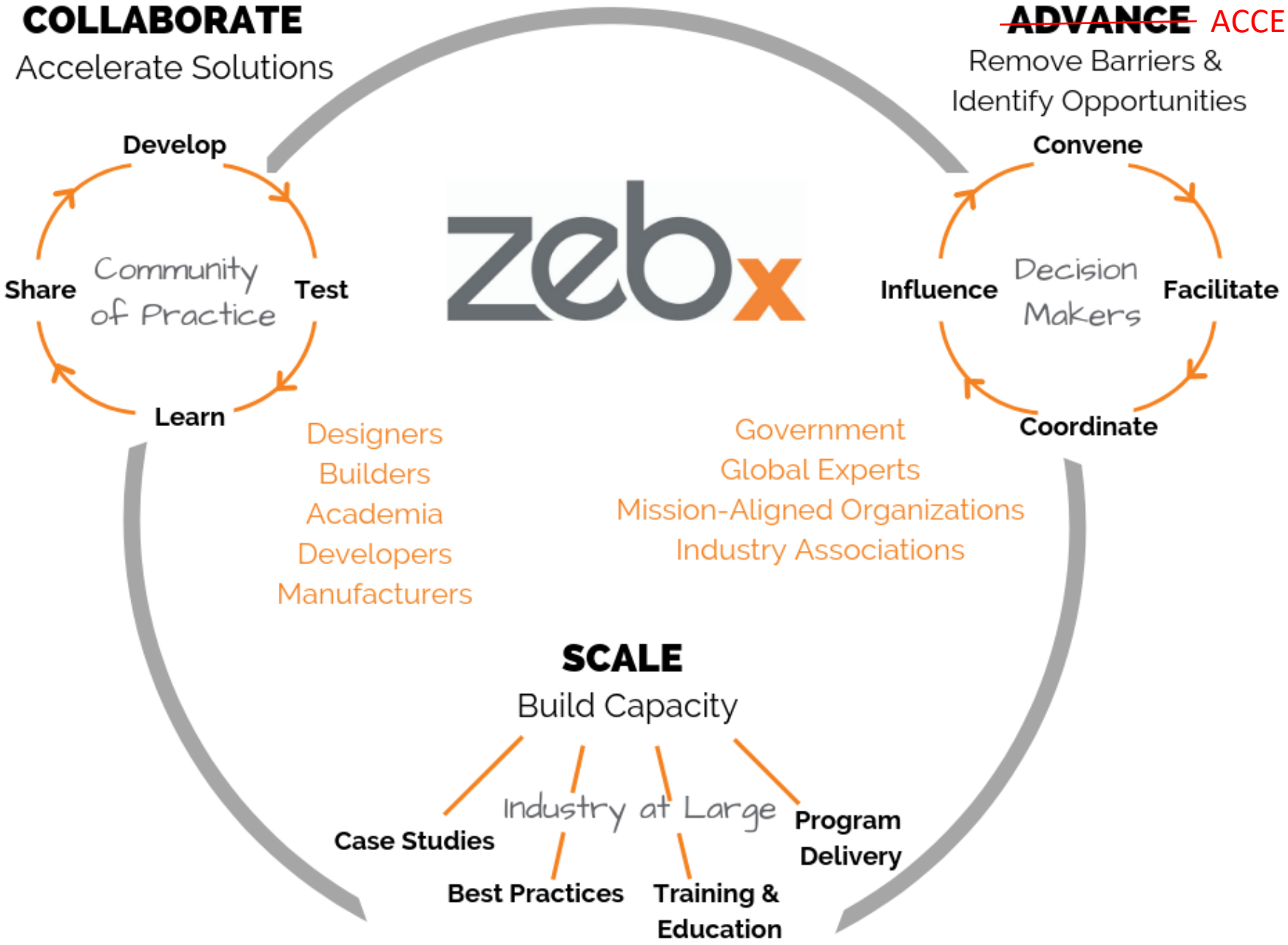

Deep Emissions
Retrofit Dialogue
Series
zebx
BC Hydro
Power smart
CITY OF VANCOUVER
Ready to Roll:
Simple Solutions
for Going Electric
Thu, Feb 17, 2022
10am - 12pm PST
Free webinar I zebx.org
HRAI
YOUR ENVIRONMENT OUR EXPERTISE


COLLABORATE
Accelerate Solutions
ADVANCE ACCELERATE
Remove Barriers &
Identify Opportunities
Develop
Share
Community
of Practice
Test
Learn
zebx
Convene
Influence
Decision
Makers
Facilitate
Coordinate
Designers
Builders
Academia
Developers
Manufacturers
Government
Global Experts
Mission-Aligned Organizations
Industry Associations
SCALE
Build Capacity
Industry at Large
Case Studies
Best Practices
Training &
Education
Program
Delivery

B2E

Building to Electrification Coalition

We are a broad coalition working together to electrify buildings in British Columbia in order to reduce their climate impacts and reliance on fossil fuels.

Building to Electrification Coalition

B2E is a BC-based member-driven coalition working towards a Vision that by 2030, all new and most replacement space heating and domestic hot water systems in BC's buildings will be high-efficiency and low-carbon with electric systems being widely used across all market sectors.

Our Mission

We are a broad coalition working together to electrify buildings in British Columbia in order to reduce their climate impacts and reliance on fossil fuels.

bcgreeneventcalendar.ca

The BC Green Building Calendar

Welcome to the BC Green Building Calendar.

Here you will find all of the latest events and training related to green building subject matter, including: emissions, energy efficiency, resiliency, high-performance design, and more.

If you would like to submit an event or for more details on submission guidelines, see the bottom of this page.

Filters

February 2022

Webinar | **Presented by: ZEBx**

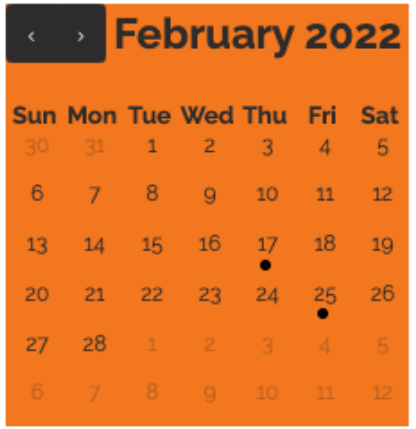
Feb
17
Thursday
10:00am - 12:00pm

Deep Emissions Retrofit Dialogue - Ready to Roll: Simple Solutions for Going Electric

Webinar | **Presented by: ZEBx**

Feb
25
Friday
12:00 - 1:00pm

ZEBx Decarb Lunch - Be Prepared! The BC Energy Step Code Capacity Study.



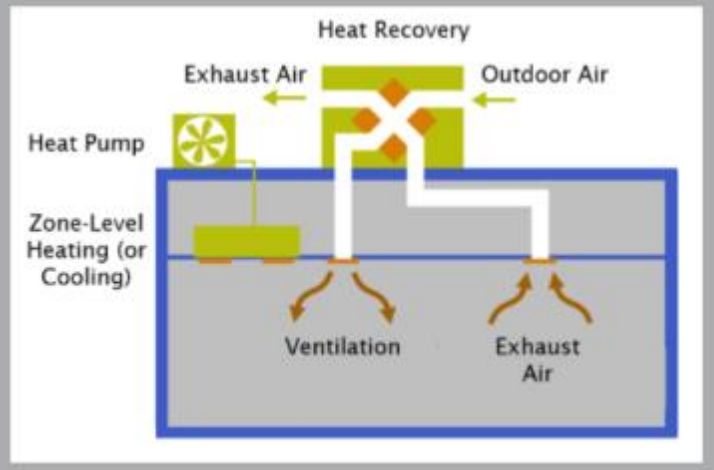
To submit events for your organization:

