

Decarb Lunch Series

zebex

Productive Disruption: Virtual Decarbonization Planning

cleanBC

Fri Jan 26, 2024,
from 12- 1pm PST
Free Webinar | zebex.org

zeic

ZERO EMISSIONS INNOVATION CENTRE

MORE SOLUTIONS, LESS CARBON.

The logo for zebo x, featuring the word "zebo" in orange lowercase letters and "x" in grey lowercase letters.

Looking to learn more about building decarbonization?
[Check out our resources.](#)



Looking to help advance building electrification?
[Join the industry coalition.](#)



Looking to reduce embodied emissions?
[Check out our offerings.](#)



Looking to get paid to help us answer timely research questions?
[Check out if you qualify.](#)



RESOURCES

ZEBx TV

EVENTS

NEWS

ABOUT

ZEIC

CONTACT US



Subscribe

NearZero: Reaching the Top Step

Watch Later Share

REACHING THE TOP STEP

Presented By: **zebx** **cleanBC**

Watch on YouTube

NearZero: Reaching the Top Step

How are homeowners, builders and designers already reaching the highest step of emission reduction requirements? We found some of them from ZEBx's NearZero program, listen to them here.

Overview

Playbooks & Winners

Is BC Ready for Electrification? B2E w BC Hydro, Sep 2023

Watch Later Share

B2E Webinar **BC Hydro Power smart**

Is BC Ready for Electrification?

Watch the Event Recorded Sep 29, 2023

Watch on YouTube

Is BC Ready for Electrification? B2E w BC Hydro, Sep 2023

B2E, a program alongside ZEBx and part of the ZEIC family, collaborated with BC Hydro in Sep 2023 to help answer the question 'Is BC Ready for Electrification?'

Overview

B2E Resources

Life Cycle Assess...

Climati chan...

Life Cycle Assessment Process to Estimate Embodied Carbon in Buildings

From ZEBx's Net-Zero Energy-Ready Playbook Series

Overview

Read This Playbook

Planning Airtight ...

Planning Airtight Buildings

From ZEBx's Net-Zero Energy-Ready Playbook Series

Overview

Read This Playbook



POLL 1

Tell us about yourself!

Three-part anonymous poll



February 14 & 15, 2024

Vancouver Convention Centre West



**Celebrating 35 Years of
Connecting Western Canada's
Building & Construction Industries**

@buildingscanada
#buildexvancouver
www.buildexvancouver.com

Register Now!

BC EMBODIED CARBON AWARDS 2024

Submission deadline

February 5, 2024

**10 DAYS
TO GO**

&

Celebrate on April 18, 2024 from 5pm

Ticket includes entry and canapés

Ventura Room

695 Cambie St

Vancouver, BC

V6B 0K9



Carbon
Leadership
Forum
British
Columbia

Powered by **zeic**

zebx

ZERO EMISSIONS BUILDING EXCHANGE

Powered by **zeic**

Working to rapidly accelerate the knowledge, capacity and passion for zero-emissions buildings in Vancouver and British Columbia

Industry
Resources

Events &
Demonstrations

Specialized
Programming

[Learn More About ZEBx](#)



Kelly Court – Full Building Envelope Rehabilitation 2022

Decarbonization Plans – Affordable Housing

DEVELOPING PLANS QUICKLY AND COST EFFECTIVELY

Jade Hume, P.Eng, PMP

Division Manager, Housing - Capital Maintenance and Development

January 26, 2024

Orbit

metrovancouver

Metro Vancouver Housing Portfolio

67%
TOWNHOMES

33%
APARTMENT
BUILDINGS

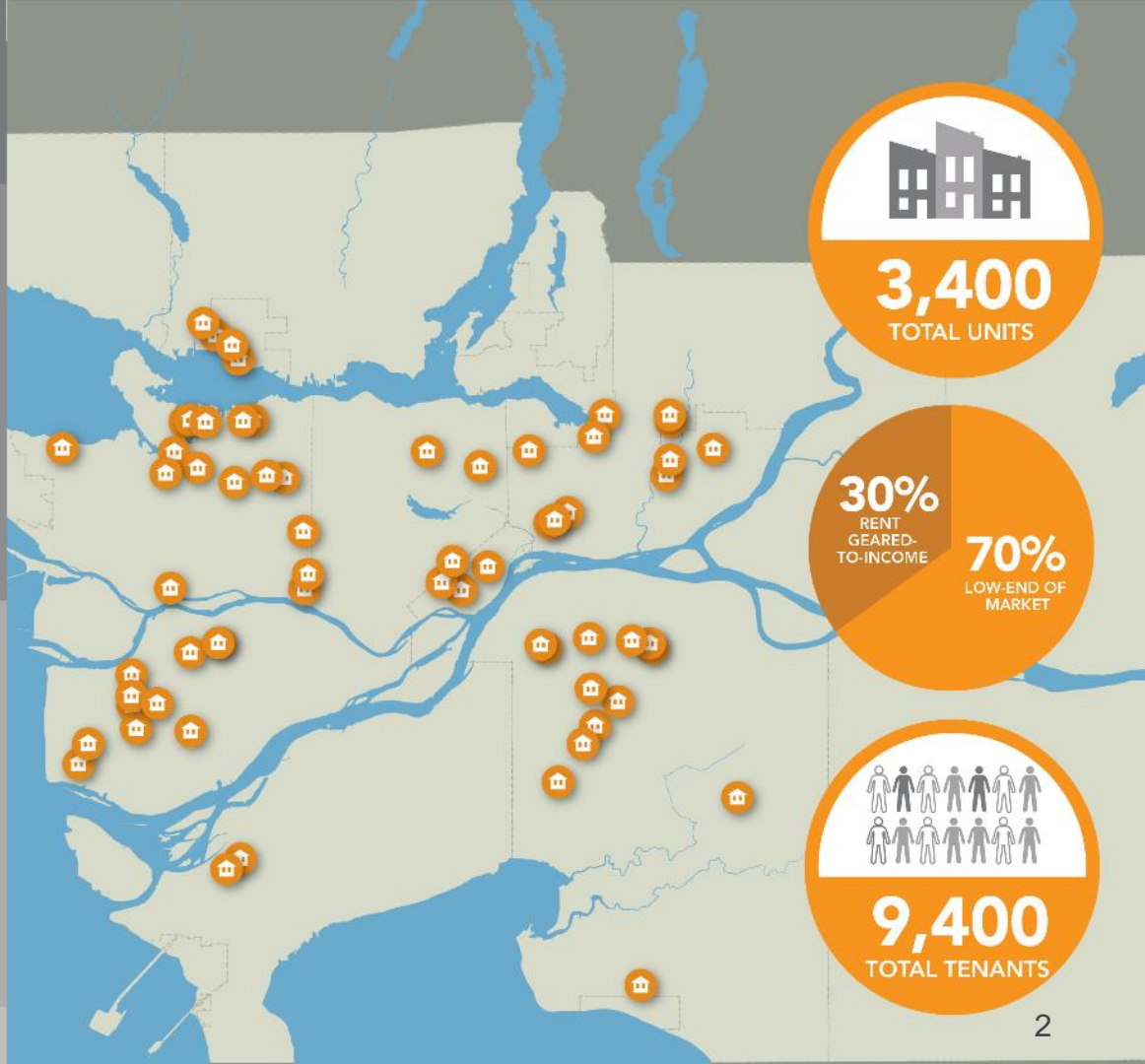
metrovancover

0 – 1 BDRM
18%

2 BDRM
41%

3 BDRM
40%

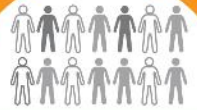
4 BDRM 1%



3,400
TOTAL UNITS

30%
RENT
GEARED-
TO-INCOME

70%
LOW-END OF
MARKET

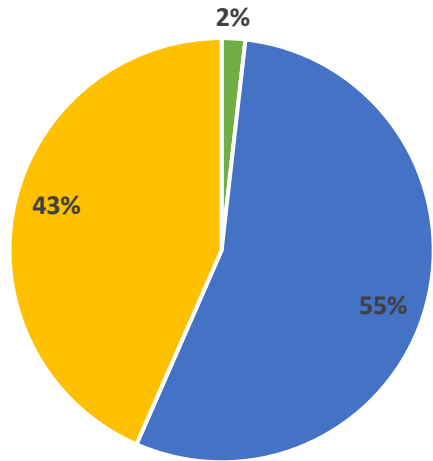


9,400
TOTAL TENANTS

HOUSING ENERGY AND GREENHOUSE GAS (GHG) 2021 DATA

Housing Energy Costs (\$)

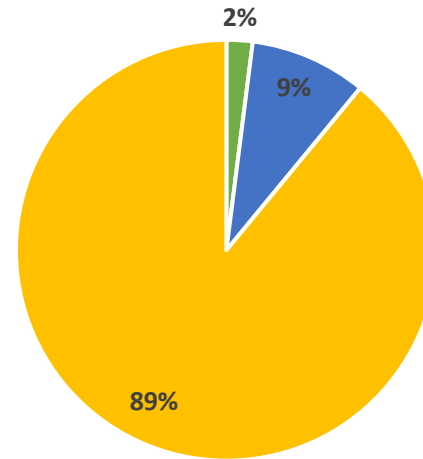
■ Steam ■ Electricity ■ Natural Gas



Total Energy Costs: \$1.27 million

Housing GHG Energy Emissions (tCO₂e)

■ Steam ■ Electricity ■ Natural Gas



Total GHG Emissions: 2440 tCO₂e

2019 METRO VANCOUVER HOUSING 10-YEAR PLAN

Targets

🎯 Mixed-income

Maintain at least 30% of our portfolio as Rent-Geared-to-Income to support a range of affordability needs and ensure long-term financial sustainability.

🎯 Diverse housing types

Maintain at least 70% of portfolio as 2-bedroom units or larger to support family-friendly housing and provide a mix of unit sizes to allow flexibility and suit a range of needs.

