

Township of Esquimalt - Building Retrofit Study Review

April 2026



Agenda

1. Project Overview
2. Review of Sites
3. Measures
4. GHG Reduction Scenarios

Background

The Township of Esquimalt invited qualified consultants to submit proposals to conduct a Building Retrofit Feasibility Study to identify a near net-zero greenhouse gas reduction pathway for five municipal buildings owned by the Township, as well as other initiatives.

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WSP was selected. The project included energy audits, building condition assessments (BCAs), building air tightness testing with IR scans and GHG reduction scenarios for the selected sites.

The project is funded in part by FCM's Community Building Retrofit Program.

Project Overview

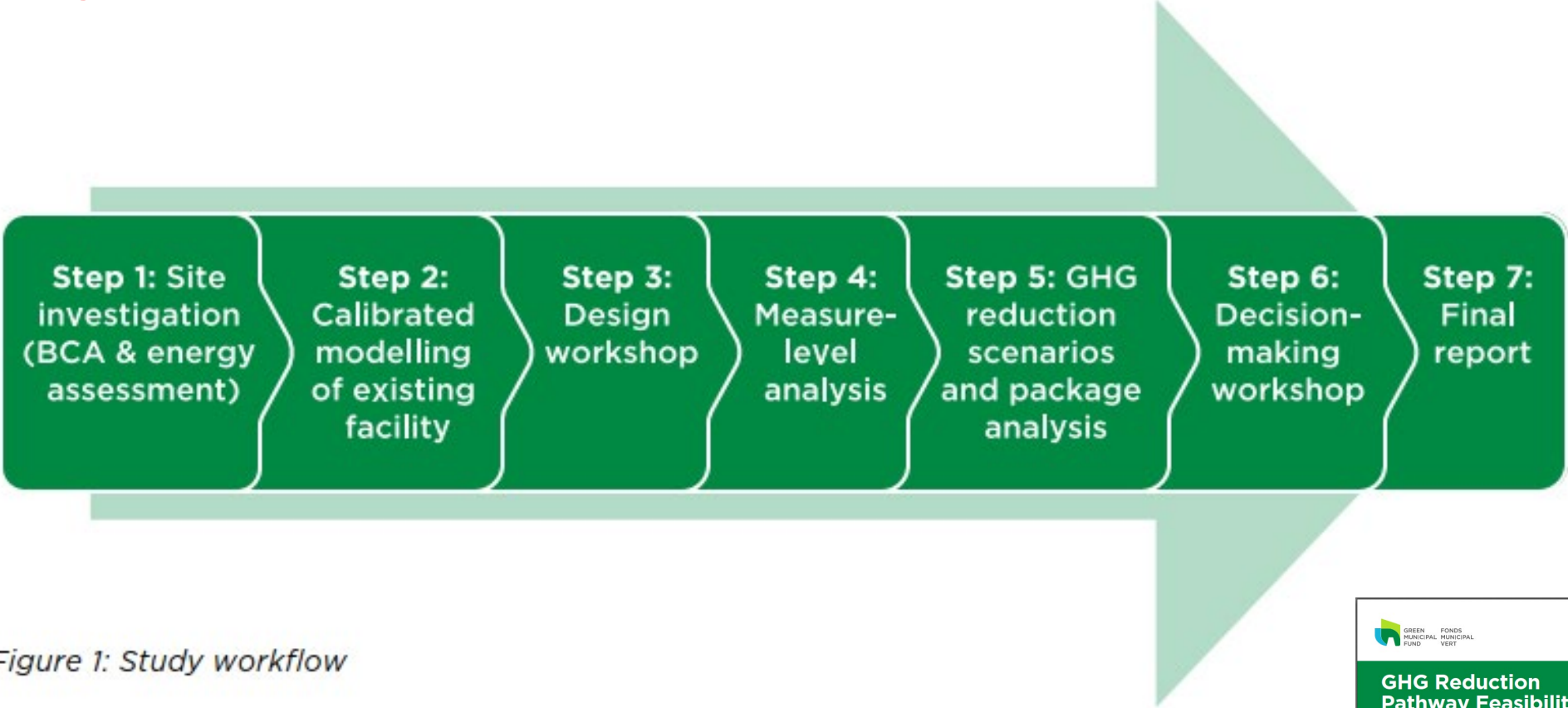
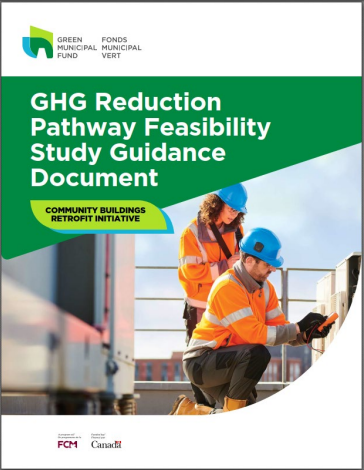


Figure 1: Study workflow



From GHG Reduction Pathway Feasibility Study Guidance Document

Team

Township of Esquimalt

Name	Title
Steve Knoke	Director, Parks and Recreation Services
Dan Henderson	Manager of Facilities
Kurt Reed	Facilities Supervisor

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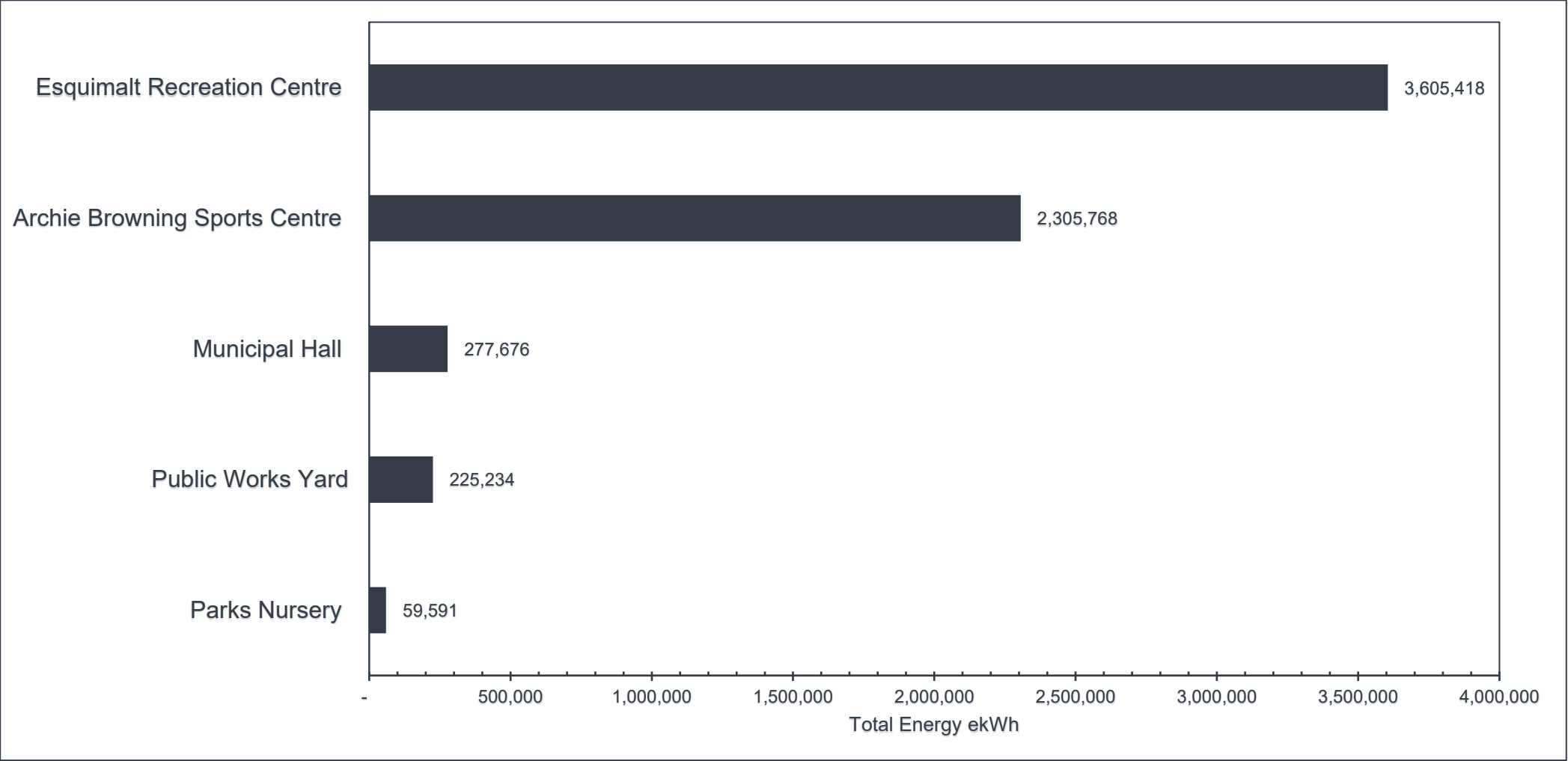
WSP Team