Join our community

b2electrification.org/b2e-and-industry-resources

Decarbonization Through HVAC Retrofits

Case Study with RDH Building Science



RDH
Making Buildings Better™

b2electrification.org/b2e-and-industry-resources

Residential Hot Water Electrification

Case Study with City Green Solutions

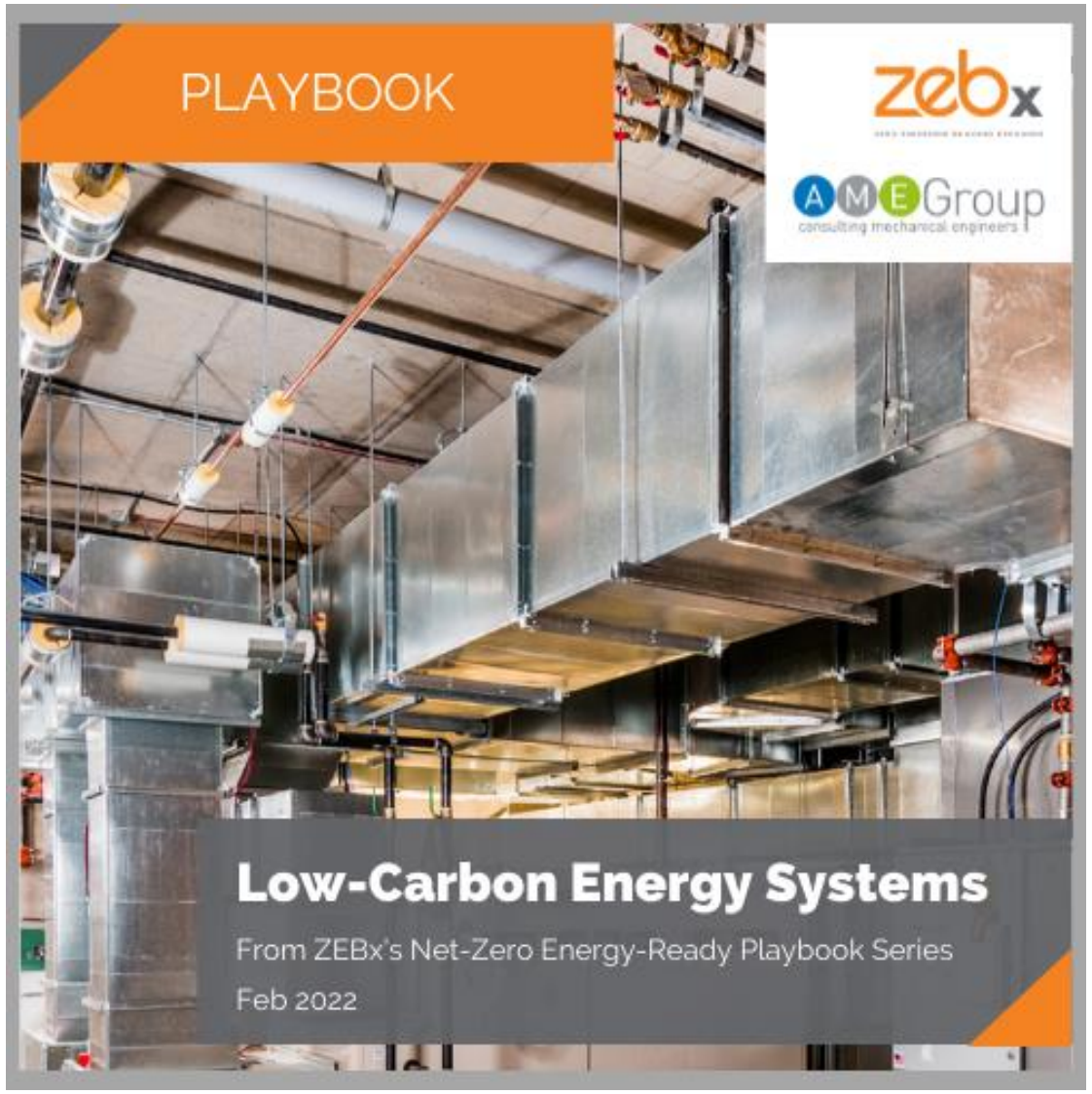
b2electrification.org/b2e-and-industry-resources

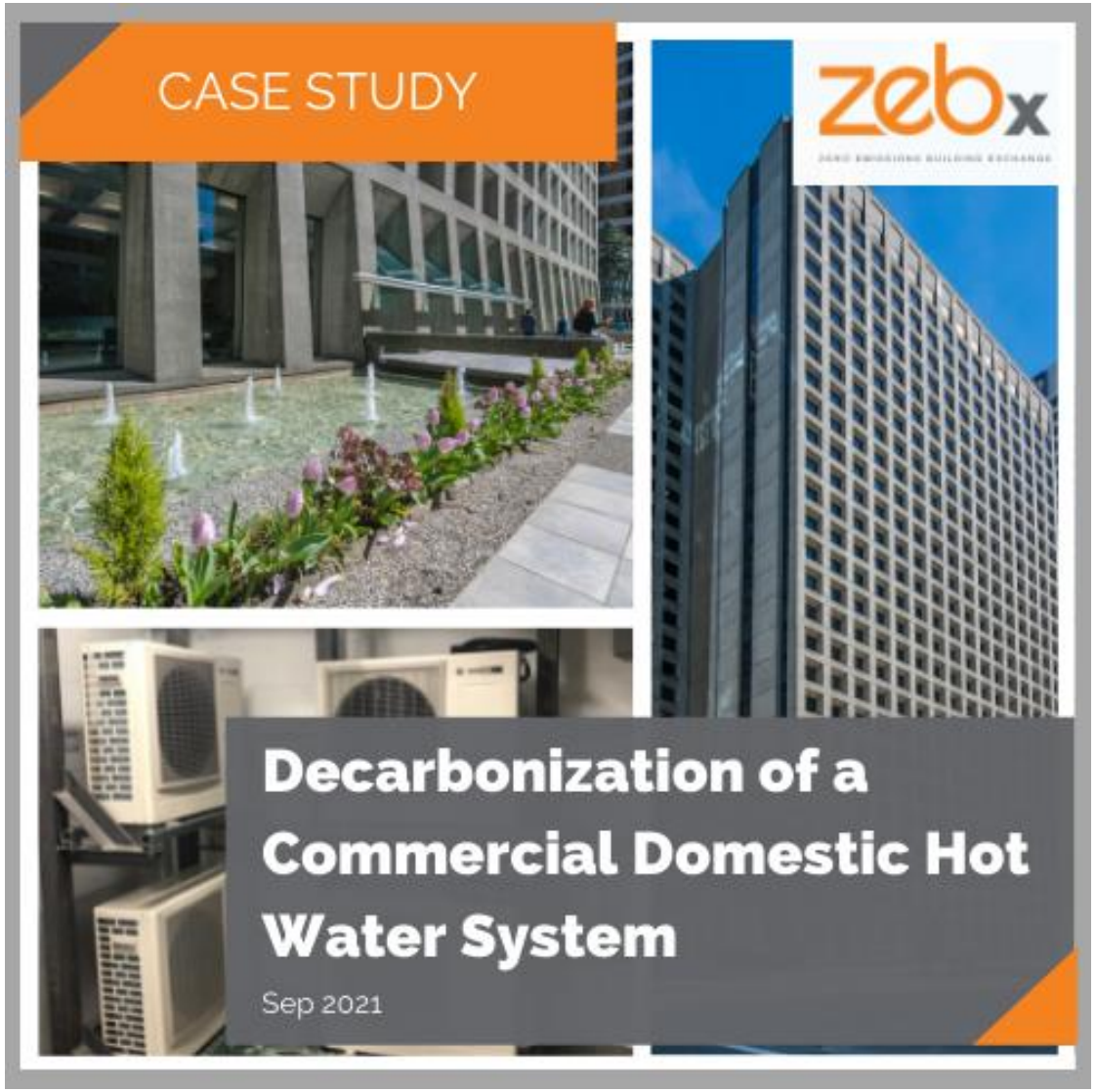
Podcast

The Road to 2030 - Building Electrification in BC

Recorded at the Dec 8, 2021 event

www.zebx.org/resources





POLL

Tell us about yourself!

Three-part anonymous poll

B2E
Building to Electrification

HRAI
YOUR ENVIRONMENT OUR EXPERTISE
The Heating, Refrigeration and Air Conditioning Institute of Canada

"Simplicity is the ultimate sophistication."

