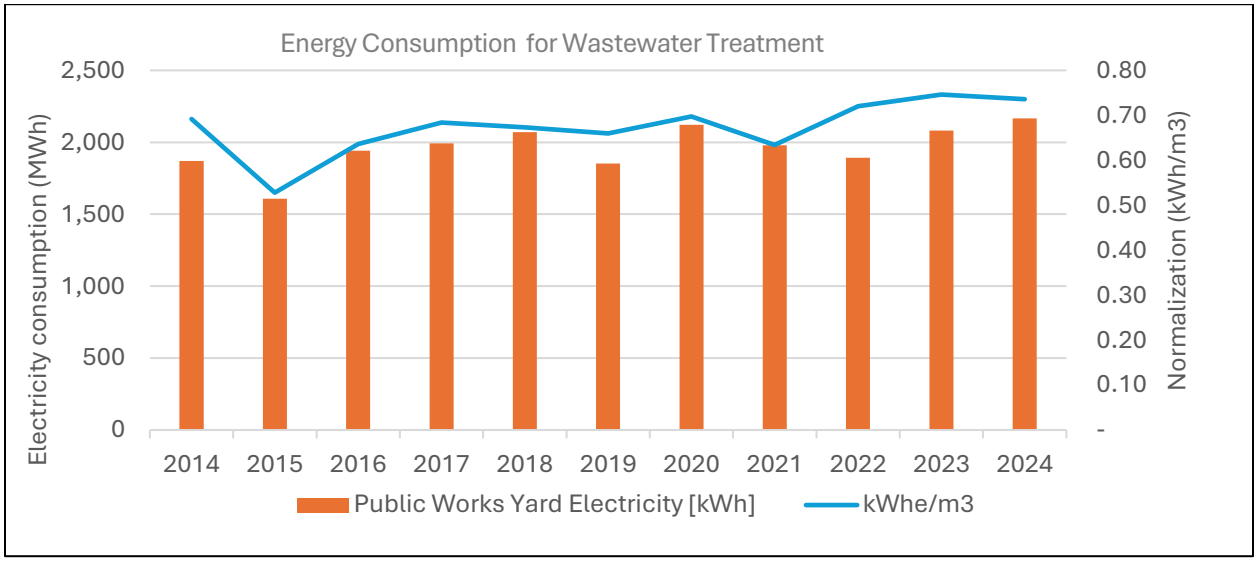

Figure 13: Energy consumed for wastewater transportation and treatment (2014-2024).

3.4.3 Water Management system

As of 2024, the District's water system serves 29,206 residents and delivers more than 4.74 million m^3 of water. The system comprises 4 pump stations, 35 Pressure Reducing Valves (PRVs), and 146 km of watermains. Energy consumption for water delivery currently stands at 1,728 MWh annually, representing a modest increase since 2015 with significant variation between years (See Figure 14). Changes likely reflect population growth and year-to-year weather variability.

If the district's population continues to grow at a 4% compounded annual rate, the population is projected to double by 2041. Assuming the 2023 average daily per capita

demand of 457 litres, the maximum daily water demand is expected to rise from 245 L/s to 479 L/s solely due to population growth. Consequently, water demand - and the associated energy consumption - will likely increase significantly by 2041.

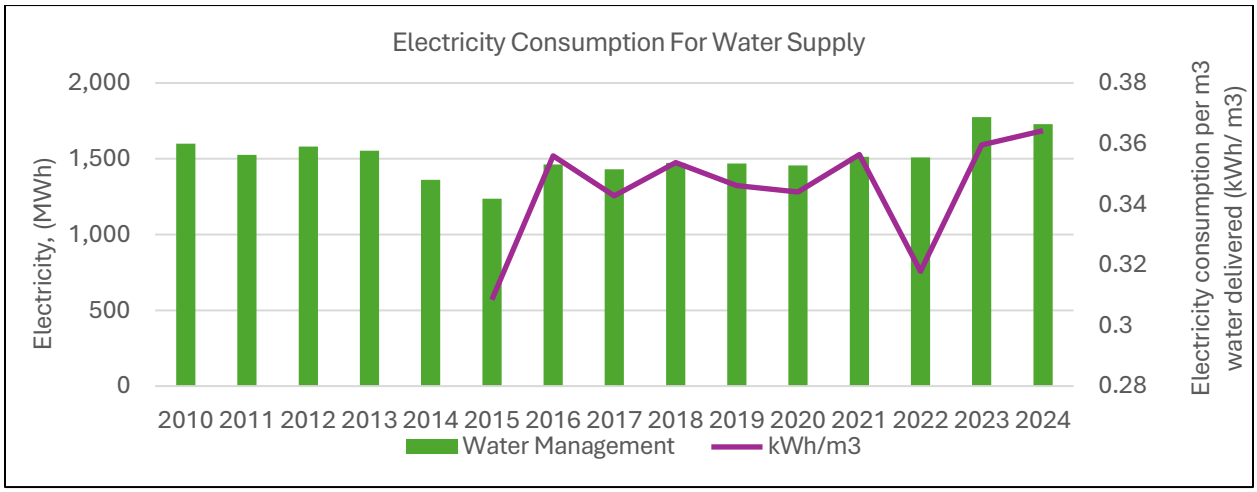

Figure 14: Total electricity consumption and energy intensity of District water collection, treatment and delivery system (2010-2024).

3.4.4 Storm Water Management

Stormwater is managed through five lift stations located in various flood-prone areas of the District. The annual energy consumption for stormwater management is summarized in Figure 15. As shown, energy consumption has steadily increased since 2014. In 2024, the stormwater drainage system consumed 133 MWh of electricity.

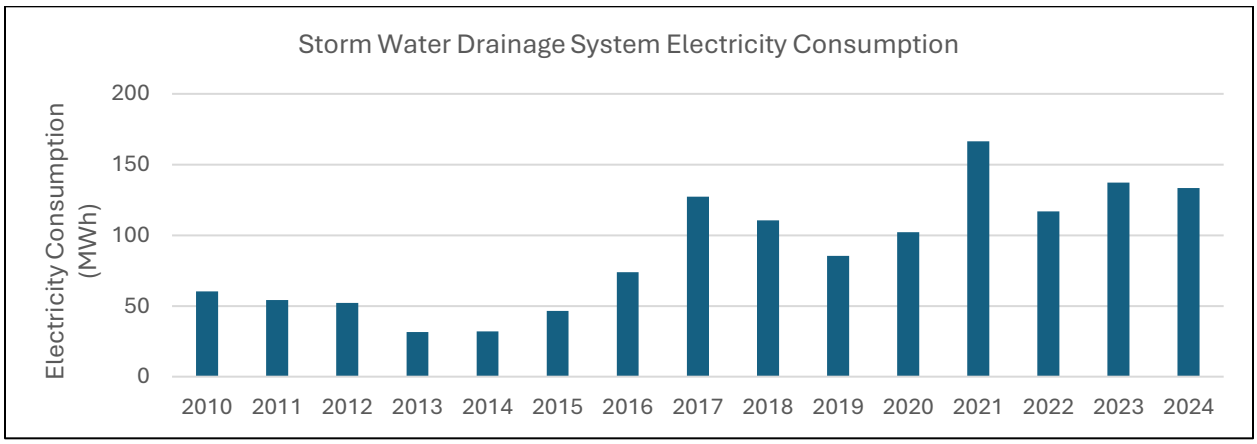

Figure 15: Electricity consumed by District storm water drainage system (2010-2024).