Name	Title
Jean-Emmanuel Dufour	Operations Manager
Carolyn Balant	Project Manager, Energy and Sustainability Specialist
Sonia Tsang	Energy Efficiency & Sustainability Specialist
Navid Ekrami	Project Manager, Energy and Sustainability Specialist
Paul Carter	Project Director, Building Sciences
Reid Thompson	Building Sciences Consultant

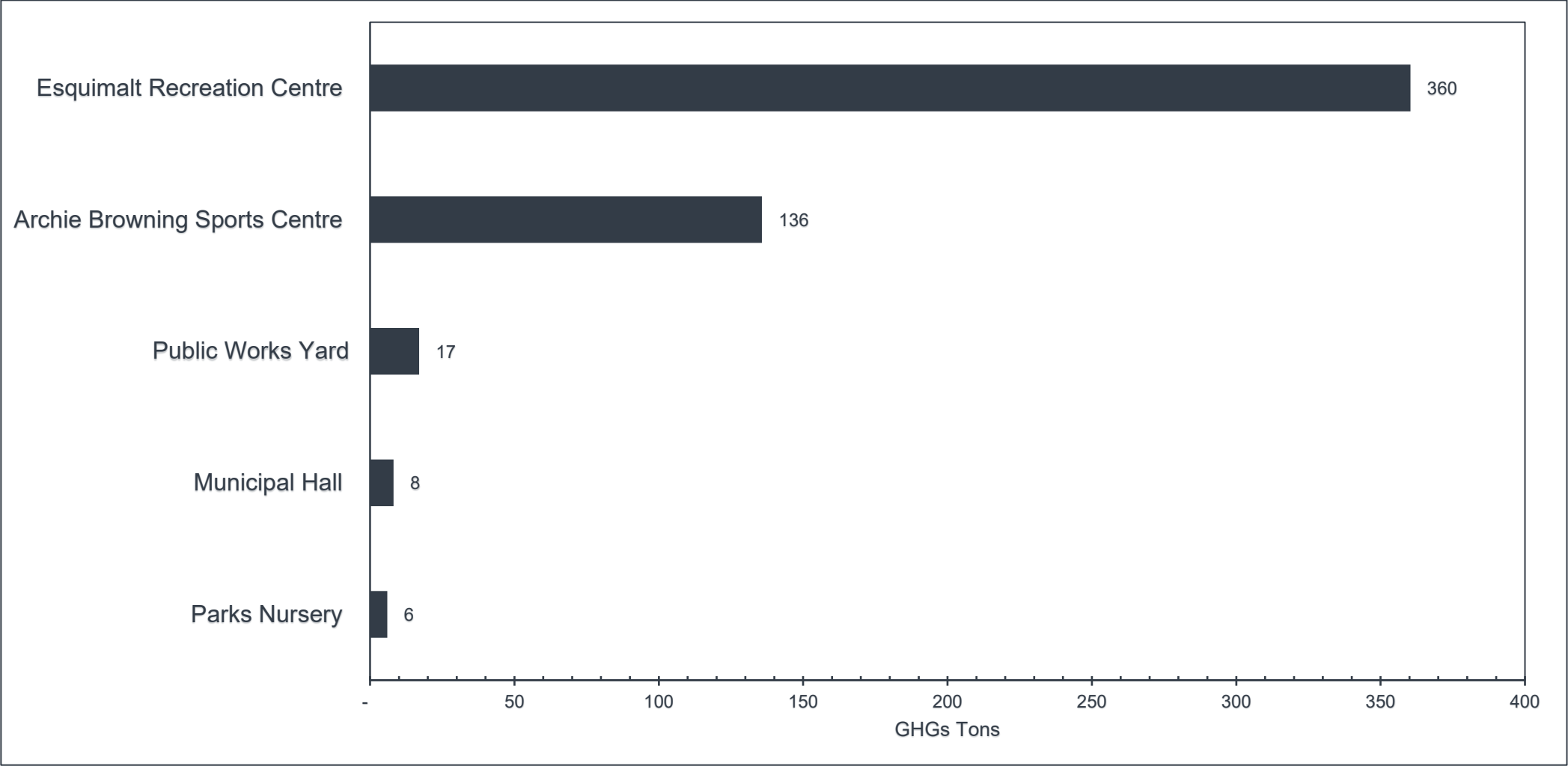
List of Project Facilities

1. **Esquimalt Recreation Centre** (527 Fraser Street)
 - Two swimming pools, gym, weight rooms, multi-purpose rooms, etc
2. **Archie Browning Sports Centre** (1151 Esquimalt Road):
 - Hockey arena and curling rink, changerooms, offices, etc
3. **Municipal Hall** (1229 Esquimalt Road):
 - Offices, council chamber, police offices, etc
4. **Public Works** building (601 Canteen Road)
 - Offices, mechanics shops, stores, etc
5. **Parks Nursery** building (1100 Craigflower Road)
 - Offices, storage spaces, old greenhouses