- Leonardo Da Vinci

B2E
Building to Electrification

CLIMATE 2050 Roadmap

Buildings

A Pathway to Zero Emissions and Resilient Buildings

BC Hydro's Electrification Plan

A clean future powered by water

SEPTEMBER 2021

The industry-led
United Nations-convened
Net-Zero Banking Alliance

cleanBC
BETTER HOMES

cleanBC
BETTER BUILDINGS

BC Hydro
Power smart

B2E
Building to Electrification

About HRAI-Canada

- **Established in 1968**
- **>1,200 member corporations**
  - 90 Manufacturers; 60 Wholesalers/Distributors; 900 Contractors; 150 Associates
  - 22 staff, 10 instructors, 5 regional offices, 15 chapters
- **Services to Members and Industry**
  - Industry Advocacy and Government Relations – “the voice of the industry”
  - Industry Training (technical design, business management)
  - Communications (magazine, e-newsletter, webinars)
  - Trade Show – Canadian Mechanicals and Plumbing Exposition (CMPX 2022)
  - Environmental Stewardship (Refrigerant Management Canada, Thermostat Recovery Program)
  - Conservation/Demand Management Program Administration (almost a million rebates in 10 years)

The Industry We Represent

- Heating and cooling of buildings (by various methods)
- Ventilation and indoor air quality (IAQ)
- Refrigeration processes
  - Industry
  - Grocery stores
  - Institutions (hospitals, schools)
  - Ice rinks
  - Various specialty applications
- Building control systems
- > $12 billion in activity per year and tens of thousands of jobs across the country

HVACR Industry *Opportunities*

The energy transition creates opportunities for the HVACR Sector:

- Increased demand for more efficient HVAC products
- Transition to newer technologies an opportunity for those who adapt
- Smart building controls present benefits beyond efficiency
- Innovations and technology refinement will offer greater benefits
- Not just products but *"building as a system"* - requires skills and expertise
- The next generation - meaningful progress on climate change while earning a living

HVACR Industry *Challenges*

The energy transition will present challenges for the HVACR Sector:

- Industry needs time and resources to *adapt*
  - Product innovation to accommodate fuel switching & increasing efficiency standards
  - Growing sophistication of codes and building systems
  - Growing need for *skilled labour*
  - Clear and consistent signals
- New technologies disrupting the industry in the short term
- New refrigerants creating emerging issues
- Need for standardization of protocols
- Marketing issues for the industry – need to *educate market*

A Coordinated Approach

As part of the Building 2 Electrification Leadership Coalition, HRAI:

- ❖ Represents and advocates for industry
- ❖ Educates government and stakeholders
- ❖ Leads on priority issues:
  - Climate Action Policies
  - Workforce Development
  - Emerging technologies

Thank you!

To connect or for more information:

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hraimail@hrai.ca
Tel: 905-602-4700
Toll-free: 1-800-267-2231

READY TO ROLL: RESIDENTIAL RETROFIT FUEL SWITCHING

(Part 9 Homes)

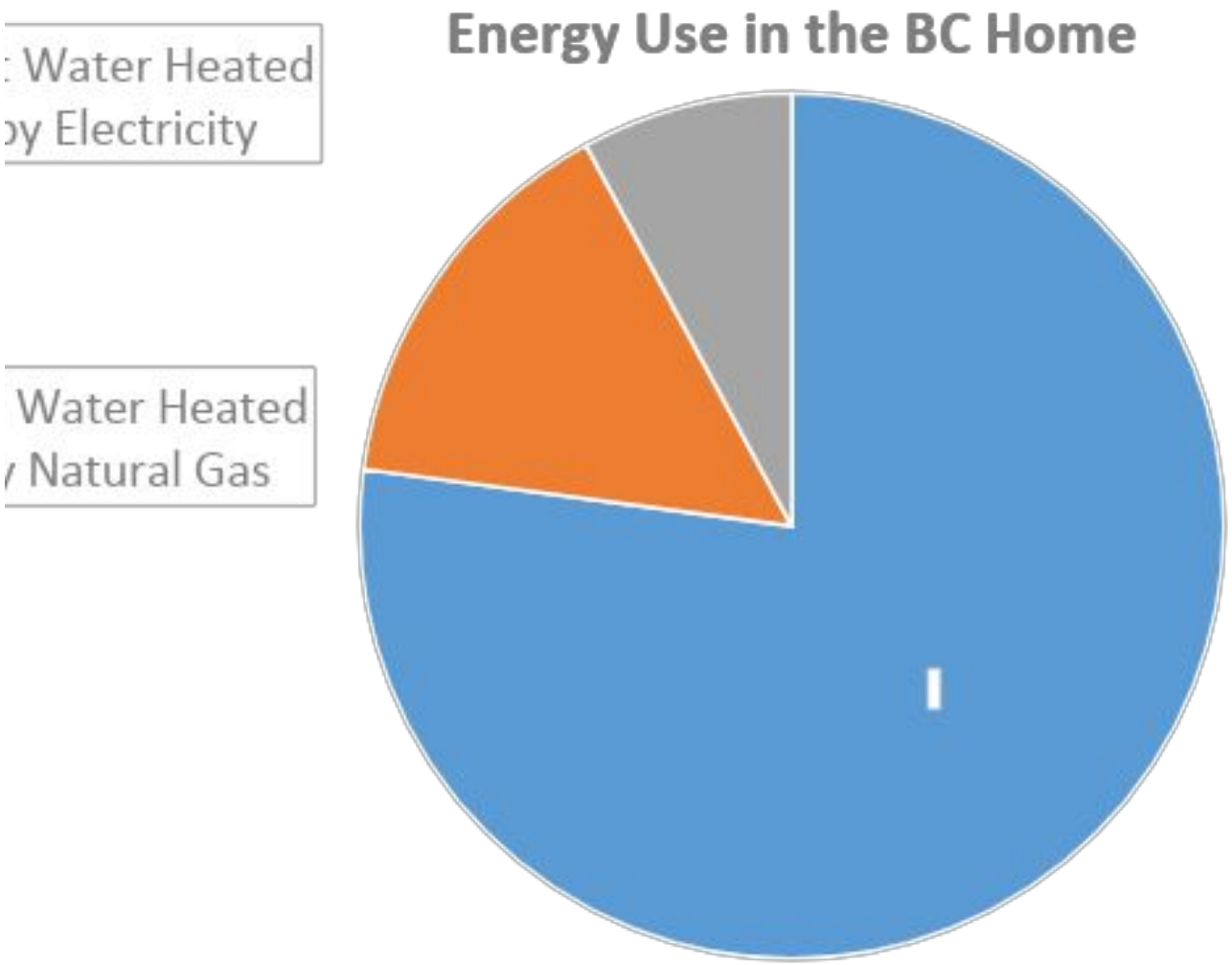
CityGreen Solutions

CityGreen
Solutions

The Case For Residential Hot Water Electrification

CityGreen Solutions

Residential Hot Water Electrification



- **WATER HEATING = ~23%** of total household energy use
- **66%** of BC residential water heating is fueled by natural gas
- Natural gas hot water heating = a significant contributor to residential GHG emissions

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Residential Hot Water Electrification
GHG EMISSIONS REDUCTIONS

Single Family Residential hot water electrification
can deliver, on average, approximately

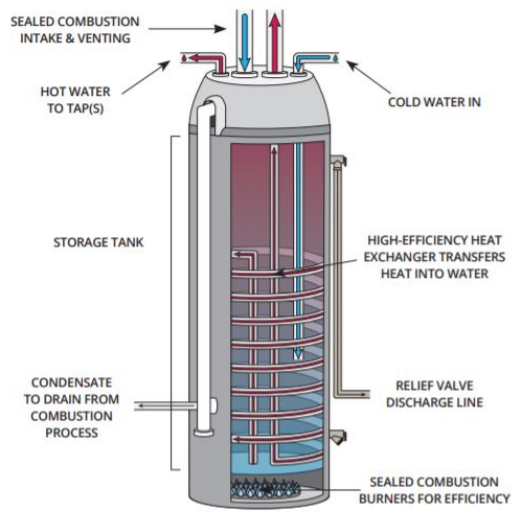
1.04 Tonnes of GHG Emission Reductions
Per Home
Per Year

CityGreen Solutions

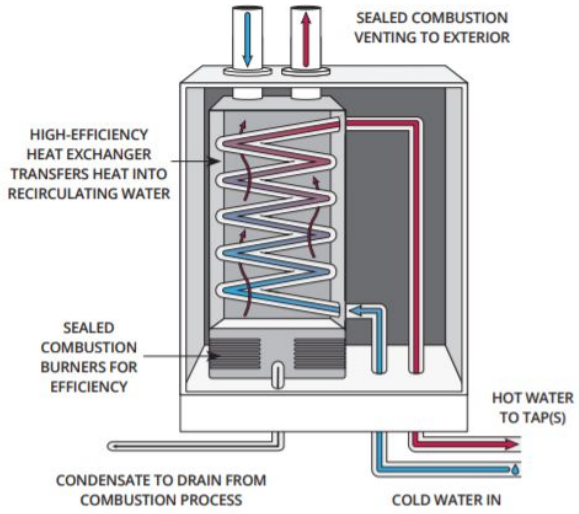
Residential Hot Water Electrification
GHG EMISSIONS