🎯 Energy Efficient

Reduce energy consumption by 25% for major rehabilitations, such as building envelope upgrades, and for new construction (from 2015 National Energy Code for Buildings).



🎯 Low emission

Reduce GHG emissions in housing portfolio by 45% (from 2010 levels) over the next 10 years to work towards the region's goal of being carbon neutral by 2050.

🎯 Well-maintained

Maintain a portfolio-wide Facility Condition Index at or below 20% over the next 10 years to support safe and healthy homes for existing tenants.

🎯 Age-friendly

Work towards 20% of units as adaptable or fully accessible to support people of all ages and abilities.

🎯 Growth

Increase housing portfolio with 1,350 new and redeveloped units approved over the next 10 years.

ADDITIONAL BENEFITS TO DECARBONIZATION PROJECTS

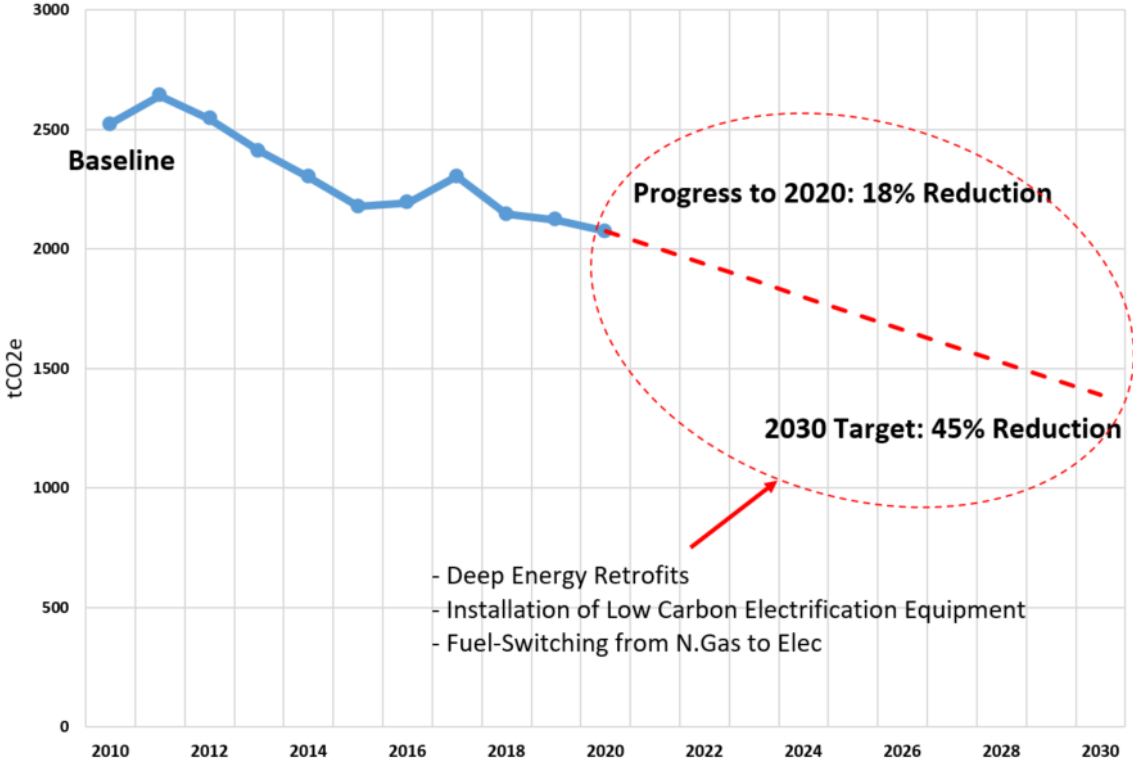
- MVH 10 Year Plan - Targets
- Maintain Quality, Safe Homes
- Improve Tenant Comfort
- Enhance Sustainability
- Maintain Deeper Affordability
- Provide new building life cycle
- Reduce Energy Use
- Tenant Engagement & Collaboration



Evergreen Downs

REDUCING GHG EMISSIONS

Metro Vancouver Housing GHG Emissions

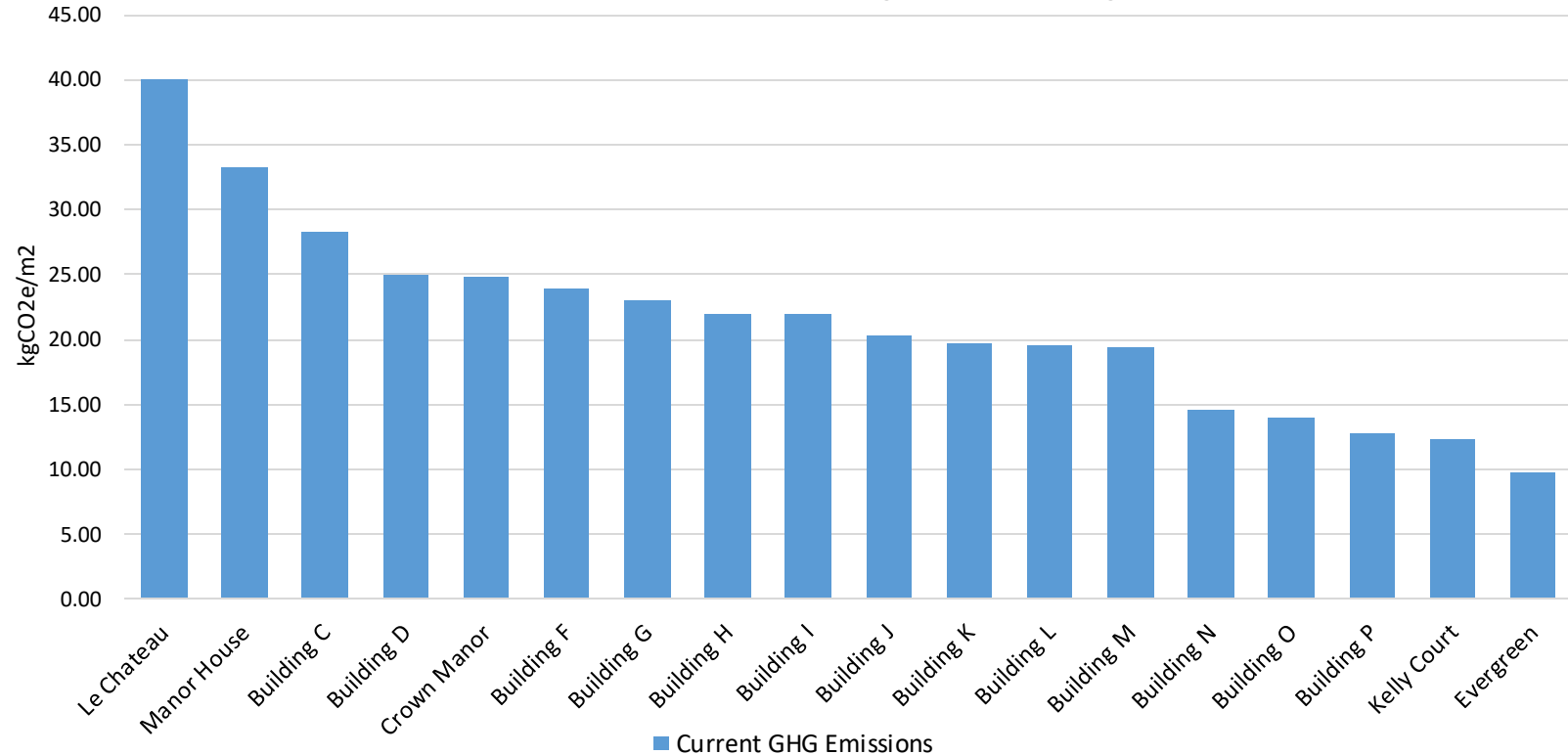


Low emission

Reduce GHG emissions in housing portfolio by 45% (from 2010 levels) over the next 10 years to work towards the region's goal of being carbon neutral by 2050.

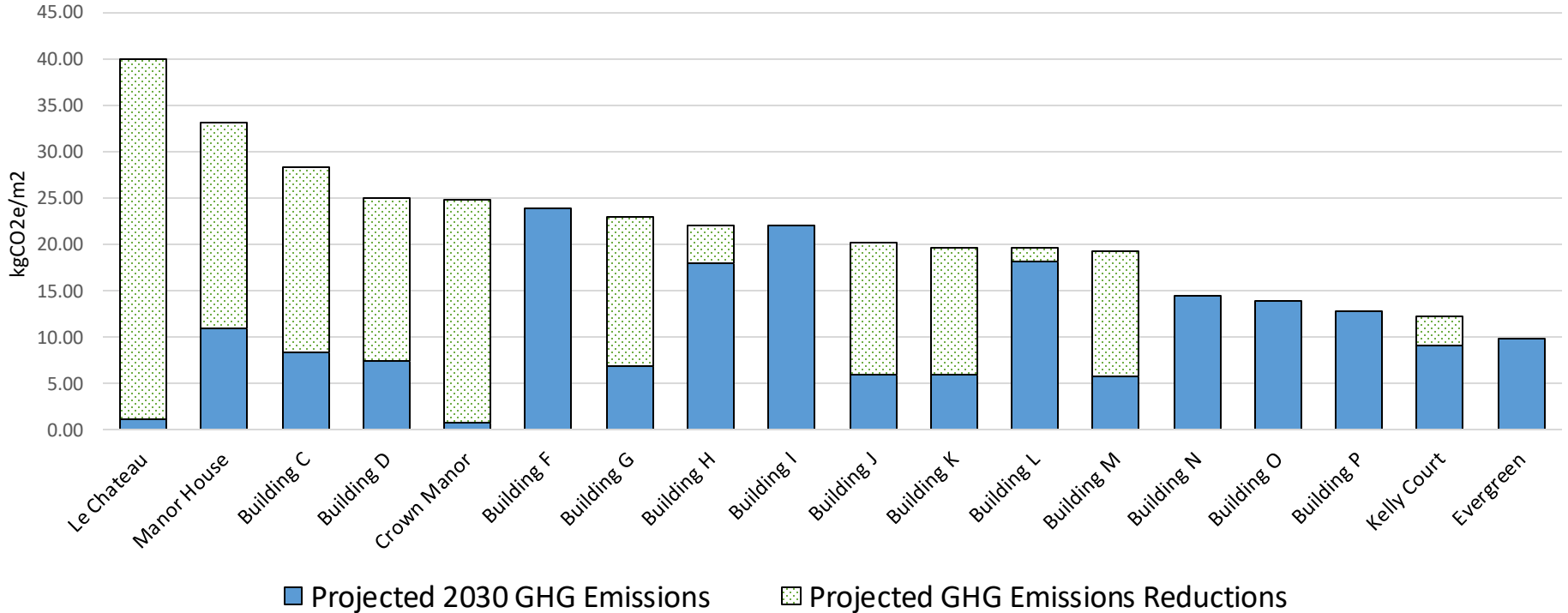
2021 MVH BUILDING BENCHMARKING

MVH GHG Emissions Building Benchmarking



PROJECTED 2030 BUILDING BENCHMARKING

Projected 2030 MVHC Building GHG Emissions



ZEBX DECARB LUNCH

JANUARY 26, 2024

Decarbonization Planning

Brittany Coughlin | MAsC, P.Eng., BEMP, CPHC
RDH Building Science Inc.