4 Energy and Emission Targets

Based on the climate emergency declaration, OCP and CCAP, the District aims to reduce its GHG emissions by 45% from 2010 levels by 2030 and achieve net-zero emissions by 2050. These targets are absolute, not per capita. The MEEP and the CSEMP represent the District's commitment to align its corporate actions with the short and long-term community emissions reduction targets. For the CSEMP, the District is using emissions reduction as the primary target as it is a key Council strategic. Corporate energy efficiency targets will be met if the District makes meaningful progress toward its GHG reduction commitments.

The annual emissions from 2010 -2024 along with the BAU projection until 2050 and the emissions target set by CCAP is presented in Figure 16. Corporate emissions in 2010 were 1,267 tCO2e and have decreased to 1,124 in 2024. A regression analysis of the current energy consumption and emission with the population projection until 2050 for the district indicates that energy demand for Squamish will grow by 10% to 14.7 GWhe in 2050 BAU case. Electrification will add up to 4 GWhe to the forecasted total electricity consumption for the district's corporate operations. Likewise, the BAU scenario shows a slight increase in emissions, with per capita emissions continuing to decrease but population growth leading to an increase in absolute emissions. The district needs to put forth concerted efforts to achieve the absolute 2030 and 2050 emission targets at a corporate level.

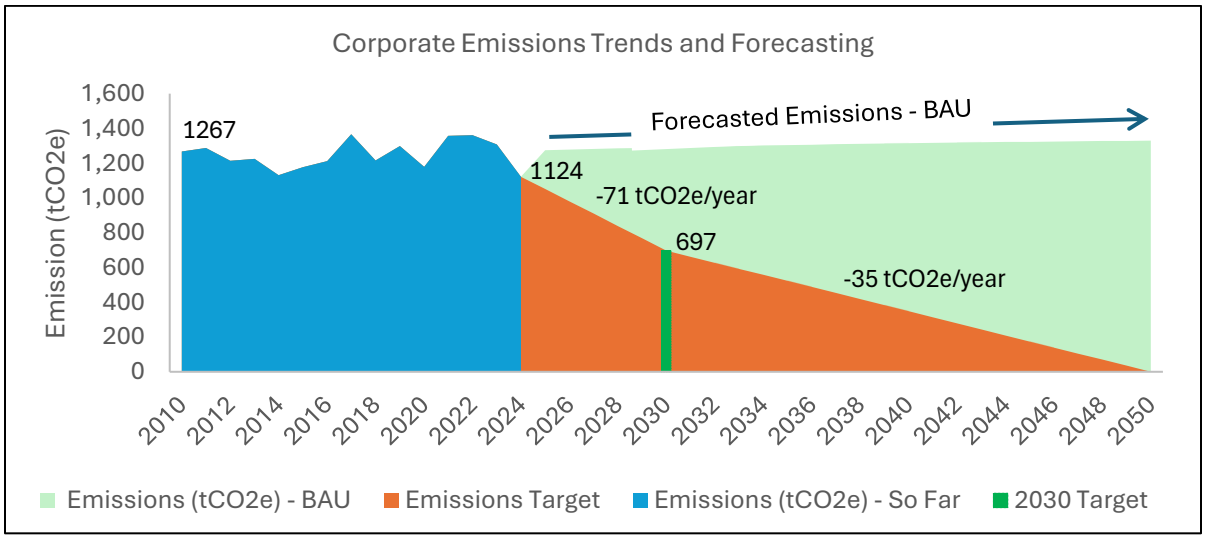

Figure 16: District historical corporate emissions, targets and BAU scenario (2010-2050).

To meet the corporate 2030 target, the District must reduce emissions by a further 427 tCO_2e/yr from 2024 levels, requiring an average annual reduction of 71.3 tCO_2e/yr from 2025 to 2030. Likewise, the District would then need to continue to reduce emission by an average of 35 tCO_2e/yr from 2030-2050 for net zero emission by 2050. Virtually all pathways

to achieve the 2030 and 2050 targets involve significant reductions in district fossil fuel consumption. One pathway is outlined below, and includes the following assumptions:

- A 15% reduction in electricity consumption is possible through energy efficiency.
- All types of fleet vehicles can be electrified or have low carbon options by 2050.
- All buildings can be 100% electrified.
- Renewable energy can offset the increased energy required for electrification, so that total external electricity requirements remain stable.

The pathway to achieve the targets is presented in Figure 17 and Table 8. It requires the District to reduce NG consumption by 4,521 GJ/yr, fleet diesel consumption by 48,055 L/yr, fleet and gasoline consumption by 36,787 L/yr, and electricity consumption by 1,313 MWh/yr by 2030. Electricity consumption will increase by 1,679 MWh/yr as more electrification is required to offset fossil fuel use. As shown in Table 8, this pathway involves both reductions in electricity use through efficiency and increases in electricity use through the electrification of facilities and vehicles.

To achieve net zero emissions by 2050, the district likely needs to eliminate the use of NG, propane, Diesel, and Gasoline for all corporate operations. This means the district must electrify all buildings and its fleet (or pursue other low carbon alternatives) and invest in energy efficiency and renewable energy. These actions must occur in concert with carbon capture and/or sequestration measures to offset residual emissions (e.g., those related to electricity generation). In this pathway the District will increase electricity consumption to approximately 2,176 MWh/yr (see Figure 17). By the end of 2050, electricity consumption will remain at 9,563 MWh/yr assuming District investment in energy efficiency and renewable energy development. Total corporate residual GHG emissions will be 94 tCO_2e/yr by 2050 in the net zero 2050 scenario, which should be able to be readily offset by carbon sequestration and/or carbon capture efforts.