Gas Hot Water Heating = Over 1 Tonne GHG EMISSIONS Per Home/Year

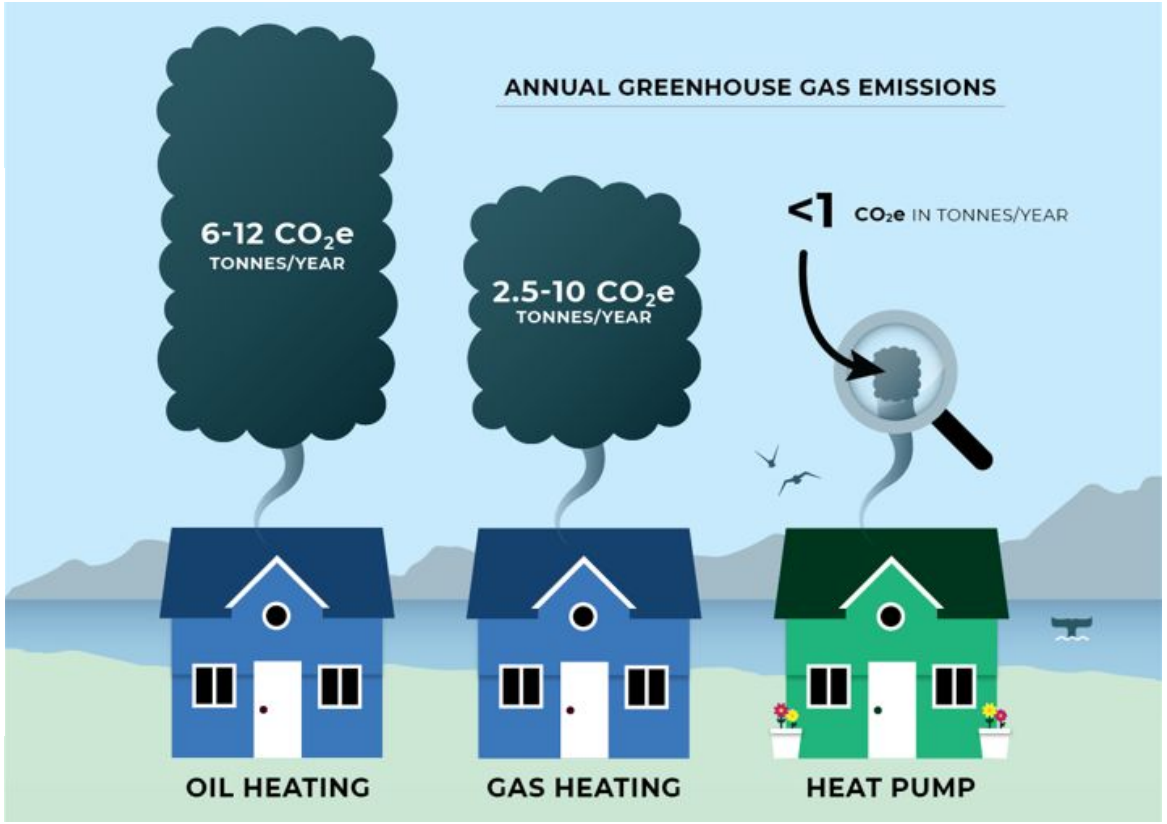
Standard Tank Gas



Tankless Gas



Electric Home (All Energy)= Under 1 Tonne GHG Emissions Per Home/Year



Residential Hot Water Electrification
COSTS

But isn't it cheaper
to heat hot water
with
GAS?

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Residential Hot Water Electrification
PURCHASING COSTS

Electric Options Have Lower Purchasing Costs

Comparison of Gas VS. Electric Water Heating Systems					
	Gas		Electric		
System	Standard Tank	Tankless	Standard Tank	Premium Tank	Heat Pump Hot Water System
Typical Lifespan Average	7 to 10 Years	20 years	7 to 10 Years	25 years	13 years
Comparative GHG Emissions	very high	very high	very low	very low	very low
Upfront Purchase Costs	**$1700**	**$4000**	**$900**	**$1300**	**$3000-$6,000**

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Residential Hot Water Electrification
REGULAR GAS VS ELECTIC

Lifecycle costs include: Purchase price + operational costs/energy bills + maintenance costs

Comparable to Lower Lifecycle Costs Electric Options

Comparison of Regular Gas vs. Electric Water Heating Systems					
Attributes	**Regular Natural Gas**		**Electric**		
System	**Standard Gas Tank**	**Tankless System**	**Standard Tank**	**Premium Tank**	**Heat Pump Hot Water System**
Annual Operation Costs Source: FortisBC Home Energy Calculator	$341	$230	$499	$488	$126 - $191
Annual Maintenance Costs	None	$100 Annually	None	None	$100 Annually
25-year Cost Projection Results (Includes purchase price, operational costs, maintenance fees. Does not include rebates)	7 yr. Tank $14,596 10 yr. Tank **$12,775**	**$13,250**	7 yr. Tank $15,689 10 yr. Tank $14,725	**$13,500**	**Mid-Efficiency (UEF2.3): $13,044** **High-Efficiency (UEF3.5): $11,419**

Residential Hot Water Electrification
ELECTRIC VS 100% RENEWABLE GAS

Lower Life-Cycle Cost When Heating with Electricity

Gas Water Heating Systems (Using 100% Renewable Natural Gas) vs. Electric Water Heating Systems					
	100% Renewable Natural Gas		Electric		
System	**Standard Gas Tank**	**Tankless System**	**Standard Tank**	**Premium Tank**	**Heat Pump Hot Water System**
Annual Operation Costs Source: FortisBC Home Energy Calculator	$516	$348	$499	$488	$126 - $191
25-Year Cost Projection Results* (Includes purchase costs, operation and maintenance costs. Does not include rebates)	7 yr. Tank $18,971 10 yr. Tank $17,150	$16,200	7 yr. Tank **$15,689** 10 yr. Tank **$14,725**	**$13,500**	Mid-Efficiency (UEF2.3): **$13,044** High-Efficiency (UEF3.5): **$11,419**

Residential Hot Water Electrification
READY TO ROLL?

IN SUMMARY – SWITCHING FROM GAS TO ELECTRIC HOT WATER

1. **Lower Upfront Purchase Cost Electric Options**

2. **Electric Systems have Comparable or Lower Lifecycle Costs**

3. **Electric Systems = GHG Reductions, 1 Tonne + Per Home/Year.**

4. **Electric Systems Options are Ready to Roll**
   - **Supply and Industry Capacity to Install Standard and Premium Tanks**

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Residential Hot Water Electrification
RELATIVELY READY TO ROLL

Low Consumer and Industry Awareness

- GHG reduction potential of electric DHW
- Comparable or lower cost options

Standard Industry/Consumer Practices

- Industry used to replacing like-with-like at point of failure
- Homeowner needs to plan ahead

Challenges with Combination Boiler Systems

- It’s more than a hot water tank = full system change

Few Financial Incentives

- Few rebate options for electric DHW equipment and electrical service upgrades (only for Heat Pump Hot Water Systems)

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The Case For Residential Space Heating Electrification

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Residential Space Heating Electrification
KEY FINDINGS

"You can find a heat pump to work in pretty much any home. But like any other heating system, the more insulated your home is, the more efficient your heat pump will be."

(BC Hydro PowerSmart – Heat Pump Myth Busters)