Project Examples

- Energy Study
- Zero Carbon Over Time
- Climate Needs Assessment
- Portfolio Planning
- Deep Retrofit Implementation

Energy Study



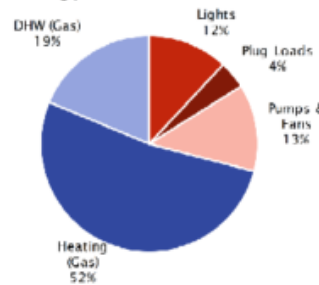
ENERGY PERFORMANCE: BUILDING UPGRADES

EXISTING END-USE BREAKDOWN

The proposed upgrades for are focused on the building enclosure, and include new windows and exterior wall insulation. These upgrades will predominantly impact the natural gas space heating energy, which represents approximately 52% of the existing building energy consumption as shown in the below figure.

In addition, suite-level energy recovery ventilation units (ERVs) and a district heating system are also modelled to demonstrate the building energy performance that is achievable when efficiency building systems are used in conjunction with a high performance enclosure.

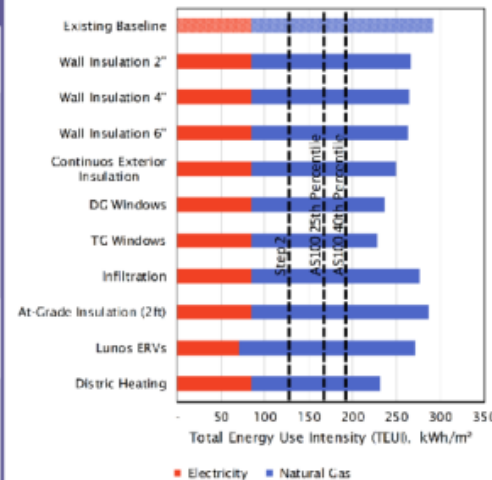
Energy End-Use Breakdown



ENERGY CONSERVATION MEASURES

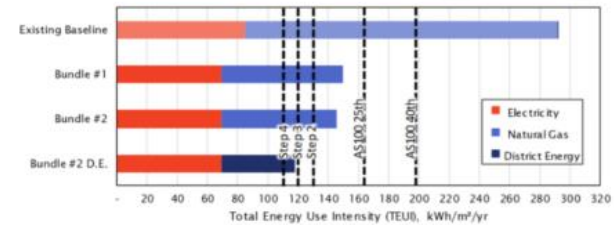
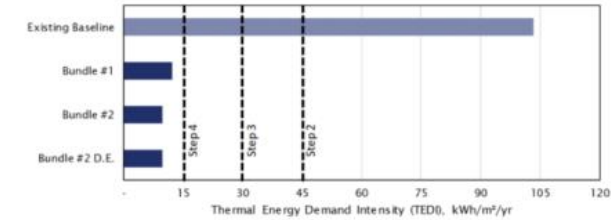
The proposed energy conservation measures (ECMs) are presented visually, and summarized in Table 4. 'Existing Baseline' shows the current (existing building) energy consumption when simulating McTaggart-Cowan Hall under typical weather conditions.

Table 4: Energy Conservation Measures			
Energy Conservation Measures (ECMs)	TEDI (kWh/m ² /yr) (% Reduction)	TEUI (kWh/m ² /yr) (% Reduction)	GHGI (kgCO ₂ /m ² /yr) (% Reduction)
Wall Insulation			
→ Add 2" Exterior MW insulation	84 (19%)	266 (9%)	37 (12%)
→ Add 4" Exterior MW insulation	83 (20%)	264 (9%)	37 (13%)
→ Add 6" Exterior MW insulation	82 (21%)	263 (10%)	37 (13%)
Continuous Exterior Insulation			
Increase Roof Assembly to R-30, Decks to R-20, and Walls to R-18	71 (31%)	249 (14%)	34 (20%)
Windows			
Replace existing windows with:			
→ DG windows with low conductivity frames, U-0.25	62 (40%)	237 (19%)	31 (26%)
→ TG windows with low conductivity frames, U-0.14	55 (46%)	228 (22%)	30 (30%)
At-Grade Exterior Insulation			
4" Insulation for 2ft below grade	101 (3%)	287 (1%)	42 (3%)
Lunos ERVs			
1 ERV per dorm room & reduce central ERV airflow to night-time levels (65% design flowrate)	98 (5%)	271 (7%)	41 (3%)
Airtightness			
Reduce infiltration by 50%, to 0.125 L/s/m ²	91 (12%)	276 (5%)	39 (7%)
District Heating			
District energy for DHW and heating	103 (0%)	232 (20%)	Insufficient data

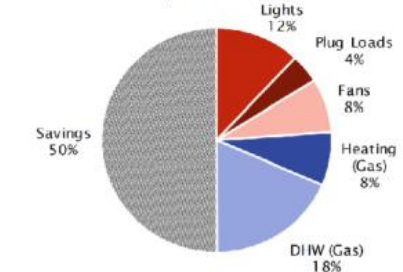


Based on the energy savings achieved by the individual ECMs presented above, RDH recommends the following bundle of building enclosure ECMs for this phase of work:

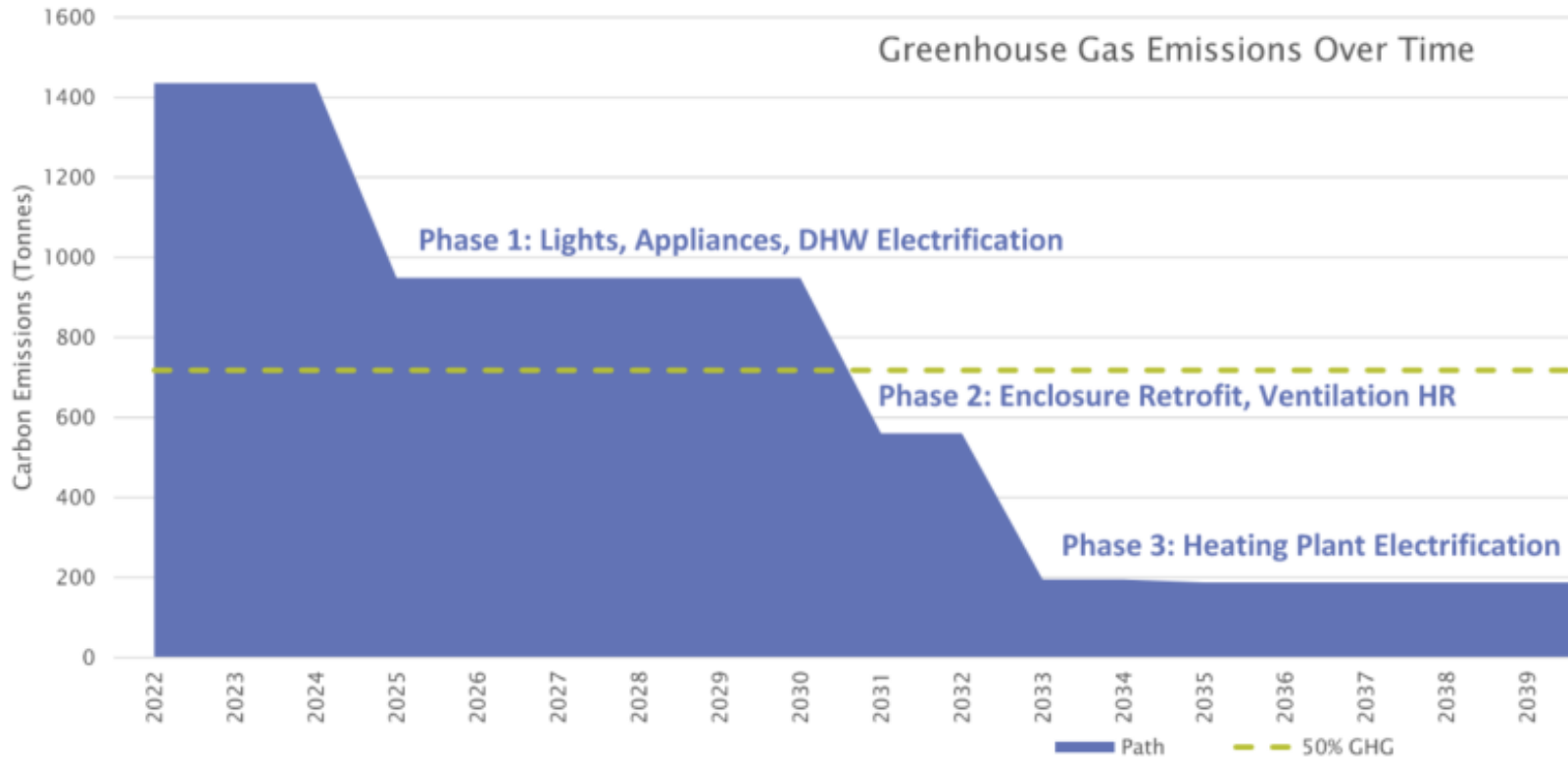
- Add minimum 4" of exterior mineral wool insulation to above grade wall assemblies, with a focus on air barrier detailing for improved airtightness.
- Add continuous exterior insulation the roof, decks and bay windows.
- Add at-grade insulation, extending 2' below grade.
- Replace existing windows with new triple glazed windows in low-conductivity frames, targeting a U-value of U-0.14.
- Add ERVs to dorm rooms, and reduce central HRV flowrate
- Transition heating and DHW to district heating