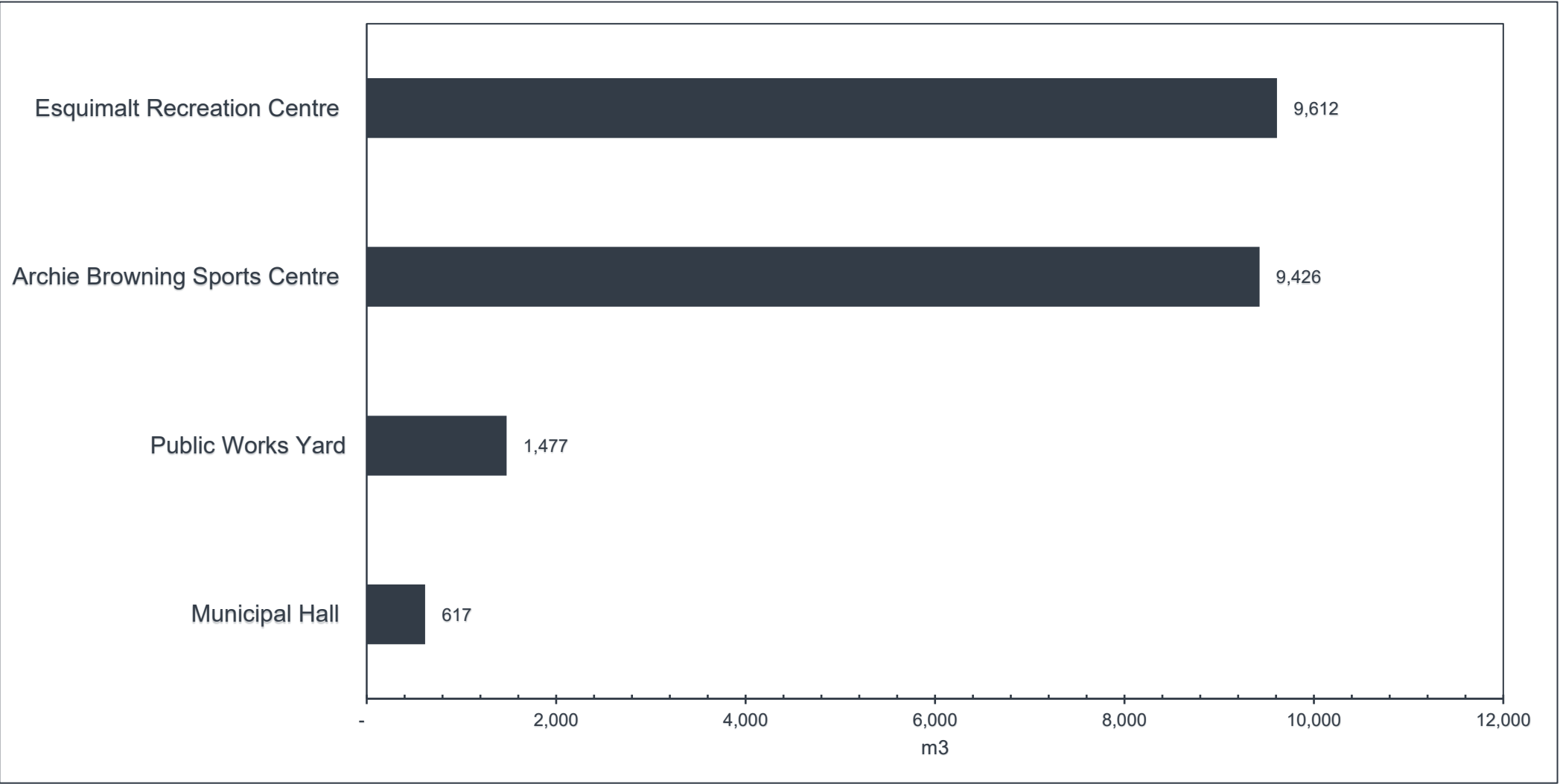
Facility Benchmarking - Energy



Facility Benchmarking – GHG Emissions



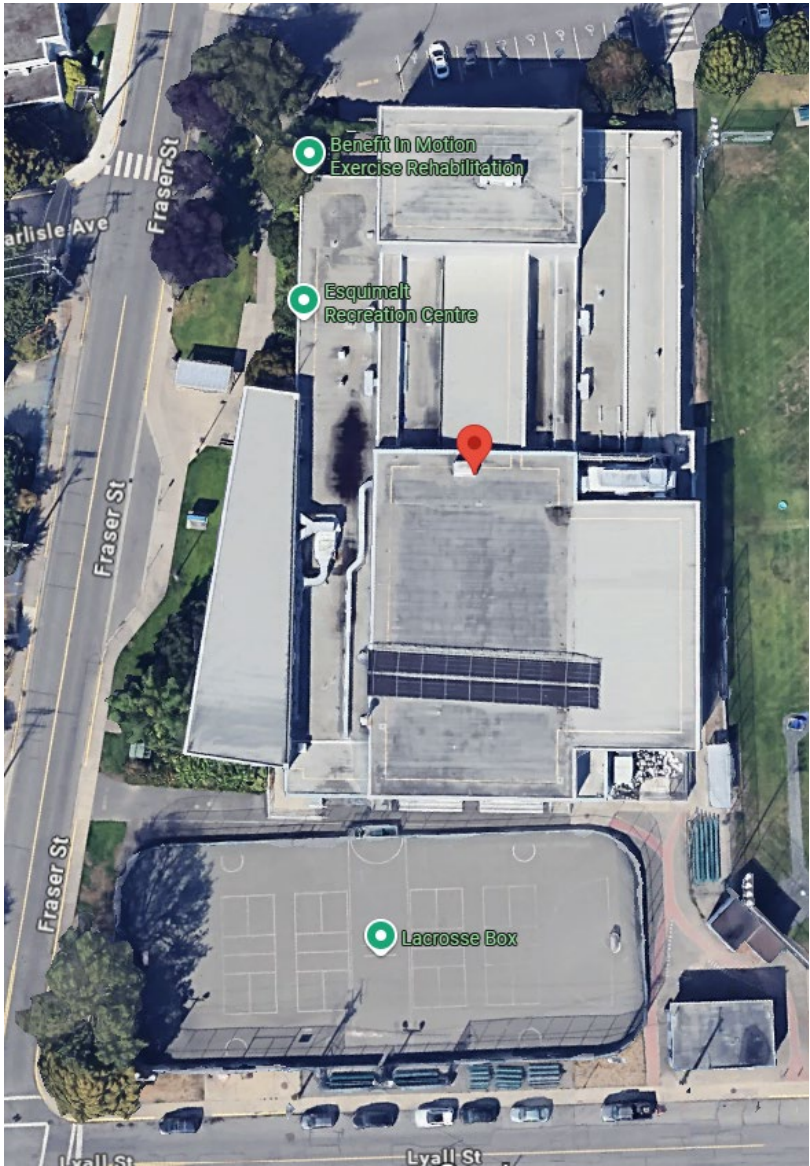
Facility Benchmarking – Water Usage



GHG Reduction Scenarios

1. **Short-term retrofit (5 years)** – Achieving a **45%** GHG reduction from **2010** levels.
2. **Medium-term retrofit (10 years)** – Achieving a **50%** GHG reduction from **2023** levels.
3. **Long-term retrofit (20 years)** – Achieving an **80%** GHG reduction from **2023** levels.
4. **Short-term deep retrofit (5 years)** – Achieving a **50%** GHG reduction from **2023** levels.
5. **Maximum site potential** – Identifying the greatest possible GHG reductions, regardless of cost.
6. **Optimized outcome** – Balanced approach of aggressive GHG reduction with asset management objectives

Esquimalt Recreation Centre – Summary



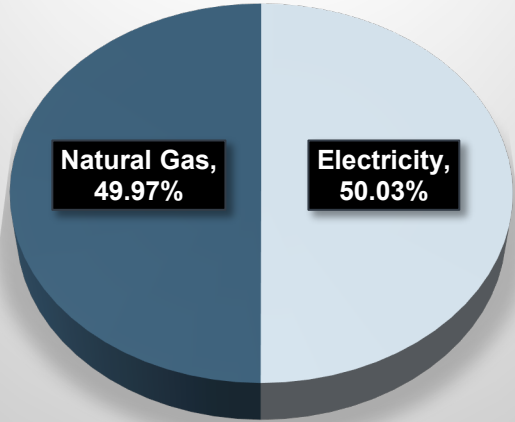
Name and Address	Esquimalt Recreation Centre 527 Fraser Street, Esquimalt,
Gross Floor Area	4,838 m2
Year Constructed	1973
Number of Levels	2
Parking	Outdoor parking space
Current Occupancy (%)	Full Occupancy
Building Usage	Aquatic centre, weight room, gymnasium and multi-purpose



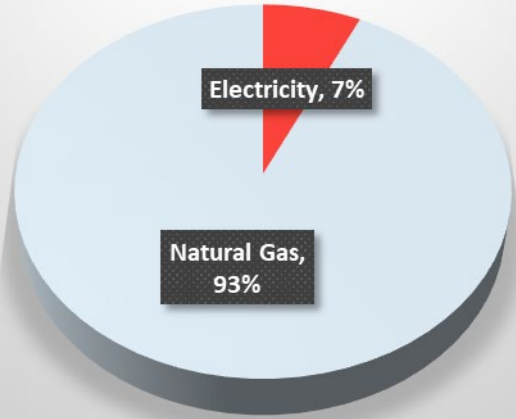
ERC – Summary of Energy and Water

Utility	Consumption		Equivalent Consumption		Cost	Savings Rate		Use Intensity (ekWh/ft²)
Electricity Consumption	1,803,827	kWh	1,803,827	kWh	\$27,654	\$0.0653	\$/kWh	34.72
Electricity Demand	3,265	kW			\$43,425	\$13.30	\$/kW/mo	
Natural Gas	6,486	GJ	1,801,592	ekWh	\$80,284	\$8.29	\$/GJ	34.68
Water	9,612	m³			\$15,798	\$1.87	\$/m3	
Total			3,605,418	ekWh	\$167,161			69.40