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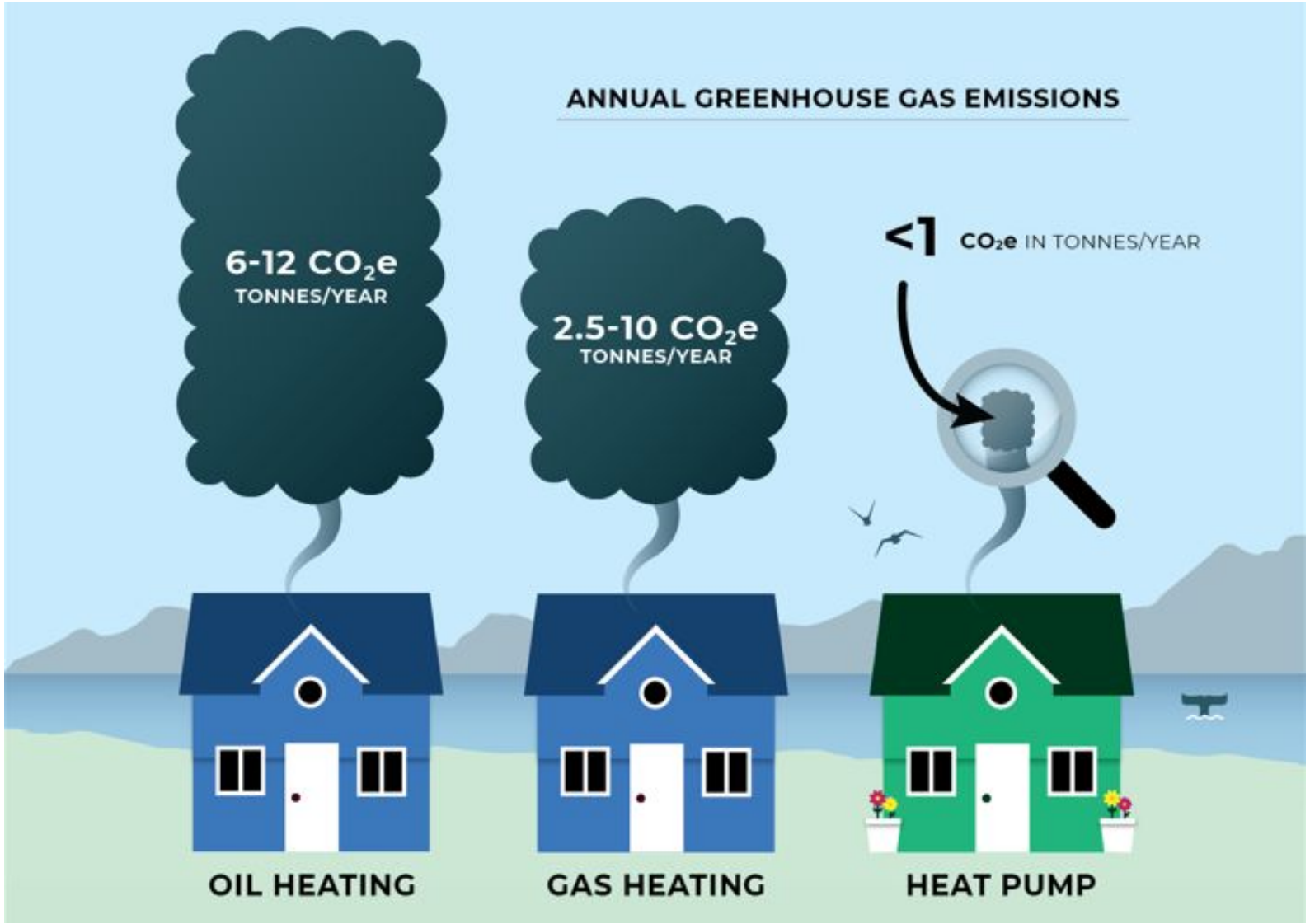
Residential Space Heating Electrification
GHG EMISSION REDUCTIONS



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Myth #1: Heat Pumps Are Too Expensive

Heating System Comparison	High-Efficiency Gas Furnace	Cold Climate Central Ducted Heat Pump
Equipment and Installation Cost	Average Range: $6,000 to $18,000 **Average: $7,000**	Average Range: $12,000 - $27,000 **Average: $18,000**
Rebates Available	Up to $1,000	Up To $11,000 + municipal top ups
Cost After Rebates	**Average: $6,000** **Range: $5,000 - $17,000**	**Average: $7,000** **Range: $1,000 - $16,000**
Air Conditioning	No	Yes
Average After Upgrade Greenhouse Gas Emissions Range Per Year	2.5 to 6 Tonnes	Under 1 Tonne

Myth #2: Heat Pumps Are Expensive to Operate

Heat pumps can have comparable to lower operating costs to natural gas homes

- ✔ **Other Home Upgrades:** Upgrading insulation, windows, air sealing = lower energy bills.
- ✔ **Purchase Higher Efficiency Heat Pump:** The more efficient the heat pump the lower the energy bills. Cold climate heat pumps for all locations in BC?
- ✔ **Quality Installation:** A heat pump sized for the home & well-installed will work more efficiently and cost-effectively.

Residential Space Heating Electrification
HEAT PUMP VS 100% RENEWABLE GAS

	Capital Cost (including install)	Annual Maintenance Cost	Insulation Level of House	Annual Operation Cost	Overall Costs projected over a 15-year timespan (Capital + Maintenance + Operation)
Central Cold Climate Heat Pump (COP 2.9)	Low $12,000	$100	Well	$647	$23,203
			Average	$932	$27,486
			Poor	$1,789	$40,336
	Average $18,000	$100	Well	$647	$29,203
			Average	$932	$33,486
			Poor	$1,789	$46,336
	High $27,000	$100	Well	$647	$38,203
			Average	$932	$42,486
			Poor	$1,789	$55,336

	Capital Cost (including install)	Annual Maintenance Cost	Insulation Level of House	Annual Operation Cost	Overall Costs projected over a 15-year timespan (Capital + Maintenance + Operation)
Natural Gas Furnace (AFUE 95) **RENEWABLE NATURAL GAS**	Low $6,000	$100	Well	$981	$22,219
			Average	$1,395	$28,425
			Poor	$2,636	$47,041
	Average $7,000	$100	Well	$981	$23,219
			Average	$1,395	$29,425
			Poor	$2,636	$48,041
	High $18,000	$100	Well	$981	$34,219
			Average	$1,395	$40,425
			Poor	$2,636	$59,041

Capital Costs Higher

Operation Costs Lower

Over 15 Years - Costs Comparable (Before Rebates)

- **Heat Pump Range ($23K - $55K)**
- **RNG Furnace Range ($22K - $59K)**

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Residential Space Heating Electrification
READY TO ROLL?

HEAT PUMPS HAVE (COMPARED TO GAS FURNACES with 100% RNG)

- On average, comparable to lower purchase costs (AFTER REBATES)
- Lower operating costs (compared to furnace with 100% RNG)
- Comparable lifecycle costs (before rebates)
- Lower lifecycle costs (after rebates)

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Residential Space Heating Electrification
RELATIVELY READY TO ROLL

Speed Bumps

- **Consumer awareness**
- **Need for complementary building envelope retrofits**
- Industry willingness to transition to fuel switching
- **Industry training and capacity for scaling and quality installation**
- Addressing electrical capacity issues at household level
- **Affordability (incentives required for cost parity and mass adoption)**

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WHAT IS READY TO ROLL?

1. MOST HOMES CAN ELECTRIFY WATER HEATING

- Lower purchase costs options (premium electric tanks)
- Lower lifecycle cost options (premium electric tanks and heat pump hot water)
- Heat pump water heaters – are higher purchase price and lower lifecycle cost (compared to regular gas and renewable gas)

2. MOST HOMES CAN ELECTRIFY SPACE HEATING

- On average, comparable to lower purchase costs (AFTER REBATES)
- Lower operating costs (compared to furnace with 100% RNG)
- Comparable lifecycle costs (before rebates)
- Lower lifecycle costs (after rebates)

CityGreen Solutions

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peter.sundberg@citygreen.ca

CityGreen Solutions

February 17, 2022

Electrification Opportunities for MURBs

John Foster & Sofia Marmolejo, FRESCo

B2E
Building to Electrification Coalition

zebx

FRESCo
Building Efficiency

www.frescoltd.com | info@frescoltd.com | 1-866-598-1213

Who are we?

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FRESCo Building Efficiency

Ready to Roll Opportunities in MURBs

- Central make-up air
- Central domestic hot water heating
- In-suite heat pumps

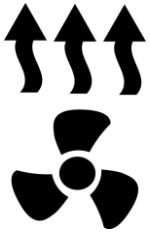
Ready to roll = no electrical service upgrade

**Available capacity varies by building*

FRESCo Building Efficiency


1) Plan Ahead
2) Tie into End-of-Life Replacements

Central Make Up Air Heat Pumps

REDUCE LOAD FIRST: • Ventilation controls • Central heat recovery	Estimated Cost <$1k per suite 
MAIN BENEFITS: • No disruption to suites • Add some cooling to the building • Strong economics	**MAIN CONSIDERATIONS:** • Added equipment weight to the roof • Fuel for auxiliary heat

** Many older MURBs (prior to ~1980) don't have central mechanical ventilation*

FRESCo Building Efficiency

Central Make Up Air Gas to Heat Pump

FRESCo Building Efficiency

Central Domestic Hot Water
Gas Boiler to Heat Pumps

REDUCE LOAD FIRST: • Low flow shower heads and sink aerators • Under-tub heat recovery	Estimate Cost $2-3k per suite 
MAIN BENEFITS: • No disruption to residents	**MAIN CONSIDERATIONS:** • Space for outdoor units • Space & added weight for additional storage tanks

**There are also solutions that allow in-suite domestic hot water heat pumps where space and configurations allow*

FRESCo Building Efficiency

Central Domestic Hot Water

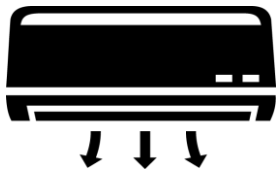
FRESCo Building Efficiency

In-Suite Heat Pumps

1. **Electric baseboard heaters to heat pumps**
    1. Frees up kW capacity for use elsewhere
    2. Reduce electric bills & build installer base
2. **Central hydronic heating to heat pumps**
    1. Biggest opportunity to reduce emissions
    2. Lowrises easy placement of mini-splits
    3. Highrises packaged in-suite or balcony mini-splits
3. **Air Conditioning**
    1. Replace existing AC wall units in Okanagan