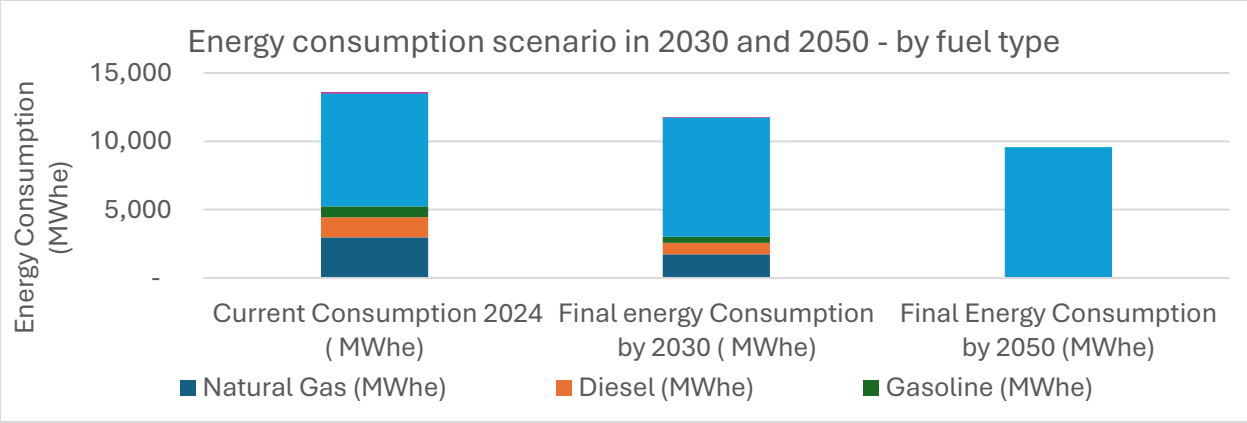

Figure 17: District energy consumption by fuel type in 2024, 2030 and 2050, assuming emissions targets are met.

Table 8: Pathway to meet emissions targets.

	Natural Gas	Diesel	Gasoline	Electricity	Propane	Emissions (tCO2e)
Current (2024) consumption						
Energy Consumption	**10,715 GJ**	**113,875 L**	**87,173 L**	**8,249 MWh**	**15,350 L**	
Emissions (tCO2e) ***(and % of total)***	533 *(47.5%)*	294 *(26.2%)*	192 *(17%)*	82 *(7.2%)*	24 (2.1%)	1,124
2030 Pathway (45% reduction)						
Energy Consumption	6,193 GJ	65,819 L	50,386 L	8691 MWh	8,872 L	
Required energy reduction /increase	4,521GJ	48,055L	36,787 L	1,237 MWh 1679 MWh	6477 L	
Emissions (tCO2e) ***(and % of total)***	308 (45%)	170 (25%)	111 (16%)	86 (12%)	13 (2%)	688
2050 Pathway (net zero)						
Energy Consumption	0	0	0	9,563 MWh	0	
Required energy reduction /increase	6,193 GJ	65,819 L	50,386 L	1,370 MWh 2,176 MWh	8,872 L	
Emissions (tCO2e) ***(and % of total)***	0	0	0	95 (100%)	0	95

As previously noted, this is one pathway: there are many ways to achieve the reduction targets. Chapter 5 will discuss specific actions toward achieving the target, including a strategic multiyear action plan that includes a list of potential projects.

5 Multi Year Action Plan

5.1 Identification of Energy Projects

The District uses a mix of fuel sources. Fossil fuels remain highly carbon-intensive, whereas electricity in British Columbia has a low carbon intensity due to hydroelectric generation. Wherever feasible, electrification is prioritized. However, full electrification in the short to medium term is constrained by a number of factors. These include:

- technological limitations;
- insufficient electrical service capacity;
- the time and cost associated with service upgrades; and
- the absence of viable business cases for certain equipment and activities.

As extreme weather events are expected to increase, strengthening infrastructure resilience is critical to maintaining community safety and the continuity of essential municipal services. On-site and off-site renewable energy generation and energy storage for municipal facilities can contribute to both carbon reduction and improved resilience

Key opportunities to reduce energy use and emissions across municipal facilities and infrastructure, along with the estimated energy and emission reduction potential are summarized in Table 9. The opportunities represent significant potential to reduce energy consumption, operating costs, and greenhouse gas emissions while supporting long-term sustainability goals. The Sustainability team will continue to work with Infrastructure Planning, Facilities, and Public Works to identify priority projects.

Table 9: District energy and emissions reduction opportunities.

Strategic Areas	Potential Opportunities	Energy and emissions reduction potential
Building Energy Efficiency (Reducing the current average EUI of 397 kWhe/m^2 for key facilities to 290 kWhe/m^2 benchmark)	• Lighting retrofits • Envelope upgrades, • Continuous optimization • End of Life equipment replacement • Staff awareness & engagement	• Up to 1,453 MWhe /yr energy savings and • GHG reduction up to 260 tCO_2e/yr
Fuel switching (Electrify heating and cooling)	• Replace gas fired RTUs with electric systems	• Increase electricity by 1,253 MWh/yr
Wastewater Treatment (Improve energy intensity from 0.74 to 0.4 kWh/m^3)	• Blowers replacement • Variable Frequency Drives • End of Life Replacement • Process improvements	• 1,093 MWhe/yr energy savings • GHG reduction up to 10.8 tCO_2e/yr
Water System (Reduce energy use by 10%)	• Variable Frequency Drives, • Optimize pumping operations • End of Life replacement	• 150 MWh/yr energy savings • GHG reduction up to 1.5 tCO_2e/yr
Renewable Energy and Battery Storage (Incorporate Battery Storage for peak demand reduction)	• Mashiter Creek Hydropower • Anaerobic Digestion of Biosolid and organics • Rooftop solar PV on corporate buildings with Battery Storage • Ground mount solar on the landfill	• Generates 10,000 MWh /yr • GHG reduction of 99 tCO_2e/yr (Assuming the generation will offset grid electricity)
Fleet Electrification (Replace diesel and gasoline vehicles with appropriate EVs and low carbon alternatives)	• Acquire more EVs and low carbon fleet vehicles • Install charging infrastructure	• Saves 113,875 L of diesel and 87,173 L of gasoline/yr • GHG reduction of 485 tCO_2e/yr
Total Potential Energy and Environment Impact	• Energy reduction: up to 2,696 MWhe (including NG) • Electricity Generation: Up to 10,000 MWh • Saves 113,875 L of diesel, 87,173 L of gasoline • GHG reduction of 856 tCO_2e	

The District has been actively pursuing energy efficiency initiatives for the past ten years. A summary of the completed energy studies that identify opportunities for energy conservation and emissions reduction across key facilities is provided in Appendix 4: Completed Energy Studies. These studies assessed buildings and infrastructure such as the Squamish Adventure Centre, Mamquam Wastewater Treatment Plant, BPRC and the

proposed Mashiter Creek Hydropower Project. Recommended measures include building envelope upgrades, high-efficiency equipment replacements, thermal energy optimization, and renewable energy generation. Several initiatives demonstrate strong potential to reduce electricity and NG consumption, lower emissions, and improve long-term operational efficiency, although some require significant capital investment and further planning prior to implementation.

In addition to these studies, the District has successfully implemented several energy and emissions reduction projects. A summary of completed and ongoing projects is provided in Appendix 5: Completed Energy and Emission Reduction Projects. These projects include the installation of dual-fuel heat pumps at the Squamish Adventure Centre, conversion of streetlights to LED technology, commissioning of the all-electric Tantalus Firehall with on-site solar generation, and advancement of fleet electrification. Collectively, these initiatives have achieved measurable reductions in energy use, operating costs, and greenhouse gas emissions. Ongoing initiatives, such as the Brennan Park Recreation Centre revitalization, are expected to deliver further reductions and support the District's long-term sustainability and climate objectives.