End-Use Breakdown With Upgrades (Bundle #1)



Zero Carbon Over Time



Zero Carbon Over Time






RETROFIT PATH NET ZERO CARBON BY 2050	Last Renewal	Service Life	Upgrade cycle:												INCREMENTAL COST 2023 Current Year Dollars			
			1975 - 1980	1980 - 1985	1985 - 1990	1990 - 1995	1995 - 2000	2000 - 2005	2005 - 2010	2010 - 2015	2015 - 2020	2020 - 2025	2025 - 2030	2030 - 2035		2035 - 2040	2040 - 2045	2045 - 2050
Plan: Garage Repairs or Waterproofing (2023-2025)	2007	20										X						\$3,650,000
RDH CRM02: Parking Garage Soffit Insulation Retrofit (align with Base Garage Repairs)	1980	75										X						\$280,000
RDH CRM06: DHW Consumption - Low Flow Shower and Faucet Fixture Retrofit (ongoing)	2006	50										X						\$28,000
RDH CRM07: Electrical Fixtures - High-Efficiency Lighting & Appliance Retrofit (ongoing)	2006	20										X						\$280,000
Electrical Transformer and Switchboard Replacment (Electrical Capacity Upgrade)												X						\$800,000
RDH CRM09: DHW Plant - Replace Gas DHW Heaters with Heat Recovery Heat Pump	2008	15										X						\$1,500,000
RDH CRM01: Exterior Walls - Exterior Insulation Retrofit, including base building brick/concrete repairs and new balcony guards (Opt 1 cost) + RDH CRM03: Window and Balcony Door Replacement as Combined Project	2005	75												X				\$15,000,000
Plan: Concrete Balcony Repairs, but move to align with CRM01/03 wall/window project	2006	30												X				\$1,000,000
RDH CRM05: Ventilation - Suite & Corridor Ventilation Heat Recovery Retrofit	1978	50												X				\$6,200,000
RDH CRM08: Heating Plant - Replace Gas Boilers with Electric Heat Pump	2008	25												X				\$2,500,000
RDH CRM04: Roof - Main Roof Replacement	2018	25													X			\$1,550,000
RDH CRM10: Renewable Energy - Building and Site-Based Solar Photovoltaic Installation	-	20														X		240,000
TOTAL RETROFIT PATH COST																	\$33,028,000	

Climate Needs Assessment

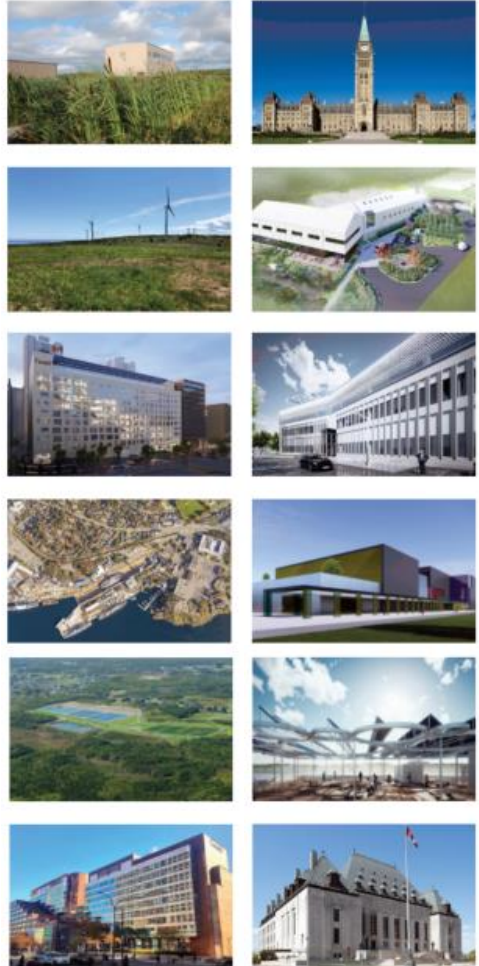
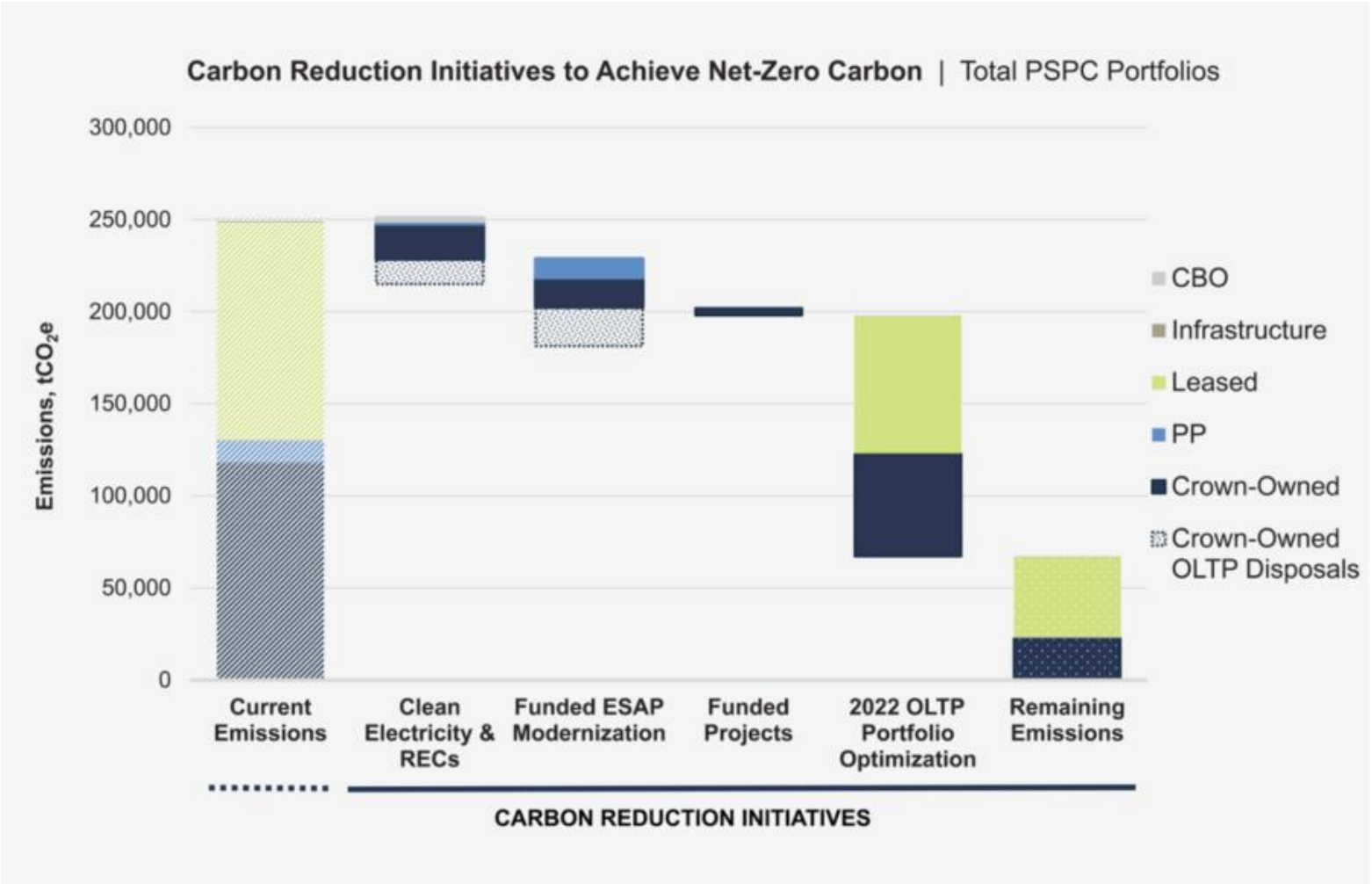


CLIMATE HAZARDS AND VULNERABILITIES TO BUILDINGS

The following outlines the most prevalent hazards that exist now for buildings, which are only expected to increase over time due to climate change. Buildings with vulnerabilities could lead to serious potential consequences if the likelihood of hazards and exposure are also high for the building.