FRESCo Building Efficiency

In-Suite Heat Pumps

REDUCE LOAD FIRST: • Air sealing • Enclosure • Heat recovery ventilation	Estimated Costs $4-10k per suite 
MAIN BENEFITS: • No resident displacement • Added cooling & air filtration • Better temperature control • Avoid/reduce maintenance cost for hydronic system	**MAIN CONSIDERATIONS:** • Envelope penetrations • Locate outdoor units • Condensate & defrost drainage • Heat distribution to bedrooms

FRESCo Building Efficiency

Mini-Split Heat Pumps

Augmenting high-temp hydronic

AC Added	Yes
Transferred cost to suite meter	Partially
$ / suite est.	$5-11k
GHG reduction	42% (of heating)

FRESCo Building Efficiency

Mini-Split

Conversion from hydronic – Low-rise

AC Added	Yes
Transferred cost to tenant meter	Entire Space Heat Cost
$ / suite est.	$5-11k
GHG reduction	95% (of heating)

FRESCo Building Efficiency

All-in-One

In-suite Packaged Air Source Heat Pumps

AC Added	Yes
Transferred cost to suite meter	Entire Space Heat Cost
$ / suite est.	$6-10k
GHG reduction	95% (of heating)

FRESCo Building Efficiency

MURB Specific Considerations

- **Electrical infrastructure** – multiple small meters without whole building demand metering
- **Decarbonization plan** - competing priorities for electrical capacity
- **Archetype** - Easier to retrofit low-rises vs high-rises
- **Rental buildings**: limitations by the *Rental Tenancy Act*
- **Strata buildings**: multiple owners, difficult decision making

FRESCo Building Efficiency

Questions?

Thank You!

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FRESCo
Building Efficiency

www.frescoltd.com

FEBRUARY 17, 2022

Solutions for Small Commercial Buildings

Christy Love, P.Eng., CPHC, Principal

RDH

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RDH Building Science – Who we are

- People with a passion for making buildings better
- We do this by providing services that include:
  - Climate resilience evaluation and planning
  - Energy and carbon analysis
  - Architectural and engineering design of renewals
  - Project and construction management
  - Depreciation Reports
  - Building Enclosure Condition Assessments
  - Warranty Reviews
  - Research, testing, investigation

RDH

HVAC Conversion Pilot for Small Commercial Buildings

- Small commercial (< 25,000 ft^2)
  - Includes small office, retail, schools, restaurants, small assembly
  - Makes up approx. half of the commercial building floor area in the Pacific Northwest.
  - Smaller HVAC systems; typically not engineered

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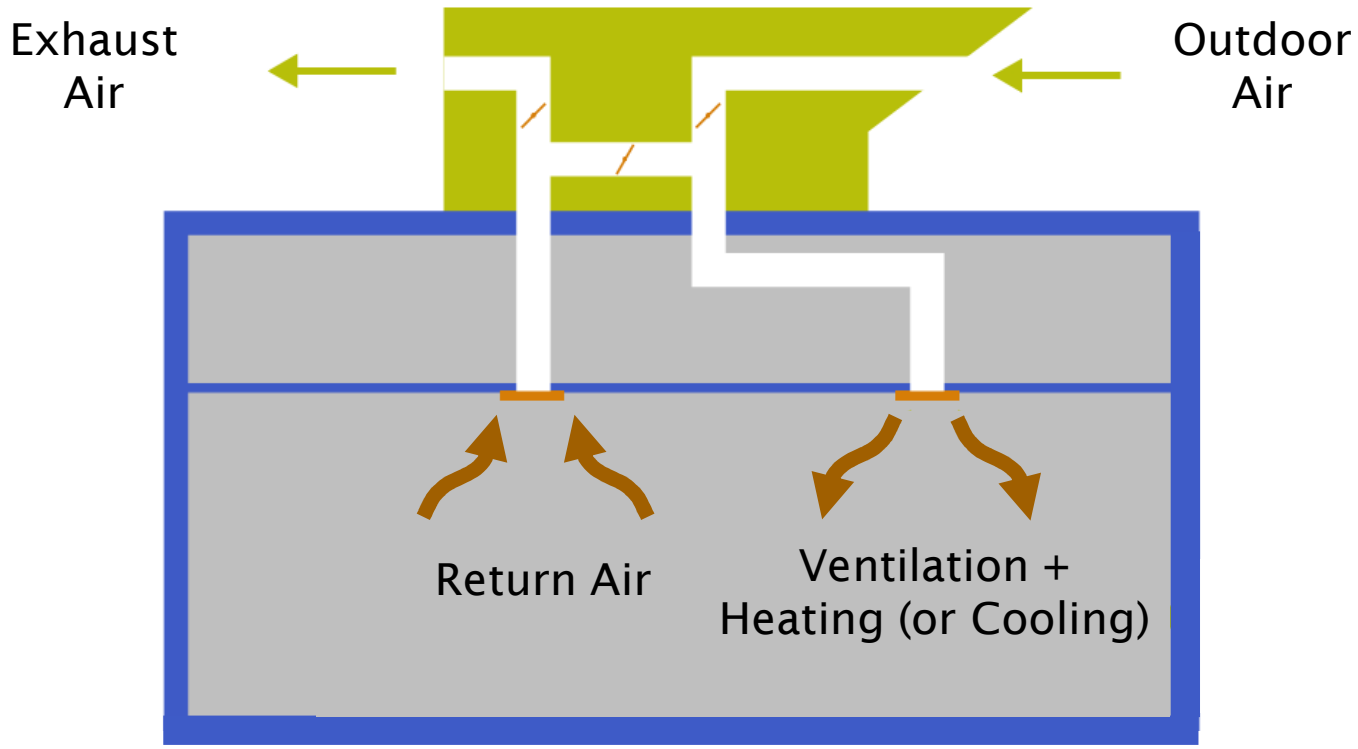
neea

Typical Existing System



<u>Conventional</u> Packaged Rooftop Unit

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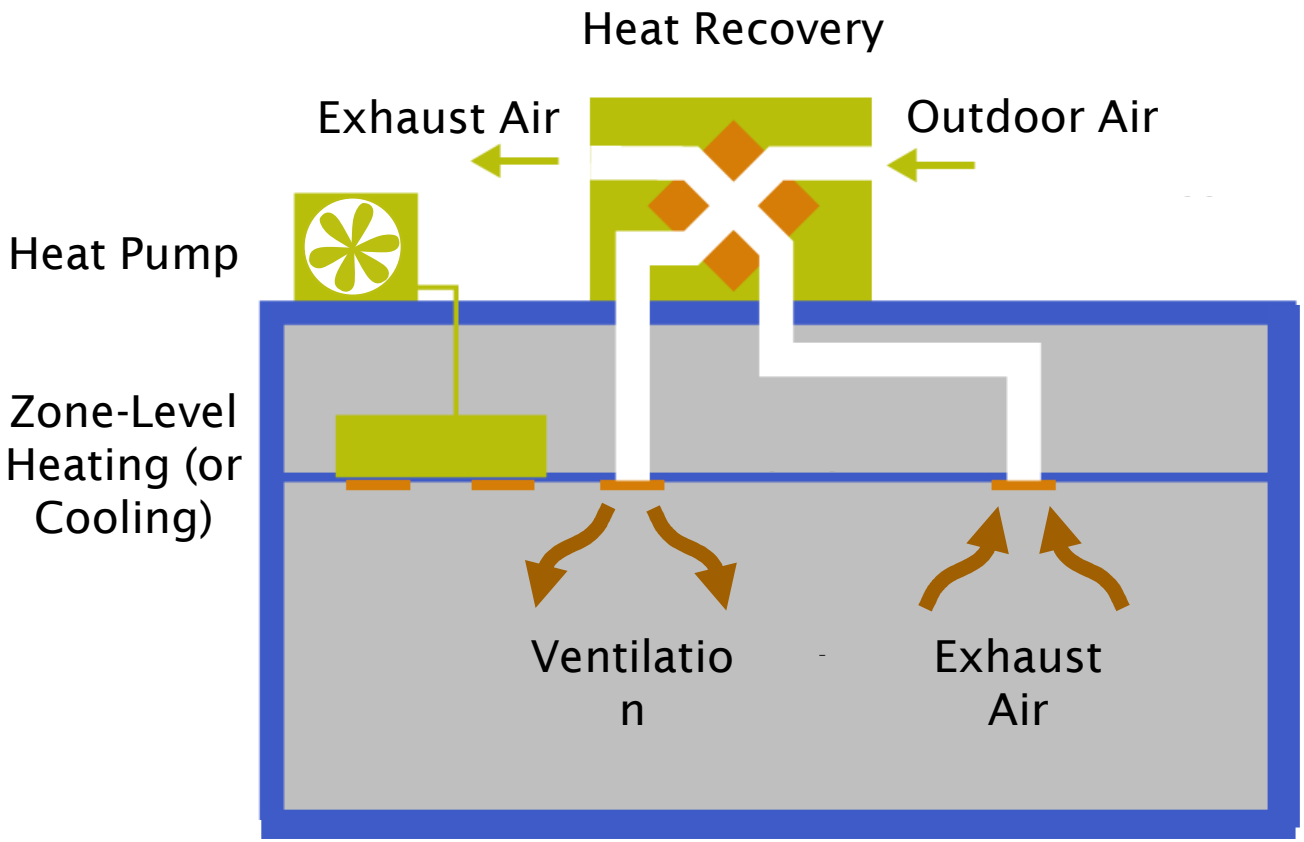
Pilot Project Conversion System