The strategic opportunities identified through these studies and completed projects form the basis for the multi-year action plan discussed in Section 5.2.

5.2 Multi-Year Action Plan

The proposed multi-year project plan identifies key strategic actions to achieve short- and long-term energy and GHG reduction targets. These actions align with the Community Climate Action Plan (CCAP), the Municipal Energy Efficiency Plan (MEEP), and commitments under the BC Hydro Continuous Energy Management (CEM) Program. The multi-year action plan is presented in Table 10. The projects listed in Table 10 are based on current information and anticipated outcomes of future studies and assessments. They align with emission reduction targets while considering other criteria, including:

- Lifecyle cost analysis
- Energy saving potential
- End of life replacement
- Improve operational performance and reliability
- Alignment with District's capital projects schedule and financial plan

The list will be revised and refined as more studies are conducted and perhaps some projects advance through design and implementation.

Table 10: Multi Year Action Plan: 2025-2030.

Year	Project /Saving Source 26-27	Demand Savings (kW)	Electricity Savings (kWh/yr)	Natural Gas Savings (GJ/yr)	GHG Avoidance (tCO2e/yr)	Monetary Savings ($/year)
2025 - 26	SL-Integrated Energy Audits* (Consultant Selected)		5,500	128	6.4	$1,885
2025-26	GS- Energy Management Assessment Actions (Workshop Completed)					
2025-26	GS-Sustainable Energy Management Plan* (in implementation)					
2025-26	BPRC-Green and Accessibility Retrofit Project - Ice rink and pool energy recovery: pool water heating via heat exchanges, chillers, update rooftop units (8x hydronic heat pumps) (in implementation)		-251,604	5,432	267.7	$26,644
2025-26	BPRC-Green and Accessibility Retrofit Project- Areana wall and roof Insulation (in implementation)		31,829		0.3	$3,501
2025-26	MH-EnergyScan		25,350		0.3	$2,789
2025-26	PW-Feasibility study of a Solar Battery system for the public works office and workshop (RFP completed)	75	65,000		0.6	$7,900
2025-26	VFD installed at Queensway Lift Station (completed)		35,000		0.3	$3,850
2025-26	RCMP-Integrated Energy Audits including rooftop solar PV potential* (Consultant Selected)		17,500	227	11.5	$4,195
2025-26	SAC-HVAC upgrade - Installation of dual fuel RTUs, and electric for the third one			200	9.9	$2,000

Year	Project /Saving Source 26-27	Demand Savings (kW)	Electricity Savings (kWh/yr)	Natural Gas Savings (GJ/yr)	GHG Avoidance (tCO2e/yr)	Monetary Savings ($/year)
	(in implementation)					
2026 - 27	**BPRC- Feasibility study of a Solar Battery system for splash park (RFP completed)**	100	90,000		0.9	$10,900
2026 - 27	**FH1-Continuous optimization (C-op)***		25,826	2	0.4	$2,861
2026-27	**BPRC-Building enclosure upgrades- External Revitalization (in implementation)**		20,000	1,400	69.8	$16,200
2026-27	**PW-IEA for Water System ***		172,822		1.7	$19,010
2026-27	**PW-IEA for the WWTP***		180,000		1.8	$19,800
2026-27	**RE-Feasibility study of methane production from the anaerobic digestion of biosolids***	50	450,000		4.5	$50,000
2026-27	**PW-Fleet Electrification Master Plan (In RFP process)**	740,000 (Fleet Fuels (MWhe/yr)			159	$54,325
2027-28	**GS- Metering Gap Analysis**					
2027-28	**PW-Blower replacement for WWTP - Revisiting Feasibility Study ***	28	321,700		3.2	$35,667
2027-28	**RE-Revisit feasibility study of Mashiter Creek Hydro Power Project***	581	2,860,000		28.3	$320,410
	Total	**834**	**4,048,923**	**7,389**	**567**	**581,937**
*** Refers to project studies that will be the basis for the project implementation in future**						

Based on current estimates, the cumulative impact of the projects identified in Table 9 includes approximately 4,049 MWh per year of electricity savings or generation and 2,053 MWhe per year of NG savings. These reductions correspond to an estimated 367 tonnes of CO_2e avoided annually, resulting in an annual monetary savings of approximately $527,612.

It is unlikely that the district will achieve the physical energy savings targets of 200,000 kWh in the first year. The studies conducted during 2026–27 will provide a foundation for acquiring grants, and/or include in capital budget for the implementation beginning in 2028 and beyond. In the meantime, the Sustainability team will work with departments to conduct new studies that identify and assess the feasibility of new opportunities while working on implementation of already identified opportunities. The list of project/ initiatives for 2028 and beyond is presented in Table 11

Table 11: Project/Initiatives for 2028-2030, and beyond.

Project /Saving Source	**Year**
GS- Sustainable Energy Management Plan Update	2027-30
GS- Municipal Energy and Emission Plan Update	2027-28
GS- Communication, Engagement and Information Sharing	2026-30
BPRC-Installation of Solar Battery system for the splash park (100 kW and 250 kWh Battery Storage)	2029-30
BPRC-Roof and HVAC replacement	2030-31
BPRC – Continuous Optimization	2030-31
FH2-Feasbility and the Installation of battery to the existing PV system (500 kWh Battery)	LTP
PW-Replacement of Blowers with the hybrid type	2029-30
PW-Installation of solar battery system for the public works building (75 kW solar + 500 kWh Battery)	2030-31
RCMP-Rooftop Unit Replacement	2029-30
RCMP-Lighting retrofit	2029-30
RCMP-Building Automation System (BAS) Upgrade and Continuous optimization	2029-30
SAC-Envelope upgrade - Airtightness	2028-29
SAC-Envelope upgrade - Glazing Retrofit	LTP
SAC-Replacement of dual fuel RTU with electric ones	LTP
RE-Feasibility study of wind energy generation in few locations	2030-31
RE-Rooftop Solar PV potential for our corporate buildings and facilities	2027-28
RE-Development of Mashiter Creek Hydro Power Project (581 kW system)	LTP
RE-Development of the anaerobic digestion of bio-solid and integration with the landfill gas for CHP	LTP
RE-Feasibility Study of Solar PV on the existing landfill once it is full and closed.	2029-30

5.3 Energy Management Assessment Actions

An Energy Management Assessment (EMA) workshop was conducted on June 23, 2025. The EMA reviewed the extent that the District has incorporated energy management and carbon

reduction practices into its operations and governance and identified priorities for actions to be taken in the next two years. The workshop was facilitated by Prism Engineering and supported by BC Hydro. Four key energy management areas of influence focused during the EMA workshop are presented in Table 12.

Table 12: Key Energy management areas of influence.

Area of Influence	Description
Business	Assesses the overall organizational structure, strategies and plans relating to energy management.
Operations	Assesses the company's operations and actions towards implementing energy management plans and targets.
People	Assesses the extent to which people are responsible and accountable for energy management.
Technology	Assesses what technologies and projects have been identified, funded and put in place to achieve savings.