% of Total Energy



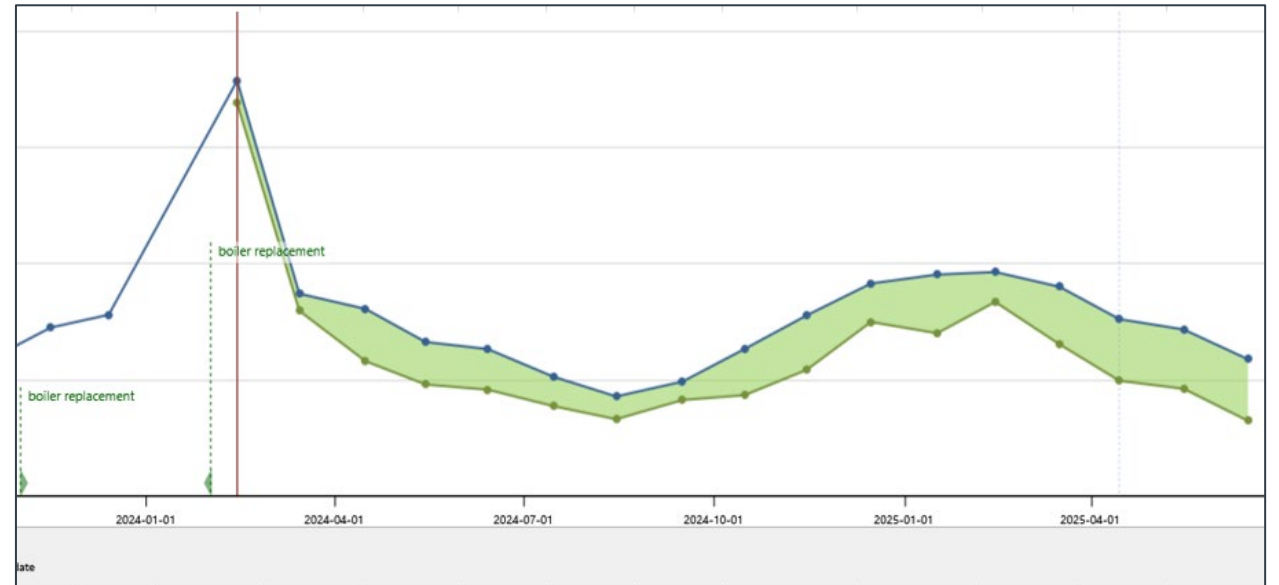
% of Total GHG Emissions



Performed Major Capital Renewal

- New condensing heating boilers (late 2023) – significant savings
- LED lighting retrofit (2018 - 2022)
- Upgraded the Building Automation System (BAS) (2019)
- Installed heat pumps HP3 through HP6 (2015)

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Expected Major Capital Renewal (BAU)

- Replace Pool (Detron) Unit (2026)
- Replace Flat Roof sections (2026 - 2028)
- Replace AHU-4 and AHU-5 (2029)

Proposed Measures (ECMs)

- Pool Cover – for small pool
- Jubilee hall occupancy sensor/door interlock
- BAS Recommissioning
- VSD for Pool Pumps
- Daylight Sensors for atrium

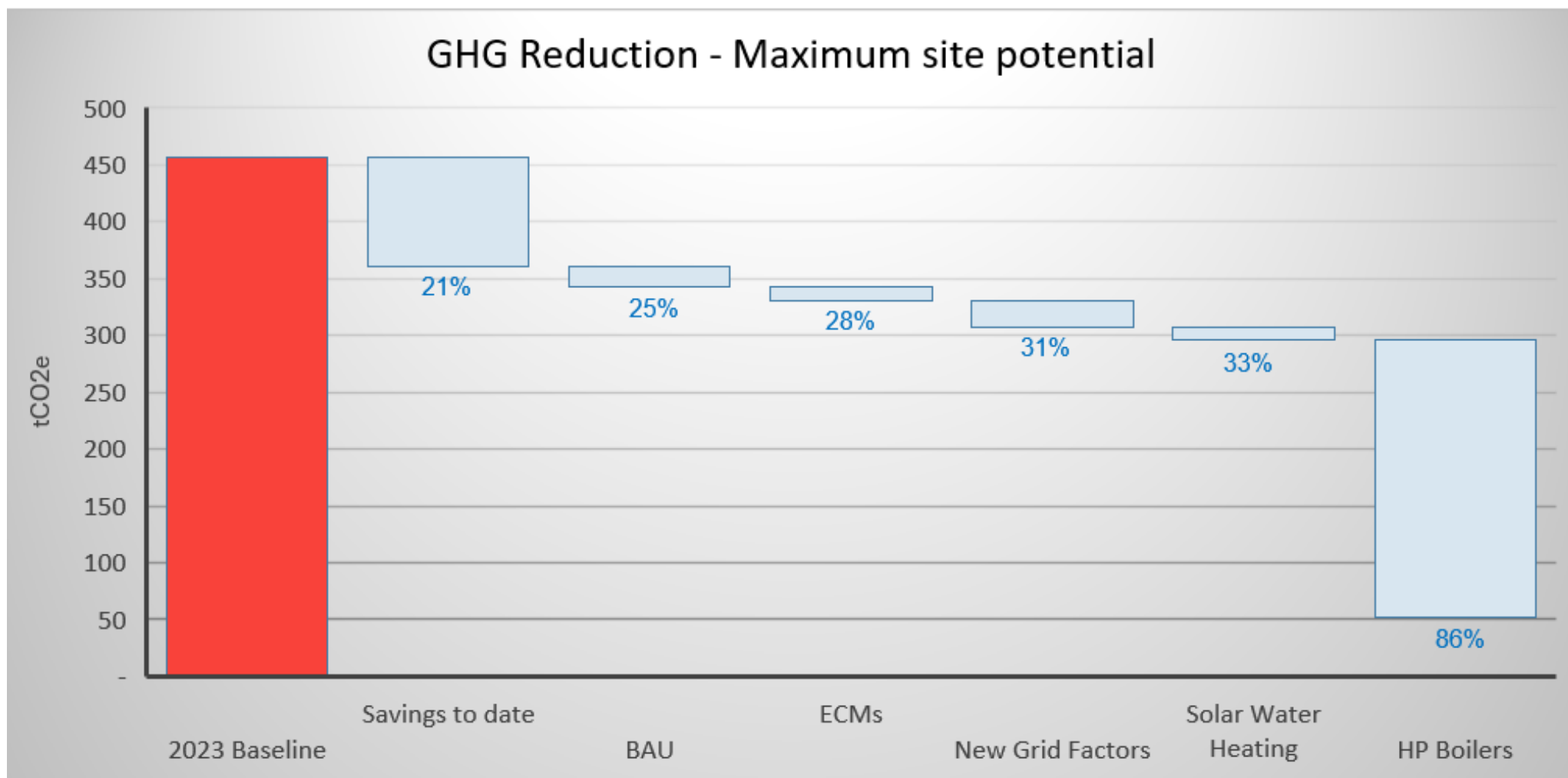
GHG Reduction Measures

- Solar Water Heating
- Heat Pump Boiler

Natural Gas Consuming Equipment

SYSTEM ID	DESCRIPTION
B1	Viessman Model #CA3B 3.0, natural gas condensing boiler, 2024
B2	Viessman Model #CA3B 3.0, natural gas condensing boiler, 2024
B3	Weil McLain, cast iron, natural gas boiler (back up), 2004
AHU-4	Engineered Air DJ40 with natural gas furnace coil, 2004
AHU-5	Engineered Air DJ40 with natural gas furnace coil, 2004

GHG Scenario 2023 Baseline



Archie Browning Sport Centre – Summary



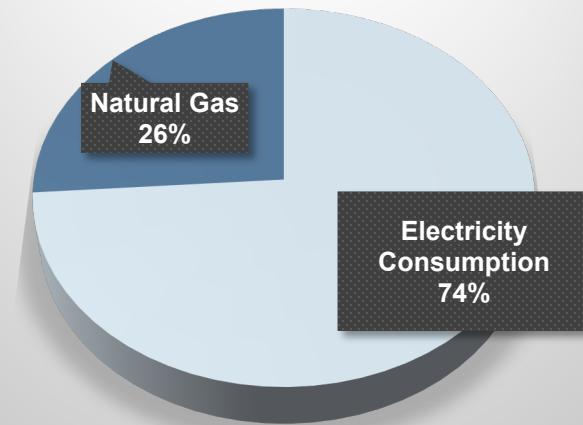
Name and Address	Archie Browning Sports Centre 1151 Esquimalt Road
Gross Floor Area	6050 m2
Year Constructed	1960
Number of Levels	2 storeys
Parking	Outdoor parking space
Current Occupancy (%)	Full Occupancy
Building Usage	Hockey and curling rink