Dedicated Outdoor Air System

The Buildings

Results: Physical Impacts + Downsizing

Results: Physical Impacts + Downsizing

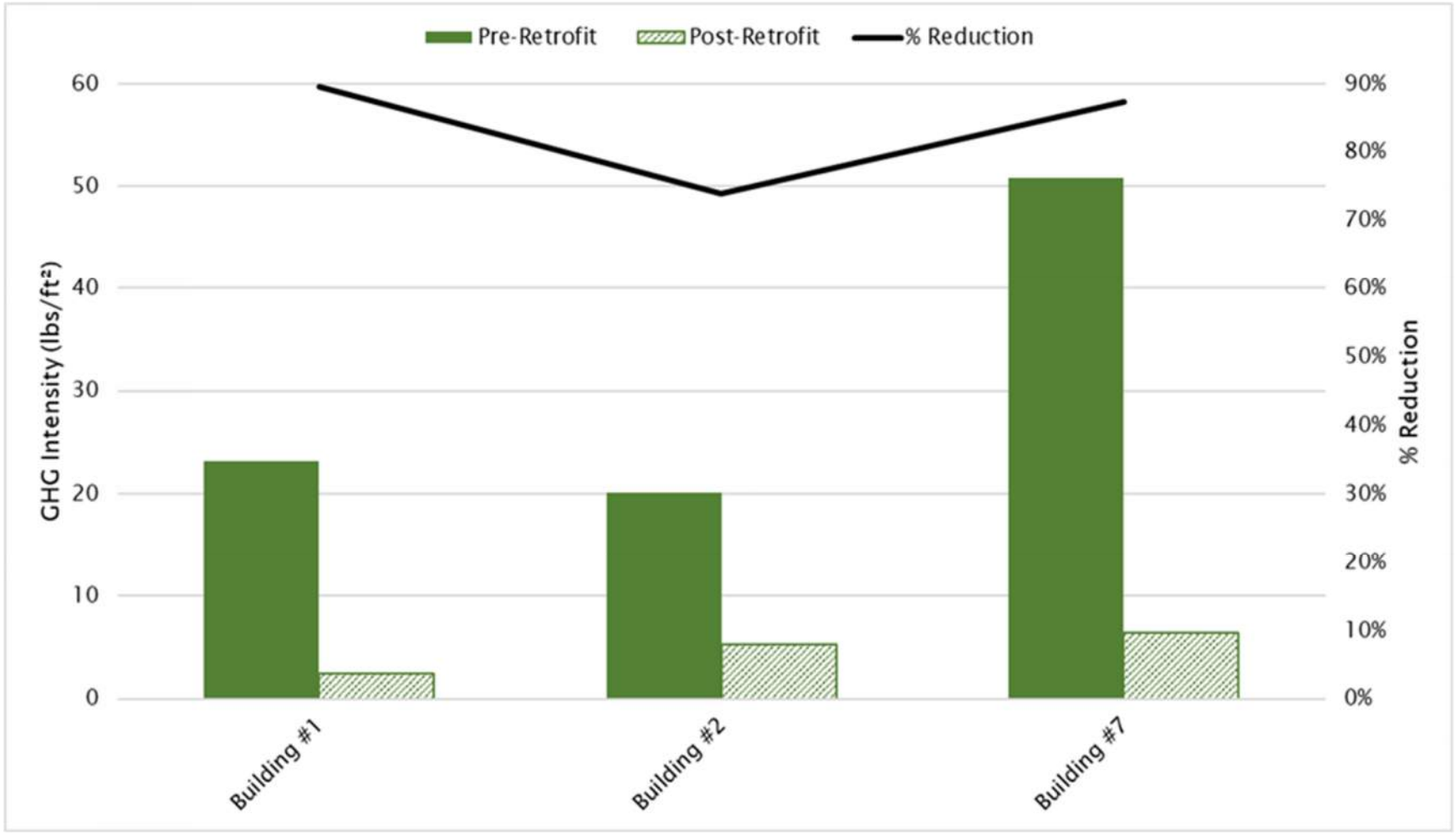
Results – Energy Savings

#	Building Location and Type	Pre-Retrofit Total Energy Use (kWh/m²)	Post-Retrofit Total Energy Use (kWh/m²)	Total Energy Savings (%)	Total HVAC Energy Savings (%)
7	Seattle WA Office W/Assembly	481	152	68%	89%
1	Portland OR Office	178	60	66%	75%
8	Darby MT Dormitory	324	162	50%	77%
2	Corvallis OR Office*	183	99	46%	77%
6	Seattle WA Office	162	94	42%	70%
4	Libby MT Office W/Garage	322	221	32%	48%
5	Portland OR Restaurant	2,916	2,212	24%	77%
3	Corvallis OR Restaurant	4,779	4,264	11%	51%