The EMA indicated that the District has an initial energy management program with some structured energy management activities. The organization is striving to achieve a more integrated energy management program that becomes a fundamental part of the business operation and strategic planning. The list of action items to achieve the priorities set by the EMA workshop are presented in Appendix 6 while the progress on priority EMA actions is presented in Table 13.

Table 13: Progress on EMA identified actions until Q3 of Year 1.

Year 1			
Action	Priority	Progress note	Until Q3
(B2) Business - Plan	**A**	Solicit input from multiple departments to iteratively refine the CSEMP and increase organization-wide support.	**CSEMP workshop is scheduled for February 2**
		Develop a CSEMP that identifies scope and describes energy improvements.	**In Progress**
		Set energy reduction and/or intensity targets.	**In Progress**
		Describe actions required to meet objectives and targets.	**In Progress**
(T4) Technology - Reporting	**A**	Develop a energy reporting plan that identifies who sees what when.	**In Progress**
		Establish energy baselines to measure energy performance against.	**In Progress**
		Normalize energy use to reflect operating conditions and external environmental factors.	**Normalization is done for key accounts as part of the CSEMP**
(T1) Technology - Opportunities	**A-**	Commission site audits and RCx studies to identify how, where & when energy is being used & what opportunities exist to save energy.	**Squamish Library and RCMP building are selected for IEA; Firehall #1 is approved for C-OP**
		Build out a comprehensive Opportunity Register that is maintained regularly.	**In Progress**
		Institute a process for regularly updating the list of opportunities with input from key stakeholders (i.e. FCM).	**Create a "Live Master Folder" on SharePoint and share with Ian and Warren**
(O3) Operations - Optimization	**A-**	Assess training needs for staff to modify controls to major systems to improve energy performance.	**Discuss with the facility manager - training is scheduled for Brennan Park Recreation Centre after the completion of the HVAC renovation.**
(B4) Business - Investment	**A-**	For any identified energy projects, determine costs, savings and payback.	**Developed a list of opportunities based on completed studies and 10-year financial plan.**
(P3) People - Communication	**B**	Establish a formal communication plan that includes a timeline of what gets communicated when, how and to whom.	**Communication Strategy is developed and included in the CSEMP**
		Host annual Lunch & Learn at the time of pulsing LGCAP.	**LGCAP is included in CSEMP workshop which occurred on February 2**

5.4 Resource requirements

Implementing the Corporate Strategic Energy Management Plan (CSEMP) initiatives will require significant long-term investment. The District currently funds energy efficiency and renewable energy investments within existing capital budgets. At times, additional funds can be added from Sustainability budgets. These funds come from the District's Carbon Neutral Reserve, which is the money that comes from the LGCAP. (The Carbon Neutral Reserve also funds the Corporate Energy Specialist Community Energy Coordinator positions.) These resources are primarily used to develop and update plans and policies, and to conduct energy studies while allowing the district to leverage external funding and technical support programs, including through BC Hydro's Commercial Energy Manager (CEM) Program. The CEM program will continue to be used toward:

- energy audits
- feasibility studies
- continuous optimizations
- supporting the implementation of capital energy efficiency projects through available incentives
- development of plans and policies that prioritize efficiency and emissions reductions

To maximize the effective use of internal resources and external funding, the District will align energy efficiency and renewable energy projects with scheduled maintenance and capital projects. There are following 10 initiatives included in the 2026-35 financial plan that directly or indirectly supports corporate energy efficiency initiatives:

- RCMP Lighting Upgrade to Energy-Efficient LEDs
- RCMP Building Automation System (BAS) Upgrade
- RCMP Mechanical Upgrade - Replacement of Heat Pumps
- Municipal Hall Rooftop Unit Replacement
- Library Improvements - HVAC Replacement
- Brennan Park Service Upgrades and Electrification Allowance
- Brennan Park Building Envelope Upgrades
- Brennan Park Recreation Centre - Roof and HVAC replacement
- Adventure Centre - Building Envelope Repairs
- Climate Action - Energy Specialist

6 Monitoring Progress

Energy data are currently monitored on an ad hoc basis (often in response to operational issues) with SCADA systems used to support root cause identification. FortisBC data is managed by Finance and BC Hydro data is managed by the Electrical Supervisor, which limits the ability to conduct comprehensive energy analysis. To address monitoring challenges, the District has implemented a GHG accounting software platform to track emissions across all buildings and infrastructure. The platform also provides the capability to track energy consumption, support analysis, and serve as a centralized backup data source for all utility accounts.

Energy profiles have recently been developed for all key facilities using ENERGY STAR Portfolio Manager (ESPM). Utility data are securely linked and uploaded automatically on a monthly basis, enabling consistent comparison of building energy performance, energy use, and associated emissions. ESPM will support benchmarking, analysis, and reporting activities.

In addition, the Sustainability team has introduced monthly energy reporting tools that utilize 5-minute interval consumption data to monitor and analyze building performance. This approach allows staff to identify trends, detect abnormalities, and support preventative maintenance through continuous operational oversight. Building and facility energy performance will be reported on a monthly and annual basis, with results communicated to staff, supervisors, and managers. Energy-related projects will be monitored as appropriate, using project-specific commissioning and reporting approaches. Case studies will be developed and shared internally to support knowledge transfer and continuous improvement.

New Key Performance Indicators (KPIs) that can be used to monitor progress are presented in Table 14. KPIs will be updated annually to reflect project status, data availability, outcomes, and progress toward targets, and to inform the development of future actions and budgets.

Table 14: KPIs for the CSEMP

KPI	Units	Measurement of Success	Data Source	Frequency
Energy Utility use	kWh, GJ, $	Compare to previous years	BC Hydro and Fortis BC Energy Bills	Annually
Energy Use Intensity of Key Buildings	kWhe/m2	Compare with Building Benchmark database and baseline	Energy Star Portfolio Manager	Annually
Daily water demand (existing KPI)	L/person/day	Compare to baseline and previous years	DOS operations data	Annually
Average Energy Use Per 1000 L of water delivered	kWh/m3	Compare to baseline and previous years	GHG accounting software, Public Works	Annually
Average Energy Use Per 1000 L of influent for wastewater treatment plant	kWh/m3	Compare to baseline and previous years	GHG accounting software, Public Works	Annually
Fleet EVs (existing KPI)	% of fleet vehicles	Compare with previous years	Fleet records	
Fleet EV usage	% of km travelled	Compare with previous years	RTL data / Telematics	Annually
Renewable Energy Generation	kWh	Compare with previous years	Local meter associated with RE - Application Programming Interface (API)	Annually
Corporate GHG emissions (existing KPI)	tCO2e	Compare to baseline, previous years and similar communities	GHG accounting software	Annually

7 Communications and Engagement Strategy

To support the successful implementation of energy-efficiency initiatives, the District must structure its communication and engagement activities to ensures that messaging is consistent and targeted throughout the organization. The Table 15 summarizes how to engage the District internally regarding the CSEMP, and a communication calendar for 2026 is presented in Table 16.