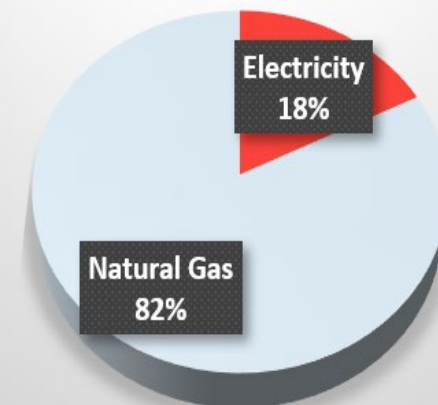
ABSC – Summary of Energy and Water

Utility	Consumption	Equivalent Consumption	% of total energy	Rate	Cost	Energy Use Intensity (ekWh/ft ²)
Electricity Consumption	1,704,194 kWh	1,704,194 kWh	74%	0.0653 \$/kWh	\$99,324	26.17
Electricity Demand	3,641 kW			13.30 \$/kW/mo	\$48,425	
Natural Gas	2,166 GJ	601,574 ekWh	26%	8.29 \$/GJ	\$28,338	9.24
Water	9,612 m ³			1.87 \$/m3	\$15,798	
Total Equiv. Energy Consumption		2,305,768 ekWh	100%	Total Cost	\$191,885	35.41

Energy Usage Breakdown

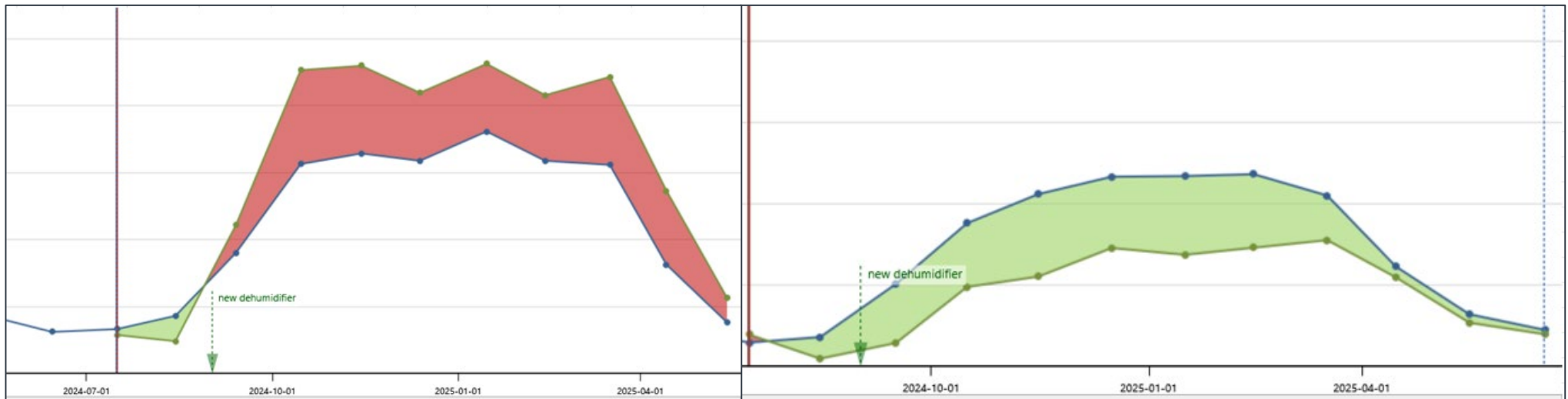


GHG Emissions Breakdown



Performed Major Capital Renewal

- 2025: Upgraded Crow's Nest lighting to LED
- 2024: Replaced hockey rink dehumidifier, DH-1;
 - Significant natural gas savings, electricity increase
- 2024: Replaced rooftop ice plant condenser;
- 2020: Replaced flat roofing membrane between two arenas
- 2018-2024: Ice plant equipment replacement and renewal
- 2018/19: Site LED lighting upgrade;



Issues

- Brine leaks in the slab
 - Pumps run continuously including in summer due to additive
- Heat recovery to ice melt pit insufficient
 - unable to melt ice without additional hot water
- Insufficient DHW
- Heating boilers old and approaching the end of useful life

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Expected Major Capital Renewal (BAU)

- Replace hockey rink slab header and brine piping
- Replace heating boilers
- Replace dehumidifier DH-2 (alternately use DH-1 for both rinks)
- Roof replacement – Phase 1

Proposed Measures

- REALice De-oxygenator – for ice resurfacing water
- BAS Recommissioning
- PV Panels

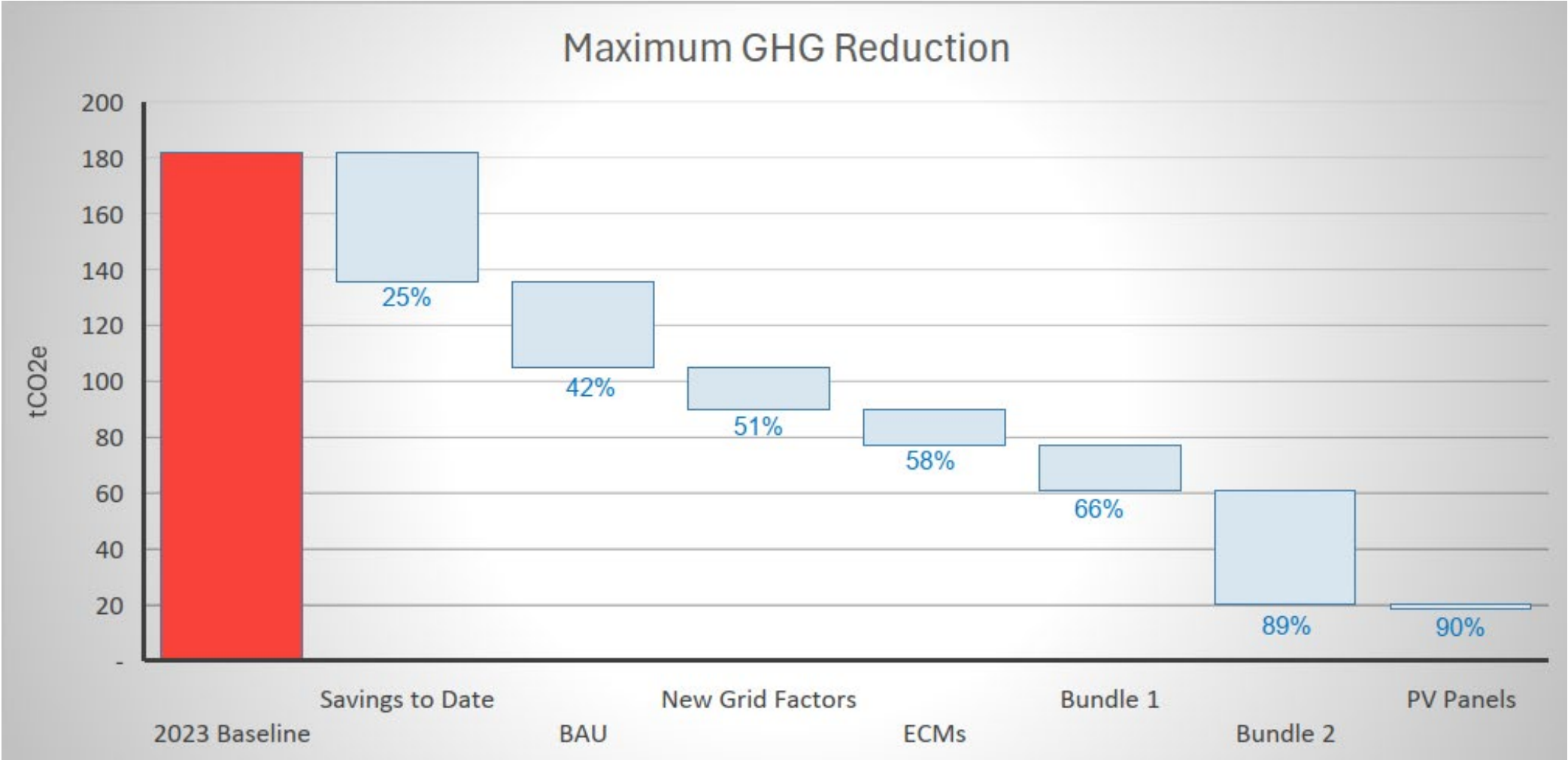
Polar Engineering Measures

- Snowmelt Pit Heat Recovery
- Arena Dehumidifier Preheat Coil
- Low-Flow Showerheads
- Site-specific Heatpump – HP Boiler