HAZARD	DESCRIPTION	BUILDING VULNERABILITIES
 WARMING AND EXTREME HEAT EVENTS	Increased Average Outdoor Air Temperatures	<ul style="list-style-type: none"> High window to wall ratios Minimal exterior shading of window systems Poor performing windows High internal heat gains from equipment Low ventilation or no operable windows No active cooling or insufficient capacity
	Increased Severity and Frequency of Heat Waves	
	Increased Humidity	
 WILDFIRES	Increased Severity and Frequency of Wildfires	<ul style="list-style-type: none"> No filtration in ventilation systems Reliance on natural ventilation for cooling Combustible building materials and cladding Dry landscaping
	Increased Severity and Frequency of Smoke and Air Contaminants	
 FLOODING	Riverine Flood - extreme water levels from inland water sources	<ul style="list-style-type: none"> Insufficient waterproofing of living spaces and first to flood areas Unprotected mechanical, electrical systems located in first to flood areas Existing podium leak issues Elevator operations equipment below flood level Undersized or no sump pump
	Pluvial Flood - extreme water levels from rainfall	
	Coastal flooding - increased water levels from sea rise, storm surges and wave effects	
 EXTREME STORMS	Extreme winds	<ul style="list-style-type: none"> Existing water leak issues or deteriorating roof components Building features that may accumulate snow or ice No backup systems or power generation Existing condensation issues Poor performing enclosure
	Heavy rain, hail or snow	
	Freezing Rain	
	Ice Storms and Cold Snaps	
 DROUGHTS	Increased severity and frequency of dry spells and droughts	<ul style="list-style-type: none"> Non-drought tolerant landscaping

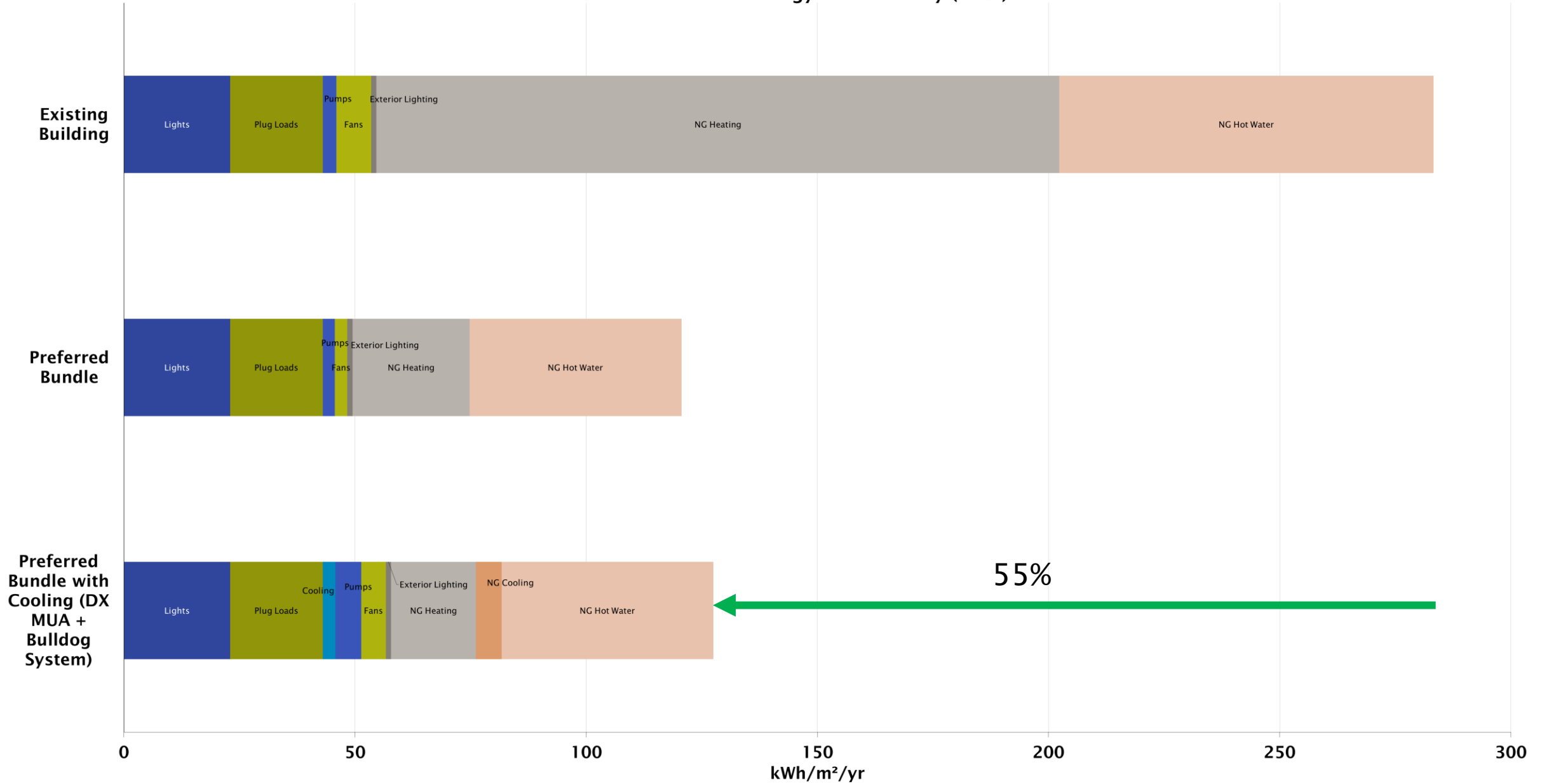
Portfolio Planning



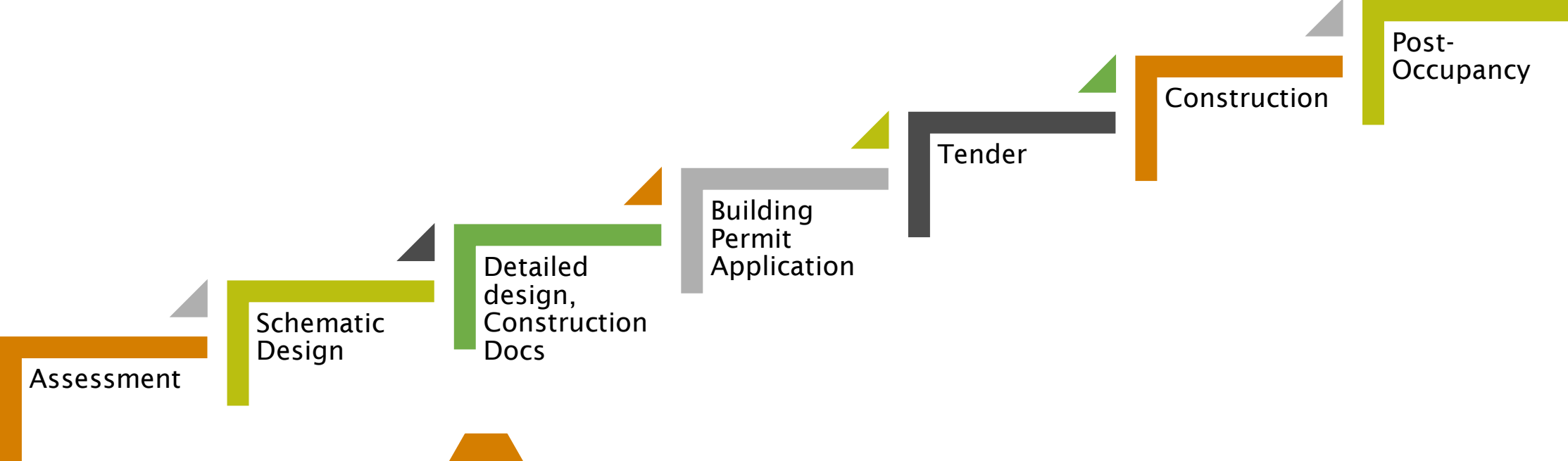
Deep Retrofit Project - Implementation



Total Energy Use Intensity (TEUI)



Complexity: Process



Discussion + Questions

bcoughlin@rdh.com

Learn more at

rdh.com



RDH Building Science



@RDHBuildings

Learn More

RDH Technical Library

Building enclosure articles, conference papers, presentations, research reports, quick guides + technical bulletins

rdh.com/technical-library



Learn Building Science

Live events, guides, courses + more!

learnbuildingscience.com

The logo for Open Technologies features the word "open" in a stylized, lowercase, sans-serif font. The letter "o" is a solid circle, while the "p" is a vertical bar with a small horizontal tick at its base. The "e" is a simple, rounded shape. The word "Technologies" is written in a smaller, clean, uppercase sans-serif font directly below "open".

open
Technologies

OPEN Technologies' software tools help the people shaping our cities to make pro-climate decisions with confidence

For governments, capital providers, and property owners, we build targeted information assets to drive policy, incentives, and capital

We work with amazing organizations

We have strong coverage across Canada, with a presence in most major cities—and a foothold in the US.



● British Columbia

BC Housing
BC Hydro
Capilano Regional District
City of Abbotsford
City of Burnaby
City of Kamloops
City of Kelowna
City of Nanaimo
City of New Westminster

City of Port Moody
City of Richmond
City of Surrey
City of Vancouver
City of Victoria
City of West Vancouver
City of Whistler
District of Saanich
District of North Vancouver

North Vancouver City
Metro Vancouver
Province of British Columbia
Township of Esquimalt
Township of Langley
University of British Columbia
Vancity Credit Union

● Alberta

City of Edmonton
City of Calgary

● Saskatchewan

City of Saskatoon

● Ottawa, ON

Natural Resources Canada
CMHC
City of Ottawa

● Quebec

City of Montreal

● Nova Scotia

Efficiency Nova Scotia

● Houston, TX

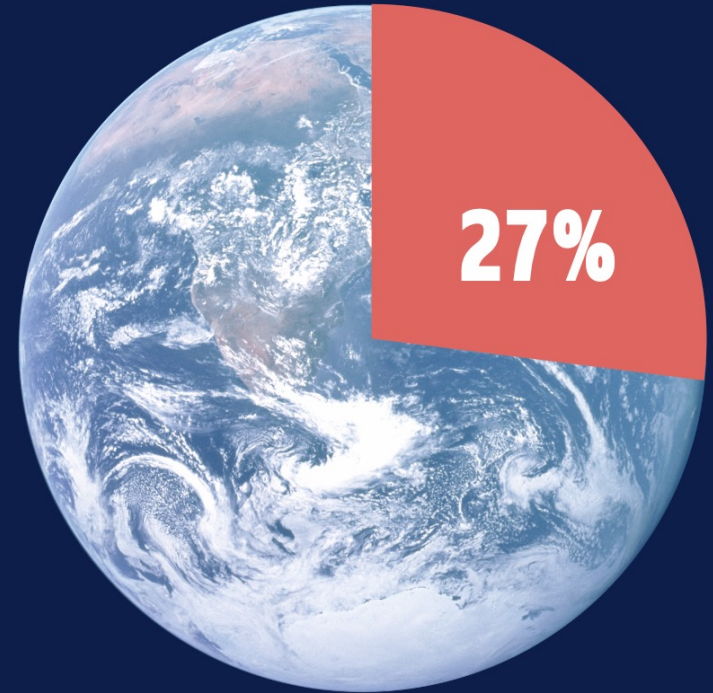
Hines

● Davidson, NC


Trane

THE PROBLEM

**Building operations
are responsible for
over 1/4 of annual
global emissions.***



SOURCE: [ARCHITECTURE 2030](#)



Governments, capital providers, and owners are joining the drive to decarbonize our new and existing buildings.