Table 15: Communication tools for engagement at corporate level.

Communication Channels	Frequency	Target Audience	Activities
CAO updates	As needed	All Staff	• Key announcements and progress updates
Lunch & Learn workshops	Annually	Supervisors and Managers	• Webinar on energy emission data, LGCAP reporting, energy initiatives and operational best practices
District Newsletters	Biannually	All Staff	• Highlights of ongoing projects and organizational achievements • Examples of completed projects and lessons learned
Reporting for key accounts	Monthly	Supervisors and Managers	• Performance reporting and operational insights
SLT meeting	Annually	Senior Leadership Team	• Strategic updates and direction setting

Table 16: Communications Calendar 2026.

Communication/ Campaign	2026											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CAO updates	----------ongoing----------											
Lunch & Learn workshops											X	
District newsletters					X						X	
Reporting for key accounts	X	X	X	X	X	X	X	X	X	X	X	X
SLT meeting									X			

8 Risks & Challenges

Effective energy management in Squamish must account for a broad range of factors. This section identifies various risks and challenges, along with potential impacts and proposed mitigation responses.

- **Electrification**

Electrification of building heating, cooling and other equipment reduces the reliance on fossil fuels and reduces emissions. Electrification may require upgrades in electrical services and/or electrical systems, which can be costly. A strategic phasing approach for electrification can help reduce the cost burden to the District, and on-site renewable energy generation may also reduce the need for upgrades.

- **Changes in Building Use Hours or Occupancy**

Changes in operating hours or higher-than-anticipated occupancy of District buildings could increase energy consumption, peak demand and/or equipment wear. To address this risk, building energy baselines should be regularly updated, energy use should be continuously monitored, and operating schedules and control strategies should be adjusted to reflect actual building use.

- **Population Growth**

Ongoing population growth in Squamish may increase demand for municipal facilities and services, leading to higher energy use and emissions if not proactively managed. This challenge can be mitigated by integrating energy and emissions targets into long-term growth and capital planning, ensuring new facilities (and vehicles) meet high-efficiency and low-carbon standards, and aligning energy management strategies with broader community and climate goals. Population growth is considered throughout the CSEMP

- **Increased Programming**

Expansion of municipal programming and services, particularly during evenings and weekends, can result in higher energy consumption and reduced operational efficiency. This risk can be managed through optimized building scheduling, energy-aware programming decisions, use of efficient equipment and controls, and tracking the energy impacts of new or expanded programs.

- **Use of Fossil-Fuel Systems for Resilience**

The consideration of fossil-fuel-based systems for backup or resilience purposes may increase GHG emissions and create long-term dependency on carbon-intensive energy sources. To manage this risk, low-carbon and renewable resilience options should be prioritized, fossil-fuel systems limited to emergency use where necessary, and a clear

transition plan established to align resilience planning with Squamish's climate and energy transition objectives.

- **Renewable Energy Generation and Storage**

District involvement in renewable energy generation and storage carries risks including high upfront capital costs, market volatility, and challenges operating new technology and systems. These risks can be mitigated through phased project development, robust feasibility and lifecycle cost analysis, use of proven technologies, long-term power purchase, active stakeholder engagement, training and skill development. Financial risks can be reduced through leveraging grants, partnerships, or public–private models.

Appendix 1: List of all buildings and facilities

NAME / FACILITY	LOCATION	USE	DESCRIPTION	GFA (FT^{2})	YEAR BUILT
Adventure Centre	38551 Loggers Lane	Socio-cultural	Offices, kiosks, café	9,000	2005
Brennan Park Aquatic Centre	1009 Centennial Way	Recreation	Recreation	40,000	1992
Brennan Park Community Centre & Rink	1009 Centennial Way	Recreation	Recreation	40,000	1978
Brennan Park Concession / Parks Office	1009 Centennial Way	Recreation	Concession	2,000	1973
Cleveland Ave. Restaurant	37996 Cleveland Avenue	Other	Copper Coil Restaurant	1,200	1900
Dog Pound	39903 Government Road	Other	Dog pound	1,663	1975
Fire Hall #2- Tantalus	40439 Tantalus Road	Safety	Firehall/Lounge	15,203	1978
Fire Hall #1- Alex Munro	37890 Clarke Drive	Safety	Firehall/Lounge	4,700	1999
Forestry Building	42000 Loggers Lane	Other	Office	19,300	1991
Homeless Shelter / Drop-in Centre	37930 Third Avenue	Socio-cultural	Shelter	1,713	1965
Junction Park Building	37950 Cleveland Avenue	Socio-cultural	Office	1,145	1980
Public Library	37907 Second Avenue	Civic	Library	12,675	1997
Municipal Hall	37955 Second Avenue (Main/IT/Eng)	Civic	Office	19,767	1976/ 2016
Public Works – Fleet Maintenance workshop	39909 Government Road	Utility Services	Office	6,000	1970
Public Works - Office	39909 Government Road	Utility Services	Operations Yard	3,400	1973
RCMP Building	1000 Finch Drive	Safety	Police Station	22,247	2006
The 55	1210 Village Green Way	Socio-cultural	Multi-purpose room	10,000	2009
Youth Centre	1135 Carson Place	Socio-cultural	Recreation	4,831	1965
Downtown Community Policing Station (Telus building)	38080 Cleveland Ave.	Safety	Police Station	1,064	NA

Appendix 2: Inventory of Fleet Vehicles

Automotive –BEV	**13**
Automotive - Hybrid	1
Light Truck / Van	32
Medium Duty	13
Trailers	9
Heavy Duty Eq.	15
Heavy Duty trucks	11
Total	94

Appendix 3: Emission factors

Unit	Natural Gas Stationary	Diesel	Gasoline	Electricity	Propane
tCO2e/GJ	**0.049734428**	**0.06732136**	**0.065762332**	**0.00275**	**0.061**
tCO2e/L		**0.002581774**	**0.00219975**		**0.0015**
tCO2e/kWh				**0.0000099**	
Factor with respect to electricity	18.08	24.48	23.91	**1**	22.18

Appendix 4: Completed Energy Studies

The District has completed several studies to identify opportunities for energy conservation and emissions reduction. Some of the recommended projects have resulted in successful grant applications and are currently being implemented, while others have been incorporated into the District's capital improvement program. Additional projects are under review by the Sustainability Team. The studies completed to date are described below:

Squamish Adventure Centre (SAC)

The Squamish Adventure Centre (SAC) is a 9,902 sq. ft., single-storey facility built in 2005 and located along Highway 99. It functions as a social and cultural hub. The building (Figure 18) is generally in good condition, though some window seal deterioration has been noted. Feasibility studies of the building envelope identified replacing the perimeter glazing system and improving air sealing at walls and doors as energy saving and building improvement opportunities.

Figure 18: Squamish Adventure Centre.

These upgrades could reduce save up to 33 MWh of electricity per year, 300 GJ of NG, and reduce emissions by 25.8 tCO_2e/year. The total estimated cost for glazing and air-sealing improvements will be more than $1.6 million.