Natural Gas Consuming Equipment

SYSTEM ID	DESCRIPTION
Boiler 1	Natural Gas fired hot water boiler
Boiler 2	Natural Gas fired hot water boiler
DH-2	Munters Desiccant dehumidifier for the curling rink

GHG Scenario 2023 Baseline



Municipal Hall – Summary

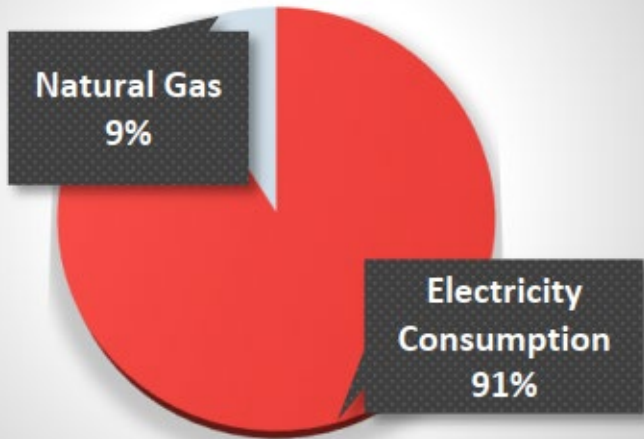


NAME AND ADDRESS	MUNICIPAL HALL – 1229 ESQUIMALT ROAD, ESQUIMALT, BC, V9A 3P1
Gross Floor Area	935 m ²
Year Constructed	2002
Number of Levels	3 Storey building, Police and municipal hall at first floor, and offices on the 2nd and 3rd floors
Cladding	The exterior walls are clad with acrylic stucco, stone veneer, and exposed cast-in-place concrete. Assemblies are generally constructed over steel stud framing with exterior sheathing along with, continuous rigid insulation outboard of the sheathing, and a self-adhered air/vapour barrier membrane, according to the architectural drawings. Shading elements are installed at various wall areas and consist of steel framing and corrugated metal panels mounted above glazed openings.
Parking	surface
Current Occupancy	full
Building Usage	Mainly administrative offices with police services

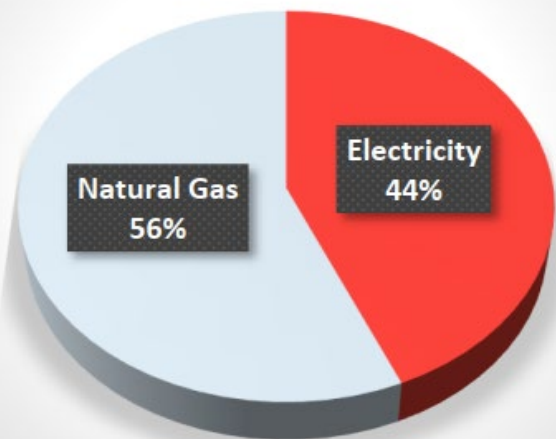
Municipal Hall – Summary of Utilities

Baseline Data (May 2024 - April 2025)									
Utility	Consumption		Equivalent Consumption		% of total energy	Rate		Cost	Energy Use Intensity (ekWh/ft²)
Electricity Consumption	252,998	kWh	252,998	kWh	91%	0.1080	\$/kWh	\$27,654	25.15
Electricity Demand	645	kW				6.03	\$/kW/mo	\$3,889	
Natural Gas	89	GJ	24,678	ekWh	9%	8.80	\$/GJ	\$1,650	2.45
Water	617	m³				1.87	\$/m3	\$397	
Total Equiv. Energy Consumption			277,676	ekWh	100%	Total Cost		\$33,589	27.60

Energy Usage Breakdown



GHG Emissions



Expected Major Capital Renewal

- Upcoming Renewals due to end of service life
 - Replace Two Older Split-System AC Units (2027)

Capital Renewal History

- Replaced All Flat Roofs (2024/25)
- Replaced 6 RTUs (2022)
- Upgraded DDC (2022)

Proposed Measures

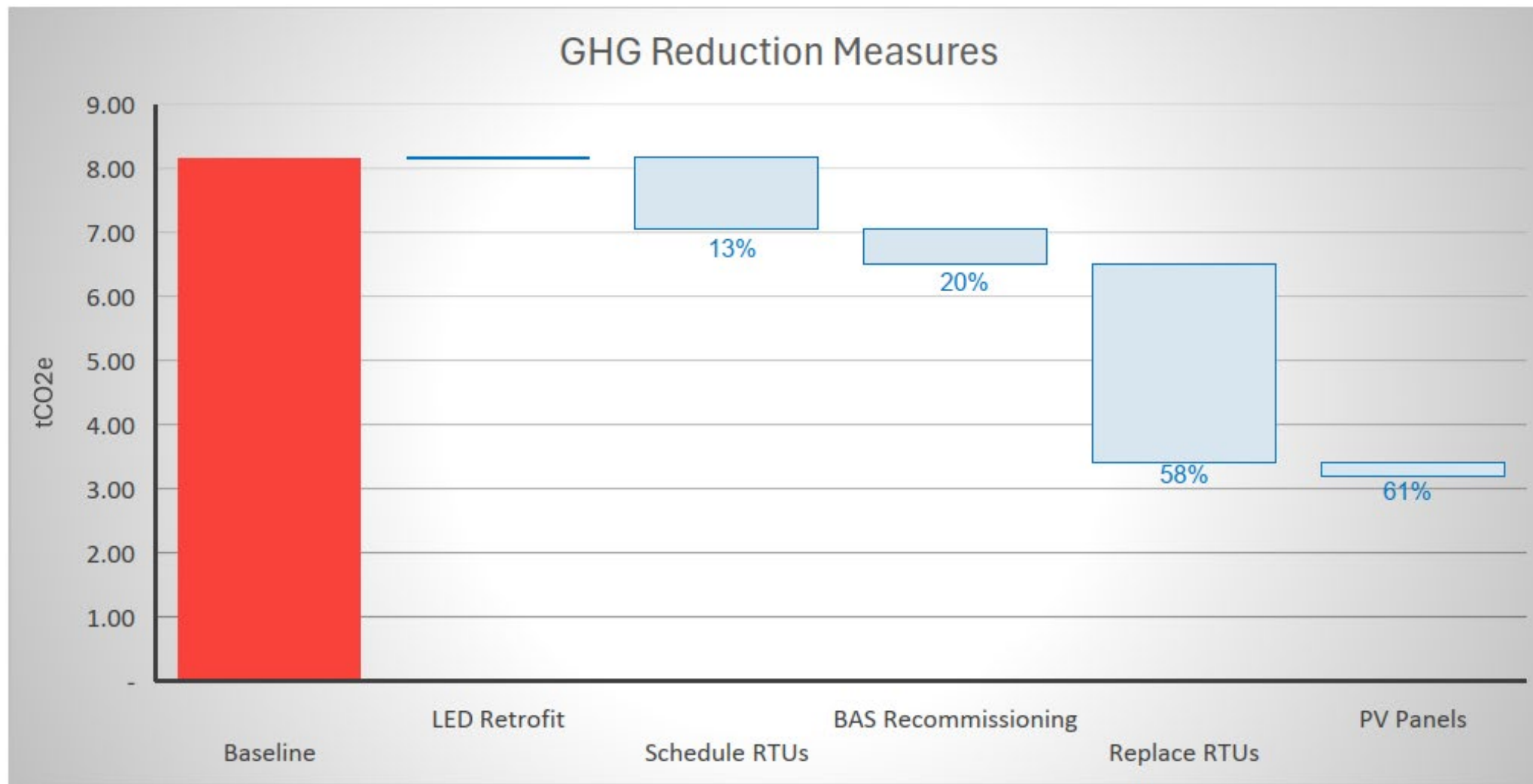
Energy Conservation Measures

- LED Lighting Retrofit
- Modify RTU Schedules
- BAS Recommissioning

GHG Reduction Strategies

- Replace RTUs with All Electric Heat Pumps
- Install PV Panels

GHG Reduction Pathway



Public Works – Summary



NAME AND ADDRESS	PUBLIC WORKS / PUBLIC WORKS YARD BUILDING – 601 CANTEEN ROAD, ESQUIMALT, BC V9A 3R2
Gross Floor Area	1,150 m2
Year Constructed	1996
Number of Levels	1 Storey, Large maintenance garage, Woodwork shop, Metal shop, Storage sheds, Washrooms, change rooms, offices
Cladding	The exterior walls are metal siding with some exposed concrete walls.
Parking	Surface
Current Occupancy	Full
Building Usage	Maintenance functions