According to the IPCC, buildings around the world must reach net zero emissions within a few decades.

To keep the planet livable, a growing coalition of countries, cities, businesses and other institutions are pledging to get to net zero emissions. More than 140 countries, 9,000 companies, 1000 cities, 1000 educational institutions, and 600 financial institutions have committed to halve emissions by 2030.*

20%

20% of existing buildings must be retrofitted to a zero-carbon-ready level by 2030 to reach net zero by 2050*

SOURCE: [UN](#) AND [IEA](#)

Good building performance data is needed to make this happen, but traditional methods are **expensive and slow.**

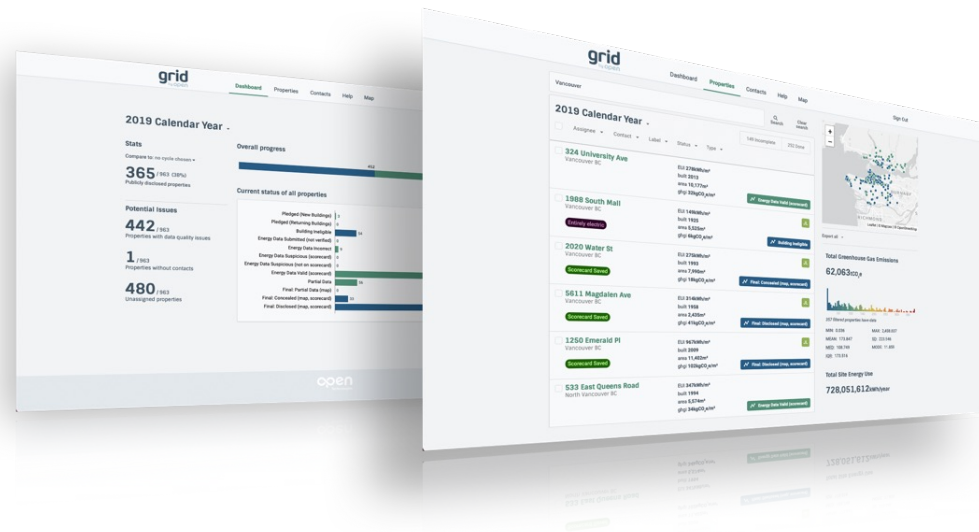
THE TRADITIONAL METHOD

Traditional energy audits involve hiring an engineering consultant to visit the building, gather data, and feed it into their spreadsheets or traditional models. These models are huge

and slow to run, taking days to generate insights. In all, these audits cost ~\$20k and take 3-4 weeks weeks per building.

Good building data—for one building, or many—is increasingly needed for decarbonization, access to capital, reporting, and asset management.

GRID



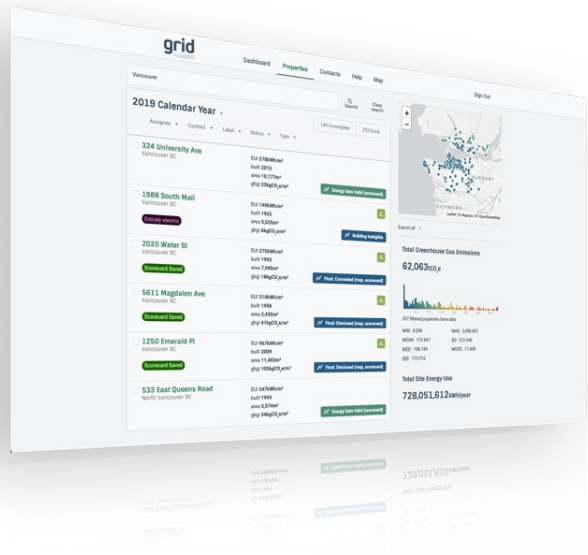
Canada's industry leader in energy and emissions tracking, reporting, and analytics, GRID informs policy development, incentive-program design, and capital deployment for green building intervention.

Partially Funded by
Natural Resources
Canada

Financé partiellement par
Ressources naturelles
Canada



What is GRID?



1. A customer relationship management (CRM) interface which:

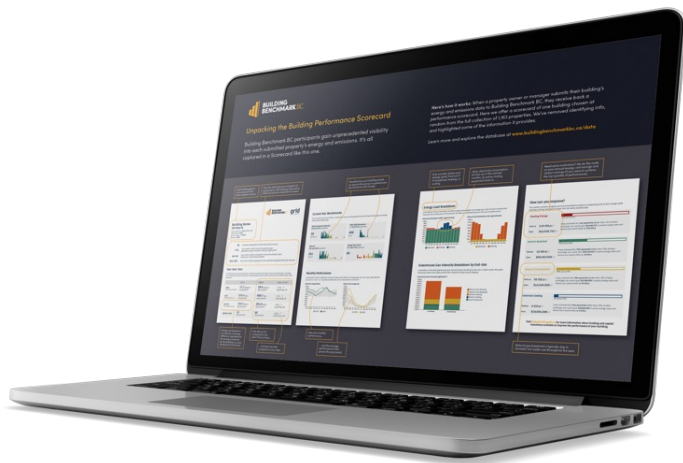
- Manages data collection & cleaning
- Manages shifting relationships with building contacts and owners, including the assignment of an internal user to each property; and
- Generates performance reports at a building or portfolio level

What is GRID?



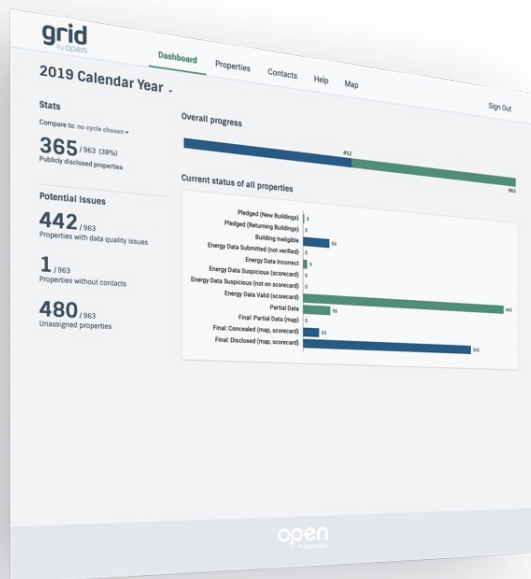
1. A customer relationship management (CRM) interface which:
 - Manages data collection & cleaning
 - Manages shifting relationships with building contacts and owners, including the assignment of an internal user to each property; and
 - Generates performance reports at a building or portfolio level
2. A map-based data visualization interface for public disclosure of program performance

What is GRID?



1. A customer relationship management (CRM) interface which:
 - Manages data collection & cleaning
 - Manages shifting relationships with building contacts and owners, including the assignment of an internal user to each property; and
 - Generates performance reports at a building or portfolio level
2. A map-based data visualization interface for public disclosure of program performance
3. Auto-generated scorecards for each property, with modelled retrofit recommendations

What is GRID?



1. A customer relationship management (CRM) interface which:
 - Manages data collection & cleaning
 - Manages shifting relationships with building contacts and owners, including the assignment of an internal user to each property; and
 - Generates performance reports at a building or portfolio level
2. A map-based data visualization interface for public disclosure of program performance
3. Auto-generated scorecards for each property, with modelled retrofit recommendations
4. Analytics insights to drive policy and capital deployment

GRID Deployments in Canada



Building Benchmark BC

Purpose: To support property owners and municipalities to participate in voluntary benchmarking and disclosure.

Target Users: Jurisdictions, property owners and managers.

Partners: Natural Resources Canada, CleanBC BIF, Real Estate Foundation of BC, Metro Vancouver, BC Hydro, Integral (Introba), various BC municipalities

BuildingBenchmarkBC.ca/data



THE GAP

The world needs better building data
—fast and at scale—but current
solutions can't deliver the goods.

6 MILLION

6M buildings and countless
homes will need to decarbonize
in North America.

\$120 BILLION +

At current rates, this would
cost building owners \$120B+
on audits alone.

YEARS WE DON'T HAVE

Traditional methods take 3-4
weeks per building—and there
aren't enough consultants to
do the work.



OPEN can fill this gap—
in **1/10** the time,
and **1/10** the cost.

OPEN's AI engine delivers much needed virtual audits and decarbonization plans.



AI-DRIVEN

With its AI capabilities, OPEN's software provides highly-customized and actionable analytics.



SUPER FAST

With faster processing, it can generate real time insights using real time data.



1 BUILDING OR 1 THOUSAND

It can collect data simultaneously from multiple sources for a portfolio-wide view.