Mamquam Wastewater Treatment Plant – Energy Efficiency for the Aeration System

The Mamquam Wastewater Treatment Plant (MWWTP) includes influent screening, aeration tanks, secondary clarifiers (Figure 19), sludge dewatering, ultraviolet disinfection, odour control, HVAC, and general building lighting, and the wastewater collection system also includes 23 lift stations.

The aeration system, which consists of four 75 hp Hoffman centrifugal blowers, each with a rated capacity of 2,380 m^3/hr, supply air to most of the plant's process trains and operate with automated inlet throttling valves installed during the 2006 upgrades. The energy consumed by the aeration system account for nearly 30% of this plant usage.

Figure 19: Clarifiers at Mamquam Wastewater Treatment Plant.

An energy efficiency assessment identified hybrid blower replacement as the most feasible alternative which could reduce electricity demand by 28 kW, save energy by 321 MWh per year, reduce annual energy costs by $22,100, and emissions be 3.23 tCO2e/year. The increase in the replacement cost over standard replacement is $190,900 though the total project cost is $730,400. The payback period of such replacement is 8.6 years.

The study notes that the replacement should follow the completion of the MWWTP Master Plan, which will account for recent and future plant expansions. Actual energy and demand savings may be higher once electrical system constraints and future loads are fully defined.

BPRC Thermal Energy Study

The Brennan Park Recreation Centre (BPRC) is a major community facility owned and operated by the District of Squamish, with a total floor area of approximately 72,500 sq ft. The facility includes an ice arena, natatorium, gym, and community spaces. The arena and auditorium were built in 1977, and the aquatic centre was added in 1991.

Several system upgrades have been completed over the years, including the replacement of the arena ice plant condenser (2011), retrofitting the aquatic centre boilers and air handling units with condensing boilers and dehumidification heat recovery (2011–2012), and installation of UV water treatment systems in 2017–2018.

A 2021 thermal energy study further identified several energy conservation measures aimed at improving efficiency and reducing greenhouse-gas emissions, covering opportunities such as natatorium heat-recovery optimization, ice-plant heat recovery,

exhaust-air heat recovery, various rooftop unit upgrade options, arena wall insulation replacement, dehumidifier replacement, and the potential use of renewable NG.

These measures would increase the annual electricity demand by 69.3 kW and energy by 251,604 kWh, and reduce annual NG consumption by 5,341.8 GJ and emission by 256.3 tCO2e while saving the energy cost by $ 31,518

BPRC Building - Enclosure Study

A 2022 building enclosure retrofit study for BPRC (SeeFigure 20) identified several components requiring renewal to address end-of-life conditions and improve overall energy performance. The study found that the Auditorium and Natatorium roofs have exceeded their service life and require replacement, while the Ice Arena roof has roughly ten years remaining. The original single-glazed metal-framed skylight over the Natatorium has also reached the end of its service life and should be replaced in conjunction with roof work. Exterior wall systems, including concrete lower walls and metal cladding on upper steel structures, were found to contribute to poor airtightness—particularly in the Auditorium. Additionally, existing steel doors and transoms provide inadequate thermal resistance and airtightness, warranting full replacement.

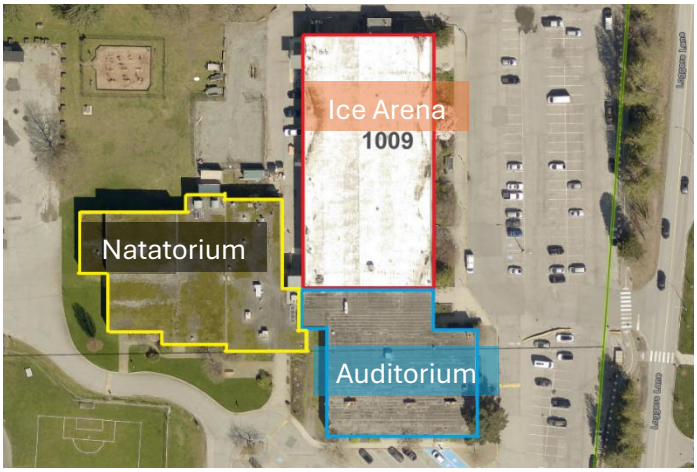

Figure 20: BPRC building.

RETScreen modelling show that enclosure improvements substantially reduce NG consumption, with minimal impact on electricity use. Estimated reduction in the usage of NG will 322 -540 GJ for Natatorium and 425 to 809 GJ for Auditorium, and reduction in GHG range from 16-27 tCO2e for the Natatorium and 21-40 tCO2e for the Auditorium.

Mashiter Creek Hydropower Projects

The proposed Mashiter Creek Run-of-River Hydropower Project is a potential future initiative that the District may pursue at a future point. This project would result in the generation of renewable electricity by utilizing existing municipal water infrastructure while maintaining the function of the emergency backup water supply. The project would use the existing 3.2 km pipeline that conveys water from the diversion weir and intake to the Thunderbird Ridge reservoir.

Feasibility study conducted in 2016 evaluated several system configurations ranging from a 108 kW facility (87% plant factor) to a 581 kW facility (56% plant factor) which showed that the 581 kW configuration offers the strongest financial performance, generating approximately 2,860 MWh of electricity annually which is equivalent to around 35 % total electricity consumption in 2024. However, this would involve developing a new intake structure, pipeline, and powerhouse to maximize energy production. It is worthwhile revisiting the feasibility of the project in a changing context to revive the prospect of realizing the hydropower project.

Appendix 5: Completed Energy and Emission Reduction Projects

The district has completed several energy projects that have significantly reduced energy use, emissions, and costs through a combination of grant funding and in-house budgets. The following paragraphs highlight key completed and ongoing energy and emissions reduction projects, along with their associated impacts.

Dual Fuel Heat Pump Installation at the Adventure Centre

The District of Squamish has replaced its NG heating system at the Squamish Adventure Centre with a dual-fuel Rooftop Units system. The first unit was installed in 2024, followed by the second installation in 2025.

The electricity and NG consumption data indicates some reduction in energy consumption. The energy consumption has reduced from 1000 GJ in baseline year to 674 GJ in 2024-2025 which translates in 17.30 % savings in terms of site EUI and 8.50% in terms of weather normalized EUI.

Replacing streetlights to LED

The Public Works department at the District has replaced the majority of its streetlights with LED fixtures and continues to prioritize LED technology for all new installations. The electricity consumption by the streetlights is presented in Figure 21.