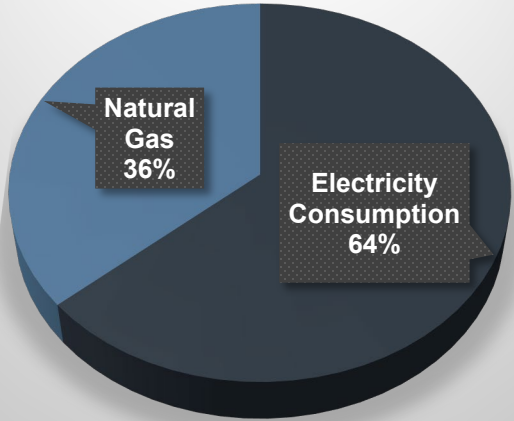


Public Works – Summary of Utilities

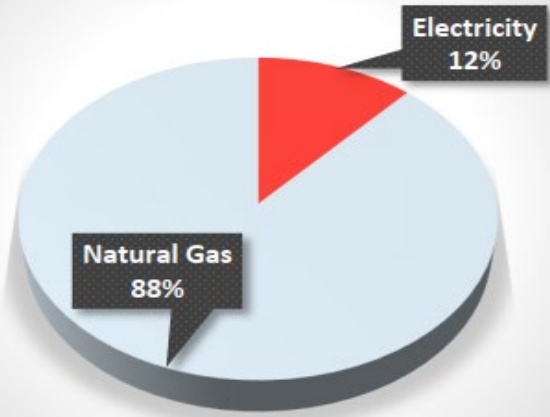
Baseline Data (May 2024 - April 2025)

Utility	Consumption		Equivalent Consumption		% of Total Energy	Rate		Cost	Energy Use Intensity (ekWh/ft ²)
Electricity Consumption	143,467	kWh	143,467	kWh	64%	0.1080	\$/kWh	\$15,494	11.59
Electricity Demand	460	kW				6.03	\$/kW/mo	\$2,774	
Natural Gas	294	GJ	81,767	ekWh	36%	8.80	\$/GJ	\$2,590	6.61
Water	1,477	m ³				1.87	\$/m3	\$2,764	
Total Equiv. Energy Consumption			225,234	ekWh	100%	Total Cost		\$23,623	18.20

Energy Usage Breakdown



GHG Emissions Breakdown



Expected Major Capital Renewal

- Upcoming Renewals due to end of service life
 - Complete LED Retrofit

Capital Renewal History

- Partial LED Retrofit (2023)
- Replaced East Office Heat Pumps (2019)
- Replaced West Office Heat Pumps (2012)

Proposed Measures

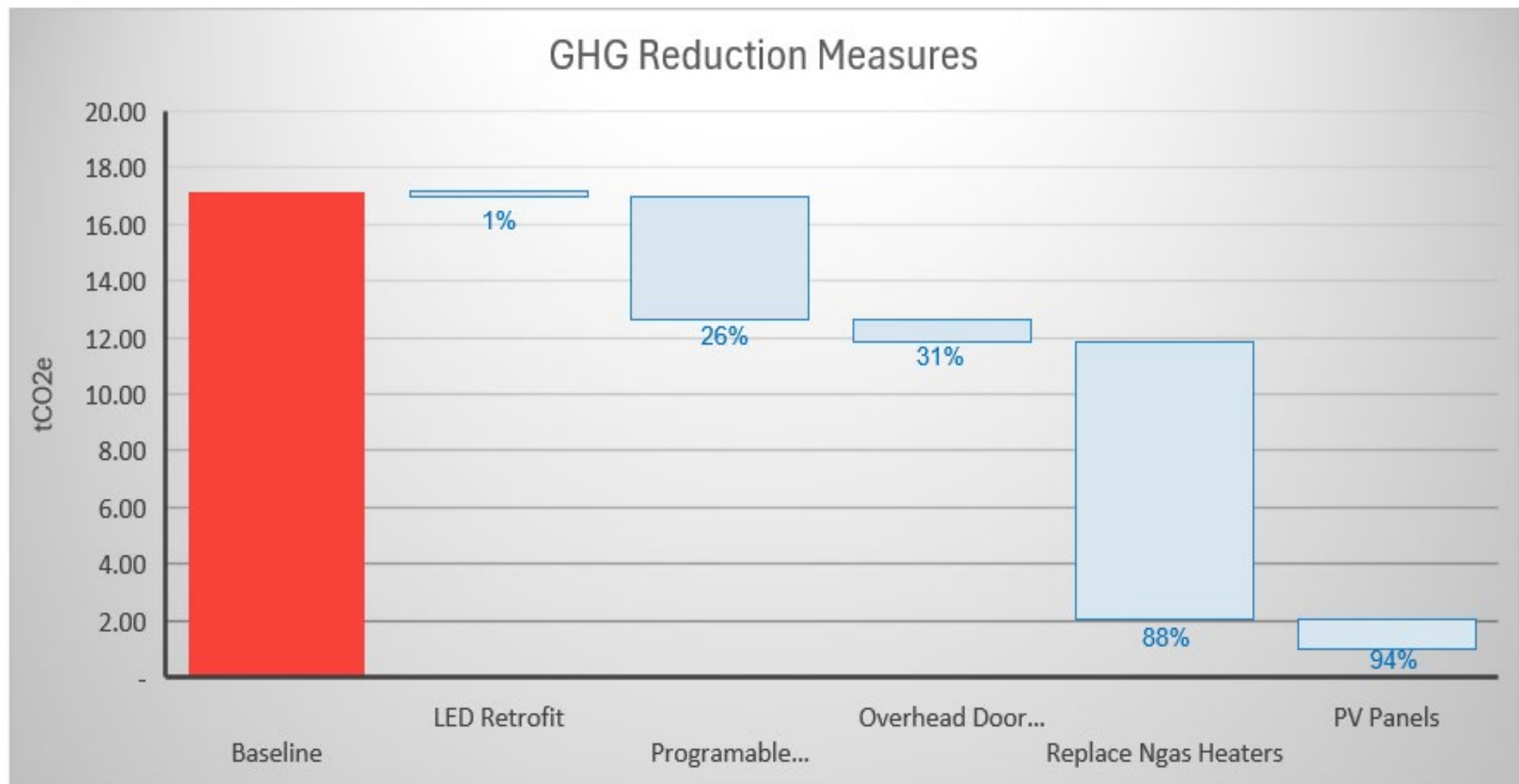
Energy Conservation Measures

- LED Lighting Retrofit
- Install Programmable Thermostats
- Overhead Door to Heater Interlock