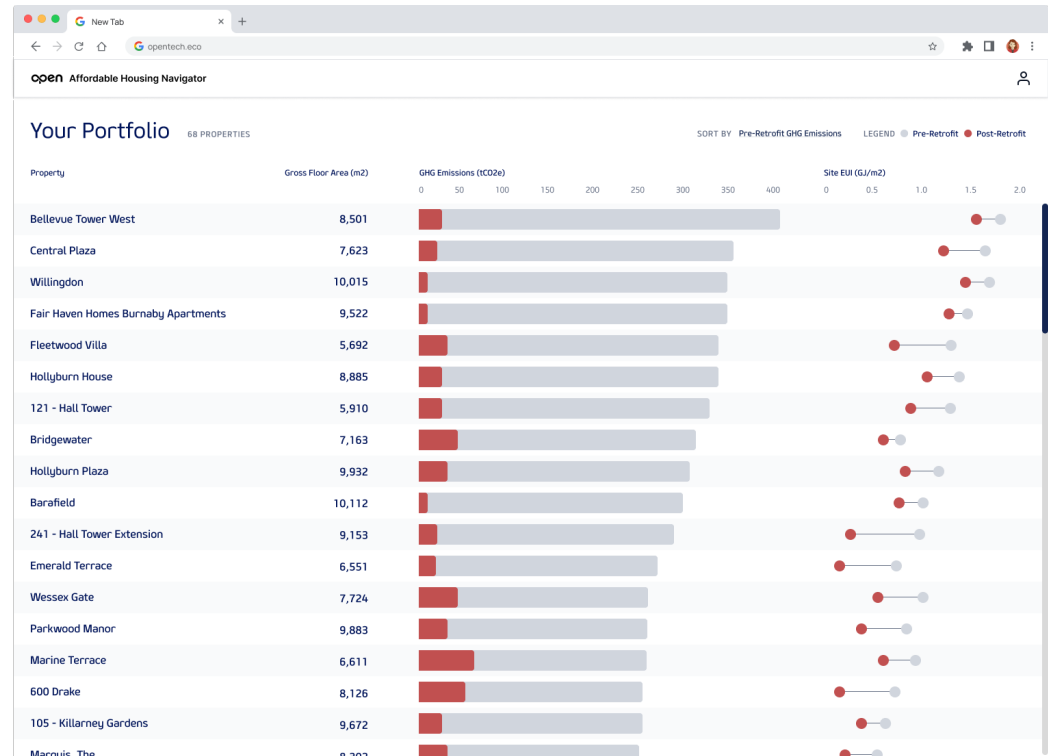
ACCURATE AND RELIABLE

OPEN's program and compliance management means data is accurate and reliable.

Affordable Housing Navigator for Existing Buildings

At a portfolio level, to identify which buildings are the best candidates for retrofit (financing).

At a building level, to identify the suite of retrofit actions that best reflect results and capital plans.



123 Main Street

RENTAL 102 UNITS 5,110 SQFM

Energy Savings GHGs [Add Building Details](#) [Create New Scenario](#) [Save Scenario](#)

Summary

Selected GHG Savings Potential 97% (All Actions: 97%)	Energy Cost Savings \$65,635.00
Total Project Cost \$5,170,000	GHG Reductions 281 tCO2e

Project Costs

● Grant Amount \$3,030,000	<p>TOTAL \$5,170,000</p>
● Financed Amount \$2,140,000	

Operating Costs

Pre-Retrofit		Post-Retrofit
\$119,842		\$63,325
\$53,054	Space Heating	\$12,909 (-23%)
\$4,497	Space Cooling	\$4,497 (-23%)
\$15,177	Lighting	\$11,519 (-23%)
\$25,754	Hot Water	\$15,739 (-23%)
\$8,994	Fans and Pumps	\$6,296 (-23%)
\$12,366	Plug & Process	\$12,366 (-23%)
\$0	Thermal Process	\$0 (0%)

Key Actions

DISPLAY All Actions

Action	Total Cost	Incremental Cost	Return on Investment	% GHG Savings
<input checked="" type="checkbox"/> Replace end of life windows with new, higher performance windows	\$900,000	\$125,000	40%	9%
<input checked="" type="checkbox"/> Replace make-up air units c/w Heat Pump heating & cooling coil	\$600,000	\$65,000	12%	15%
<input checked="" type="checkbox"/> Replace fossil fuel heating with heat pump heating & cooling system	\$985,000	\$500,000	-46%	49%
<input checked="" type="checkbox"/> Upgrade parkade and corridor lighting systems	\$70,000	\$70,000	31%	0.1%
<input checked="" type="checkbox"/> Replace and upgrade domestic hot water to heat pump based equipment	\$300,000	\$180,000	-17%	32%
<input checked="" type="checkbox"/> Reclad walls with higher insulating value + improved air tightness	\$1,800,000	\$360,000	-43%	17%

End Use

Pre-Retrofit		Post-Retrofit
287 tCO2e		6.3 tCO2e
191	Space Heating	1.3 (-99%)
0.5	Space Cooling	0.5 (0%)
1.5	Lighting	1.2 (-24%)
92	Hot Water	1.6 (-98%)
0.9	Fans and Pumps	0.6 (-30%)
1.2	Plug & Process	1.2 (0%)
0	Thermal Process	0 (0%)

123 Main Street

RENTAL 102 UNITS 5,110 SQM

Energy Savings GHGs Add Building Details Create New Scenario Save Scenario

Summary

Selected GHG Savings Potential 88% (All Actions: 97%)	Energy Cost Savings \$30,938.00 /yr
Total Project Cost \$2,800,000	GHG Reductions 253 tCO2e / yr

Project Costs

- Grant Amount
\$1,640,000
- Financed Amount
\$1,160,000



TOTAL
\$2,800,000

Operating Costs

Pre-Retrofit		Post-Retrofit
\$119,842		\$90,095
\$53,054	Space Heating	\$33,373 (-36%)
\$4,497	Space Cooling	\$4,497 (0%)
\$15,177	Lighting	\$15,177 (0%)
\$25,754	Hot Water	\$15,739 (-39%)
\$8,994	Fans and Pumps	\$8,544 (-5%)
\$12,366	Plug & Process	\$12,366 (0%)
\$0	Thermal Process	\$0 (0%)

Key Actions

DISPLAY All Actions

Action	Total Cost	Incremental Cost	Return on Investment	% GHG Savings
<input checked="" type="checkbox"/> Replace end of life windows with new, higher performance windows	\$900,000	\$125,000	40%	9%
<input checked="" type="checkbox"/> Replace make-up air units c/w Heat Pump heating/cooling coil	\$600,000	\$65,000	12%	15%
<input checked="" type="checkbox"/> Replace fossil fuel heating with heat pump heating/cooling sys	\$985,000	\$500,000	-46%	49%
<input type="checkbox"/> Upgrade parkade and corridor lighting systems	\$70,000	\$70,000	31%	0.1%
<input checked="" type="checkbox"/> Replace and upgrade domestic hot water to heat pump based equipment	\$300,000	\$180,000	-17%	32%
<input type="checkbox"/> Reclad walls with higher insulating value + improved air tightness	\$1,800,000	\$360,000	-43%	17%

End Use

Pre-Retrofit		Post-Retrofit
287 tCO2e		34 tCO2e
191	Space Heating	28 (-85%)
0.5	Space Cooling	0.5 (0%)
1.5	Lighting	1.5 (0%)
92	Hot Water	1.6 (-98%)
0.9	Fans and Pumps	0.8 (5%)
1.2	Plug & Process	1.2 (0%)
0	Thermal Process	0 (0%)

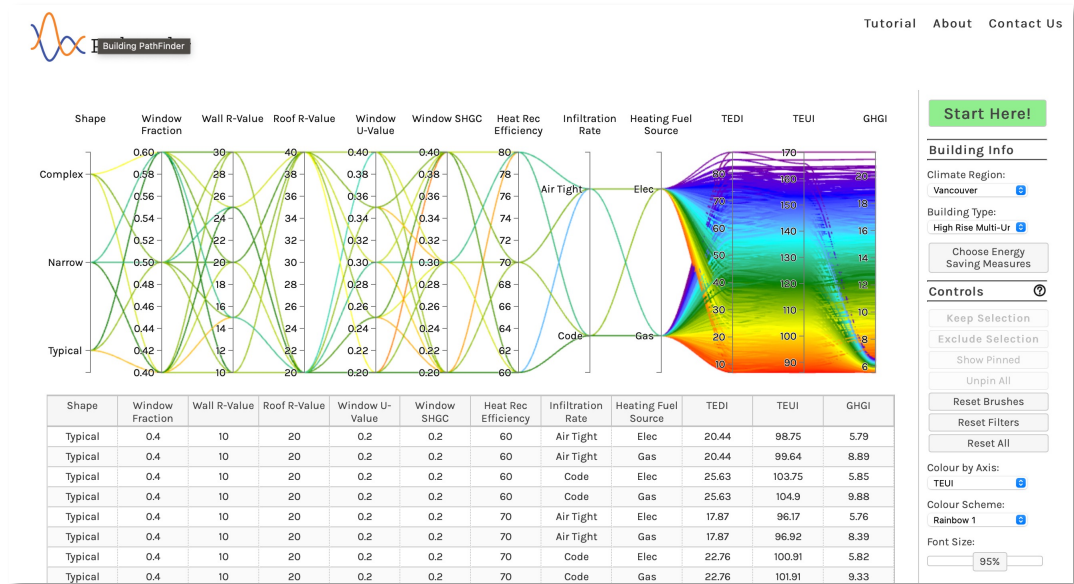
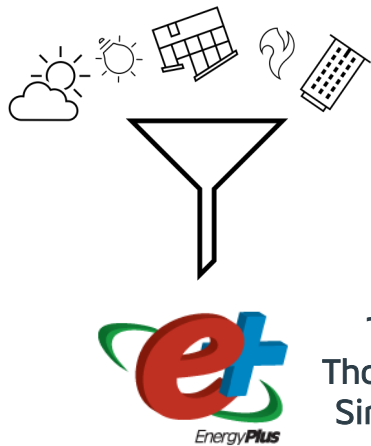
If you are involved in non-profit housing – as provider or financier – please connect.