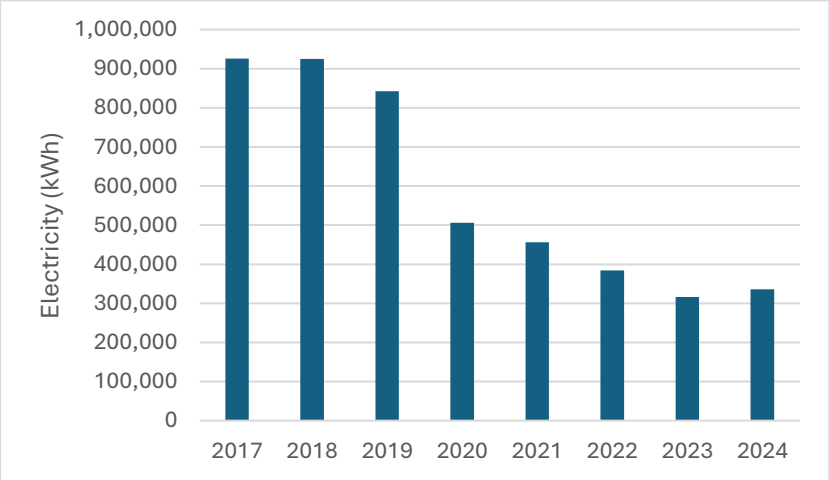

Figure 21: Energy consumption by streetlights (2017-2024).

Significant reductions in electricity use have been observed since 2019, when most replacements were completed. Between 2019 and 2020, the District replaced 655 High-Pressure Sodium (HPS) and 6 Metal Halide (MH) fixtures with LED units.

The project achieved a payback period of less than five years. Compared to 2017 consumption levels, annual electricity use for streetlighting has decreased by 600 MWh, annual emission is reduced by 5.94 tCO2e, and energy cost is reduced by $50,000 per year.

Tantalus Firehall – First Year Performance

The Tantalus Firehall is a 777 m^2 all-electric, net-zero-ready facility that was officially commissioned in 2024. The firehall is equipped with high-efficiency heat pumps, energy recovery ventilators, and a net metered 71.5 kW rooftop solar PV system (Figure 22). During its first year of operation (July 2024–June 2025), the building consumed 149,111 kWh of electricity, importing 115,007 kWh and exporting 30,756 kWh, resulting in a net import of 84,250 kWh. The solar PV system generated 64,860 kWh—equivalent to 43.5% of total consumption—and contributed to an Energy Use Intensity of 108.36 kWh/m^2, the lowest among the 52 firehalls participating in the Building Benchmark BC program.

Figure 22: Rooftop Solar PV at Tantalus Firehall.

Although the facility has not yet achieved full net-zero energy performance, important insights have emerged. Differences between modeled and actual operational energy use resulted in an under-sized solar PV system. Nonetheless, the firehall achieved significant emissions reductions, generating only 0.83 tCO_2e compared to 43 tCO_2e from the previous building. In its first year, the solar system produced electricity valued at approximately $10,731, and the all-electric design is estimated to have avoided an additional $15,294 to $31,992 in energy costs. Overall, the Tantalus Firehall strongly supports municipal sustainability goals and offers valuable lessons for future net-zero projects

Fleet electrification

The District of Squamish began electrifying its corporate fleet in 2020–2021 following the adoption of the CCAP and MEEP. To date, 13 Level 2 chargers have been installed across four municipal locations, and 13 electric vehicles

Figure 23: Corporate fleet vehicle and charging station.

have been added to the fleet.

Based on FLO charger usage data from 2021–2024, municipal EVs consumed 31,788 kWh, enabling 182,665 km of electric travel. This resulted in avoided fuel costs of $13,315 and a reduction of 30.16 tCO_2e in emissions.

Ongoing projects - BPRC Revitalization

The phase one project is grant funded ($11.8M) through the Green and Inclusive Community Buildings (GICB) grant includes following two significant energy retrofit among others is in implementation and expected to be completed soon:

- Retrofit of existing ice rink roof insulation
- Retrofit of existing ice rink / pool energy recovery system

These measures are anticipated to reduce the energy consumption by 1.2 GWhe, mostly NG, and emission by 256 tCO2e annually. The phase II project that includes building enclosure retrofit will begin in 2026.

Appendix 6: List of Identified EMA Actions

Key Attributes	Relative Priority	Actions
(O4) Operations - Design	**A**	Explore ways in which building operations staff could be brought into the design process for either new buildings and/or renovations.
(B2) Business - Plan	**A**	Solicit input from multiple departments to iteratively refine the CSEMP and increase organization wide support.
		Develop a CSEMP that identifies scope and describes energy improvements.
		Set energy reduction and/or intensity targets.
		Describe actions required to meet objectives and targets.
(T4) Technology - Reporting	**A**	Develop a energy reporting plan that identifies who sees what when.
		Establish energy baselines to measure energy performance against.
		Generate basic monthly & annual energy consumption or performance reports based on monthly utility invoicing.
		Normalize energy use to reflect operating conditions and external environmental factors.
(T1) Technology - Opportunities	**A-**	Commission site audits and RCx studies to identify how, where & when energy is being used & what opportunities exist to save energy.
		Build out a comprehensive Opportunity Register that is maintained regularly.
		Institute a process for regularly updating the list of opportunities with input from key stakeholders (i.e. FCM).
(O3) Operations - Optimization	**A-**	Establish a schedule for staff to regularly monitor and review building system controls and make adjustments to major systems controls.

Key Attributes	Relative Priority	Actions
		Assess training needs for staff to modify controls to major systems to improve energy performance.
		Deliver training for staff to modify controls to major systems to improve energy performance.
		Establish parameters for when building control systems changes are needed.
(T3) Technology - Monitoring	**A-**	Establish a standard Metering Plan for new construction / major renovations.
		Complete a metering gap assessment to for key loads and facilities to determine the need/benefit of sub-metering.
(B3) Business - Policy	**A-**	Develop an energy policy for the organization in collaboration with operations staff and key management personnel.
		Include Energy Policy content in MEEP where appropriate.
		Research energy policies from peer organizations.
(B4) Business - Investment	**A-**	For any identified energy projects, determine costs, savings and payback.
(O1) Operations - Maintenance	**A-**	Identify key equipment that should be included in a preventative maintenance program that addresses energy waste (i.e. by looking at large load equipment).
(P3) People - Communication	**B**	Establish a formal communication plan that includes a timeline of what gets communicated when, how and to whom.
		Host annual Lunch & Learn at the time of publishing LGCAP.
		Publish regular energy management communication in the organization's newsletter, or other appropriate channels (i.e., emails, posters, meetings).

Appendix 7: Key Internal documents

- Squamish Population and Housing Projections Report, 2025
- Community Climate Action Plan (2020, 2025)
- Municipal Energy and Emissions Plan (2019)
- Real estate strategy. (2018)
- Real estate and Facilities Master Plan (2019)
- 2024 water master plan update project report (2024)
- Sanitary Sewer Utility Master Plan (2025)
- Glazing Retrofit Feasibility Study - Squamish Adventure Centre Study (2022)
- Exterior Walls, Windows and Doors Evaluation for SAC (2025)
- Thermal Energy Study Report for BRPC (2021)
- Mashiter Creek Hydroelectric project – Feasibility Study (2016)
- Mamquam Wastewater Treatment Plant Draft Blower Energy Efficiency Study (2018)