GHG Reduction Strategies

- Replace Natural Gas Heaters with Electric
- Install PV Panels

GHG Reduction Pathway



Parks Nursery – Summary

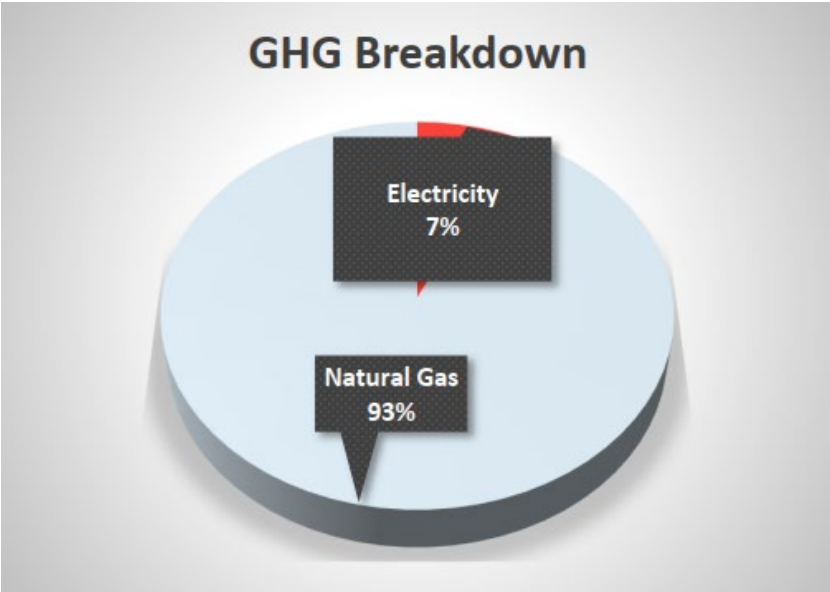
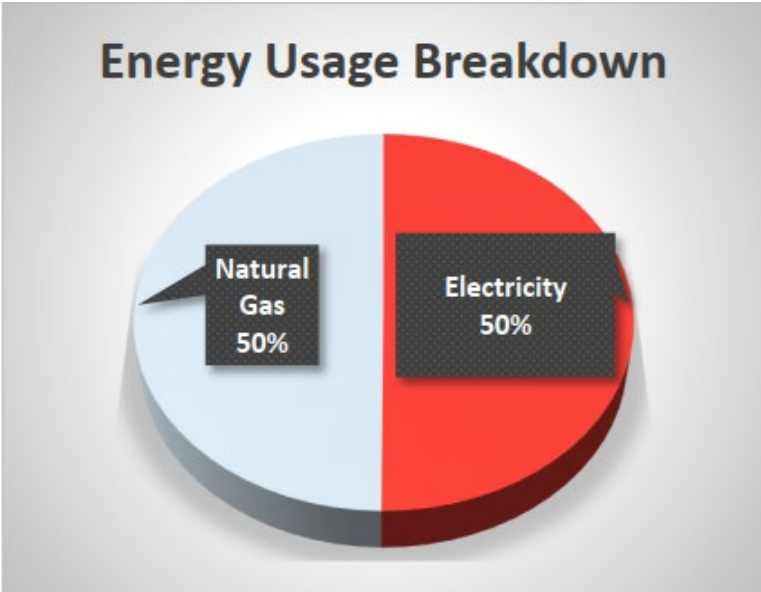


NAME AND ADDRESS	PARKS NURSERY BUILDING - 1100 CRAIGFLOWER ROAD, ESQUIMALT, BC V9A 2Y1
Gross Floor Area	223 m ²
Year Constructed	1979
Number of Levels	Two stories
Cladding	The exterior walls are finished with face-sealed stucco cladding, with exterior wood trim.
Parking	Above-ground parking is available surrounding the facility.
Current Occupancy	Normally 1-2 employees, other staff are in and out. An additional 8 auxiliaries in peak season.
Building Usage	Offices, workshops, storage, greenhouse and electric vehicle charging (new in 2025)



Parks Nursery – Summary of Utilities

Baseline Data 2023										
Utility	Consumption		Equivalent Consumption		% of total energy	Rate		Cost	Energy Use Intensity (ekWh/ft ²)	
Electricity	29,868	kWh	29,868	kWh	50%	0.1363	\$/kWh	\$4,073	12.45	
Natural Gas	107	GJ	29,722	ekWh	50%	8.80	\$/GJ	\$942	12.39	
Total			59,591	ekWh	100%			\$5,014	24.83	



Expected Major Capital Renewal

- Upcoming Renewals due to end of service life
 - Replace First Floor Furnace (2026)
 - Replace Windows (2026)
 - Replace Flat Roof (2030)

Capital Renewal History

- Replaced 2nd Floor Furnace with Heat Pump (Sep 2025)
- Installed new PV Panels (Nov 2025)
- Installed four EV Charging Stations (2025)
- Replaced two windows on North side (2022/2025)



Proposed Measures

1. Energy Conservation Measures

- LED lighting retrofit.
- Install programable thermostats.

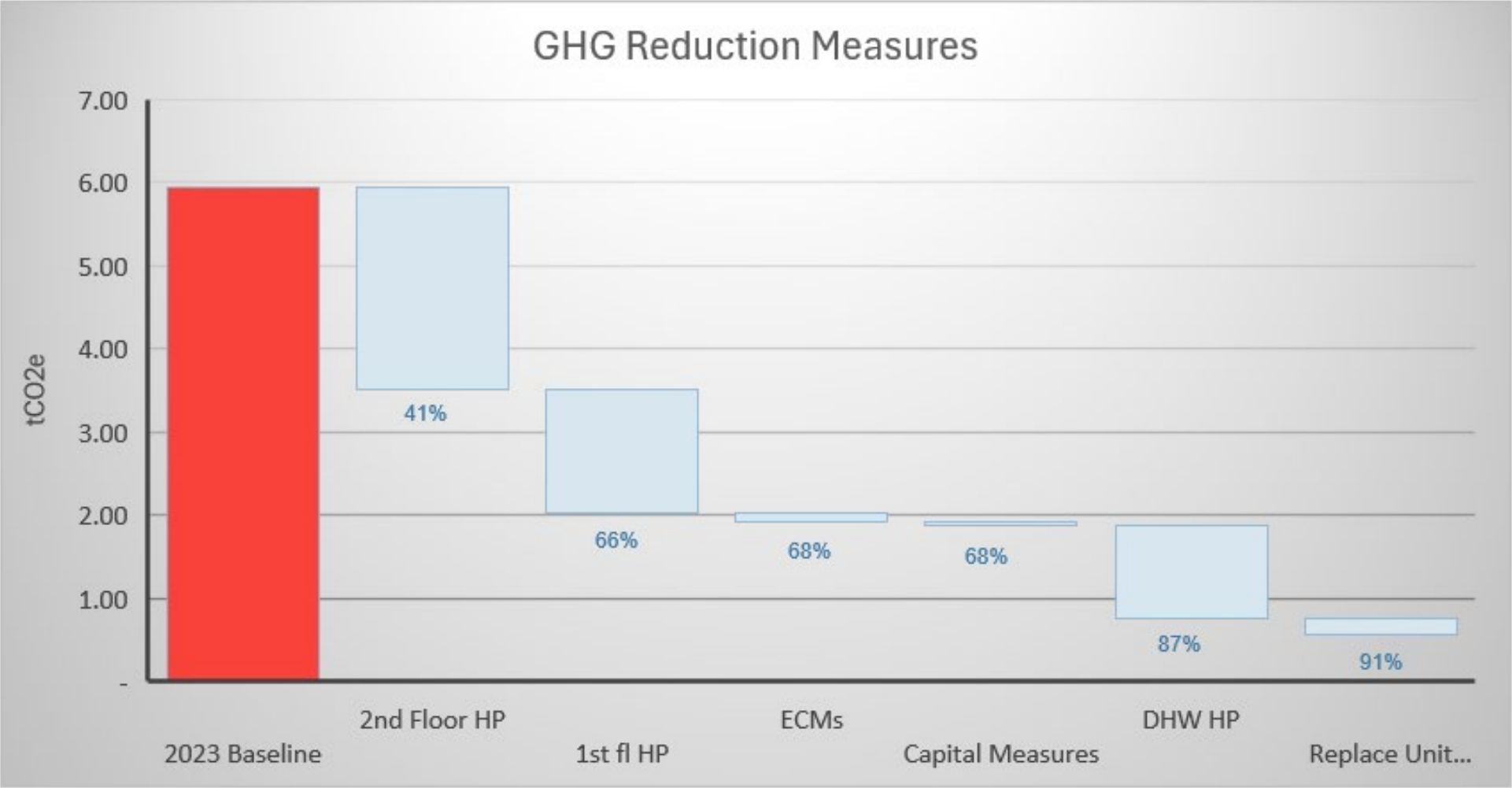
2. Capital Measures

- Window replacement.
- Roof replacement.

3. GHG Reduction Strategies

- Replace 1st floor furnace with a heat pump
- Replace natural gas DHW heater with electric
- Replace greenhouse natural gas unit heaters with electric

GHG Reduction Pathway





Thank you



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