Donovan Woollard
604-720-4223
donovan@opentech.eco

opentech.eco

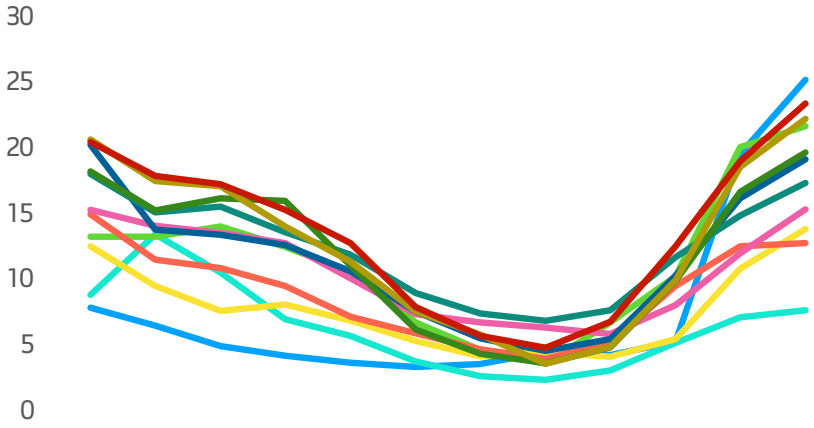


AI Energy Engine

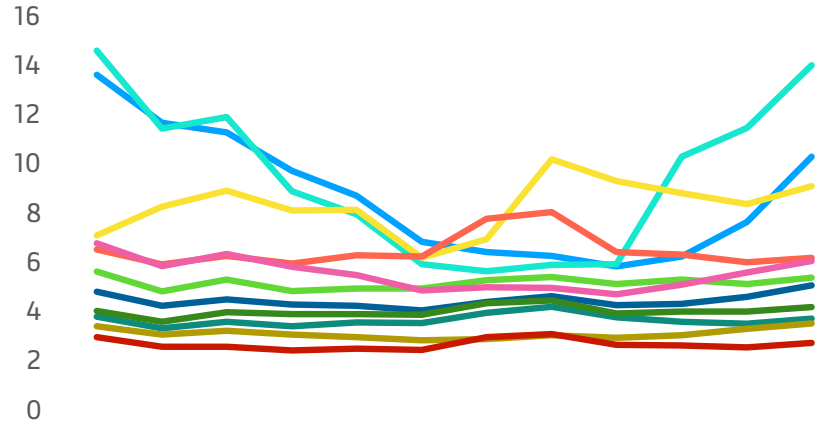


Not all energy use is the same

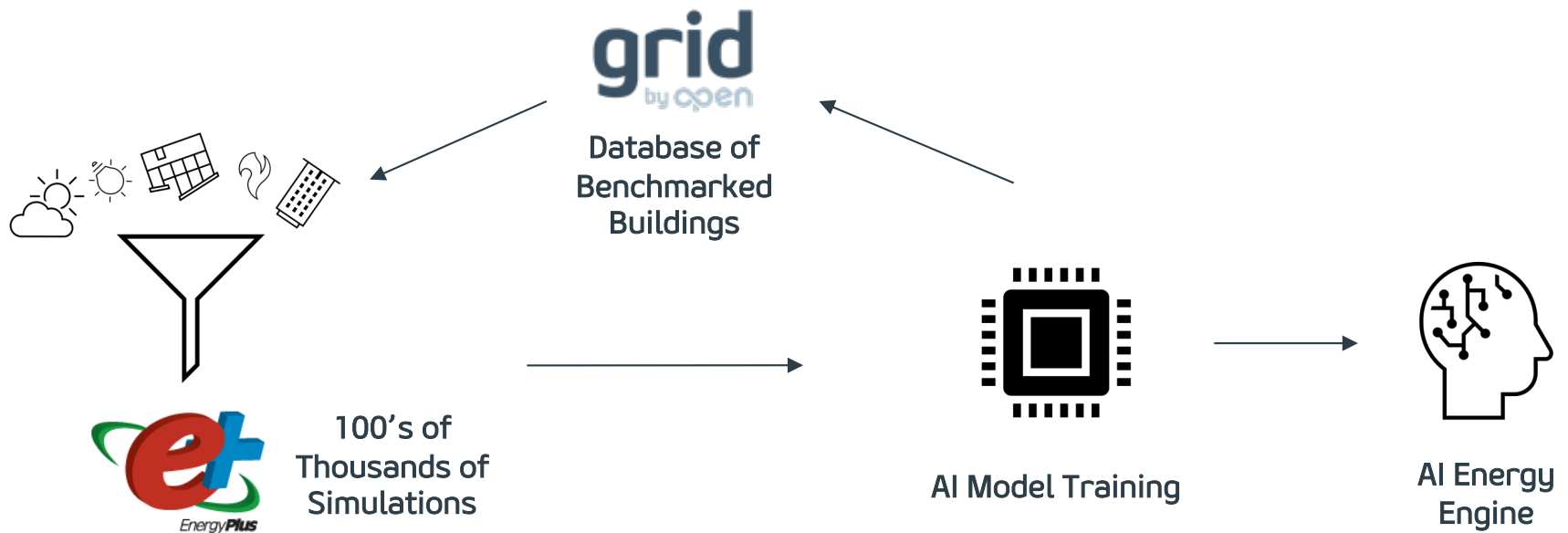
Natural Gas (kWh/m2)



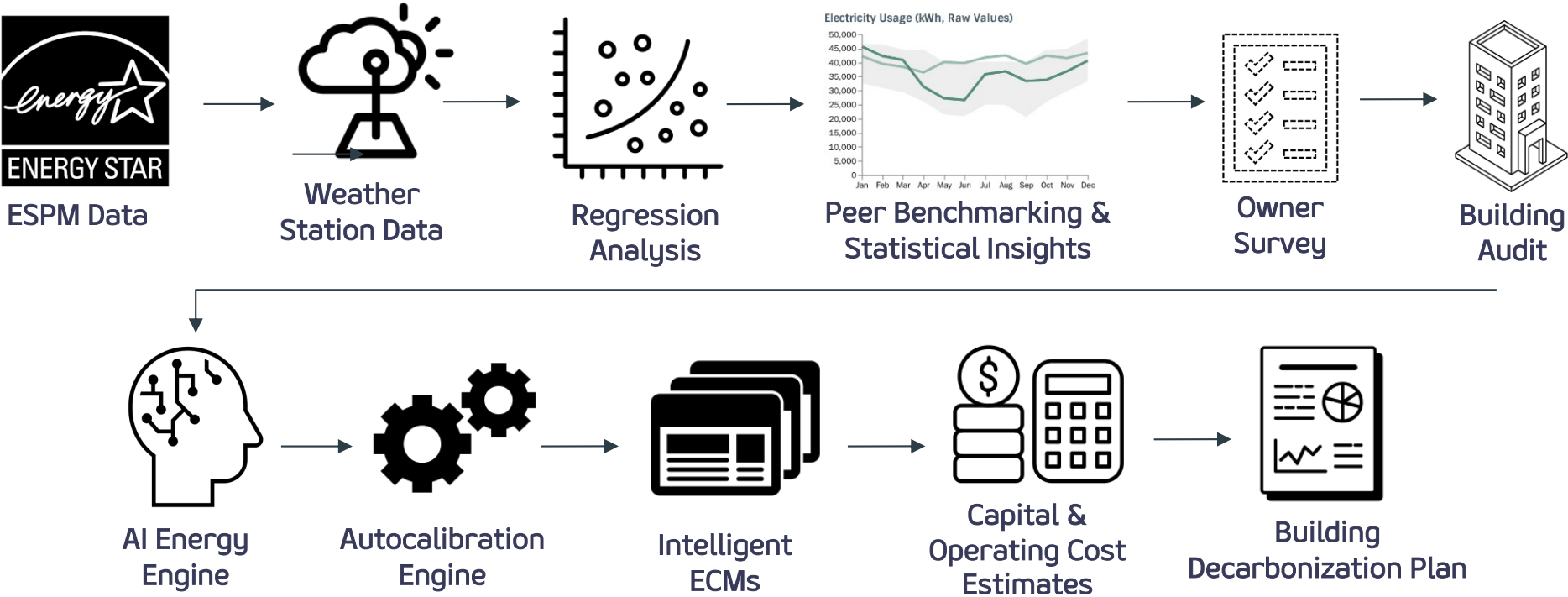
Electricity (kWh/m2)



AI Energy Engine



Virtual Audit + Decarbonization Plan



Energy Use Breakdown

EXISTING

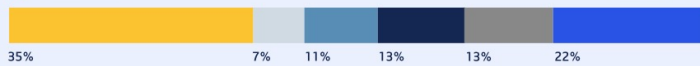
2,407,164 KWH



★ RECOMMENDED

1,094,475 KWH

55% Energy Reduction



ALL

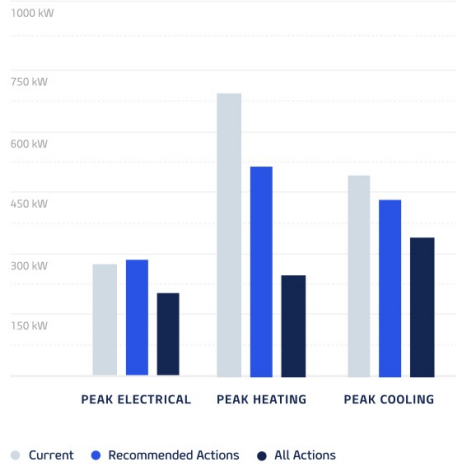
776,759 KWH

68% Energy Reduction



● Space Heating ● Space Cooling ● Lighting ● Hot Water ● Fans & Pumps ● Plug & Process

Peak Load Analysis



Multifamily Residential Specific Strategies

The recommended actions in the decarbonization plan also contribute to other climate strategies as indicated below.

CLIMATE RISK MITIGATION

Cooling Included

The Recommended Actions include adding or maintaining cooling to residential suites.



EV CHARGING

EV Charging Stations

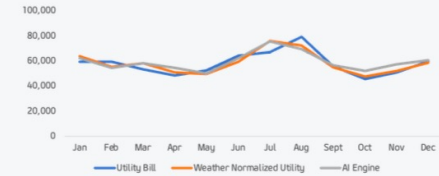
Two Level 2 EV charging stations can be added without upgrading the electrical service.



Model Accuracy

OPEN's AI engine has identified a baseline energy model that matches your submitted monthly utility data to within ASHRAE Guideline 14 tolerances.

MONTHLY ELECTRICITY, KWH



MONTHLY NATURAL GAS, KWH