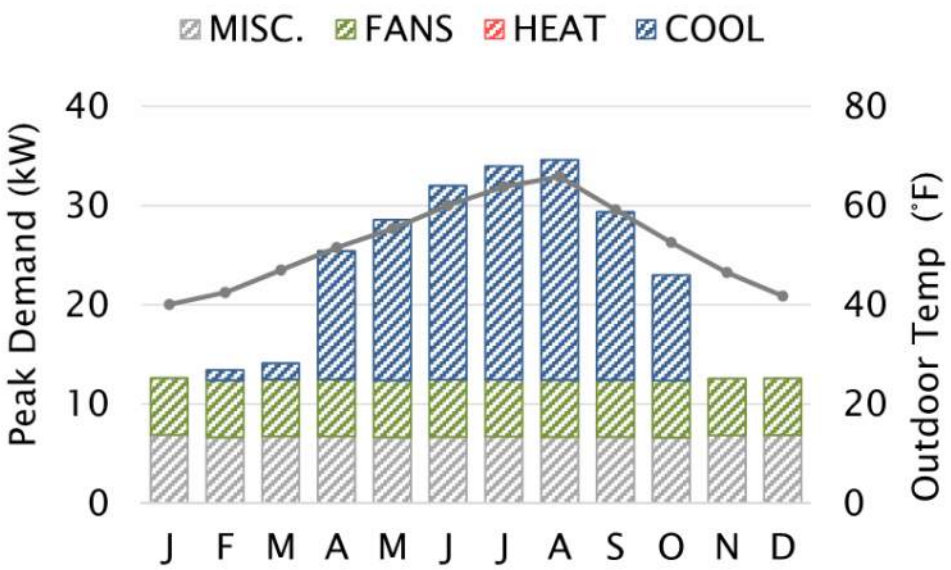
Results – Total Emissions Savings

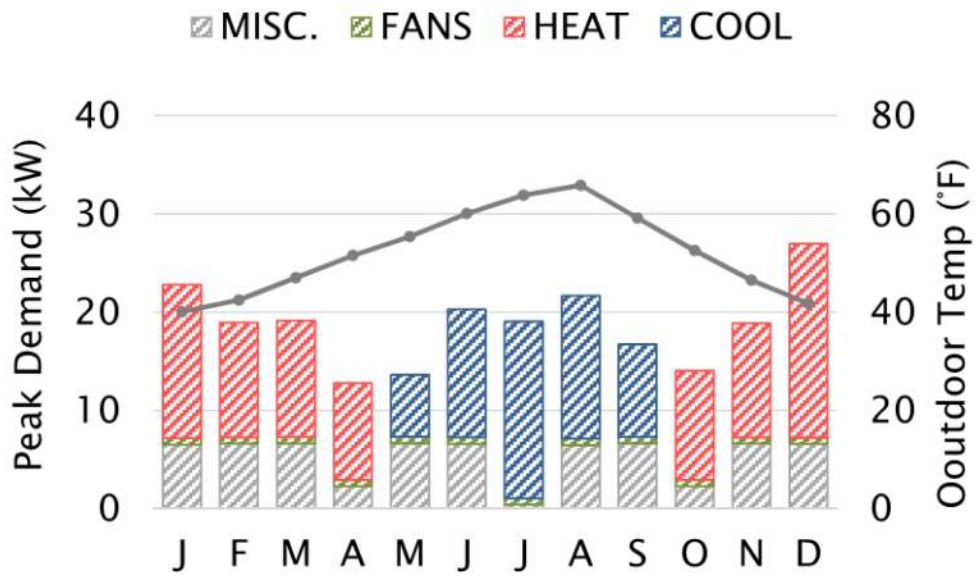
#	Building Location and Type	Emissions ($kgCO_2e/m^2$)		% Reduction
		Pre-Retrofit	Post-Retrofit	
1	Portland OR Office	23	2	90%
7	Seattle WA Office W/Assembly	51	6	87%
2	Corvallis OR Office*	20	5	74%
8	Darby MT Dormitory	13	7	50%
6	Seattle WA Office	7	4	42%
5	Portland OR Restaurant	463	310	33%
4	Libby MT Office W/Garage	13	9	32%
3	Corvallis OR Restaurant	727	623	14%

Results – Total Emissions Savings

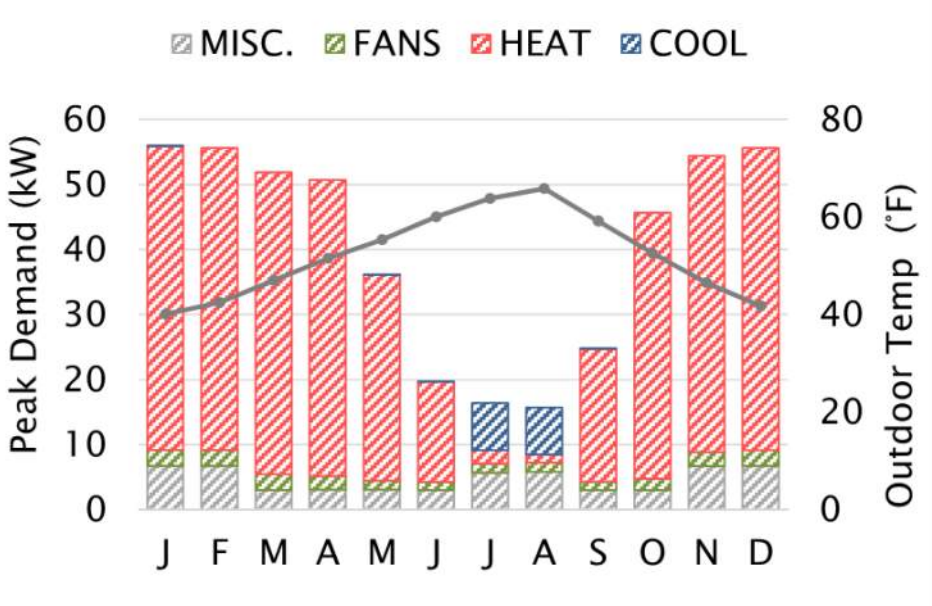


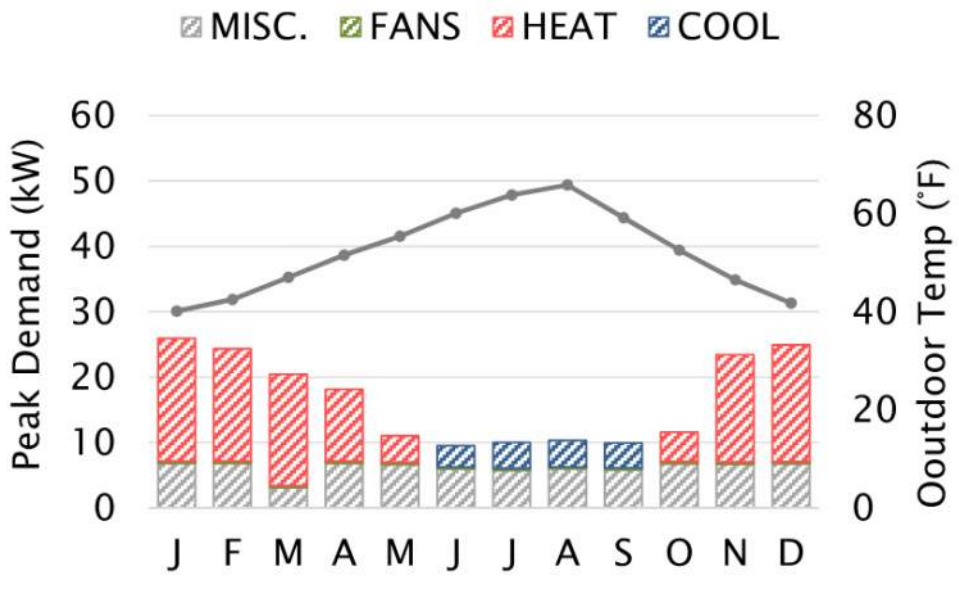
Results: Peak Electricity Demand Savings





Results: Peak Electricity Demand Savings





Key Takeaways

- Significant savings potential by rethinking end of life equipment replacement
  - Full electrification
  - 50 – 85% HVAC energy savings
  - ~40 - 60% whole-building energy savings
  - 30 – 40% cooling demand reduction
- Savings could have been higher

Conversion Pilot Lessons Learned

- Several pilots initially specified old equipment capacity
- Relied heavily on design assistance from heat pump equipment suppliers
- Watch zoning ($$$)

Minimum Performance Spec

Very High Efficiency Dedicated Outside Air System Design Specifications and Guidelines

Heat Recovery Ventilation – Minimum Performance & Features / Capabilities	
1.	Minimum sensible recovery efficiency: Passive House Certified, or 85% Sensible Effectiveness at 50% of nominal full air flow[1]
2.	Minimum fan efficacy: 2.0 cfm/Watt (0.5 W/cfm) at 0.5" w.g. at 50% of nominal full air flow[2]
3.	Control capabilities: DCV, by zone; control based on time, occupancy, CO_2, pressure
4.	Economizing (heat recovery bypass)
5.	Adaptive defrost, no recirculation allowed
6.	Cross-flow leakage: less than 3%[3]
7.	BACNet, Modbus interface capability
8.	Outdoor-rated; outdoor / roof mounting capability (all climates)
9.	Dedicated ducting / zoning (separate from heating / cooling air flows, separately controlled)

https://neea.org/our-work/very-high-efficiency-doas-requirements

Minimum Performance Spec

Heating/Cooling Systems - Minimum Performance & Features / Documentation	
1.	Heating[4] (Ducted/Unducted): HSPF 9.5 (≤ 65 kBtu/hr); COP @ 47 °F 3.2, COP @ 17 °F 2.2 (> 65 kBtu/hr)
2.	Cooling[4] (Ducted/Unducted): EER 11.0
3.	No simultaneous heating/cooling ("heat recovery") w/o an analysis showing cost-effective incremental savings and a zoning plan that will effectively utilize this feature (e.g., core/perimeter)
4.	System proposals must include, at a minimum: outdoor unit spec, indoor unit(s) spec, controls spec & sequence of operations, dedicated ducting, zoning; proposed system drawings
Critical System Design Guidelines	
1.	Complete separation of ventilation air from heating/cooling air, with each controlled separately (but coordinated) and zoned independently
2.	HRV sizing: individual units specified to run at 40-60% of nominal rated full flow when meeting ASHRAE 62.1 ventilation rates (fully occupied, non-boosted); ducting sized for max flow
3.	Heating/cooling sizing: *no less than* 600 sq ft/ton of system cooling capacity
4.	For ducted systems: supply & return for each space served by 25 cfm or more of supply air (spaces without doors exempt)
5.	Ventilation supply air delivered to one side of space, exhaust air extracted from opposite side
6.	System commissioning, including ventilation system air flow verification[5]
7.	Duct-sealing and leakage testing as part of commissioning scope; ventilation duct insulation where required (in unconditioned spaces, to/from outdoors to HRV)
8.	Modeling: TBD

Discussion + Questions

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Simple Solutions for Electrification

READY TO ROLL (Residential)

- Domestic hot water
- Space heating and cooling (heat pump)

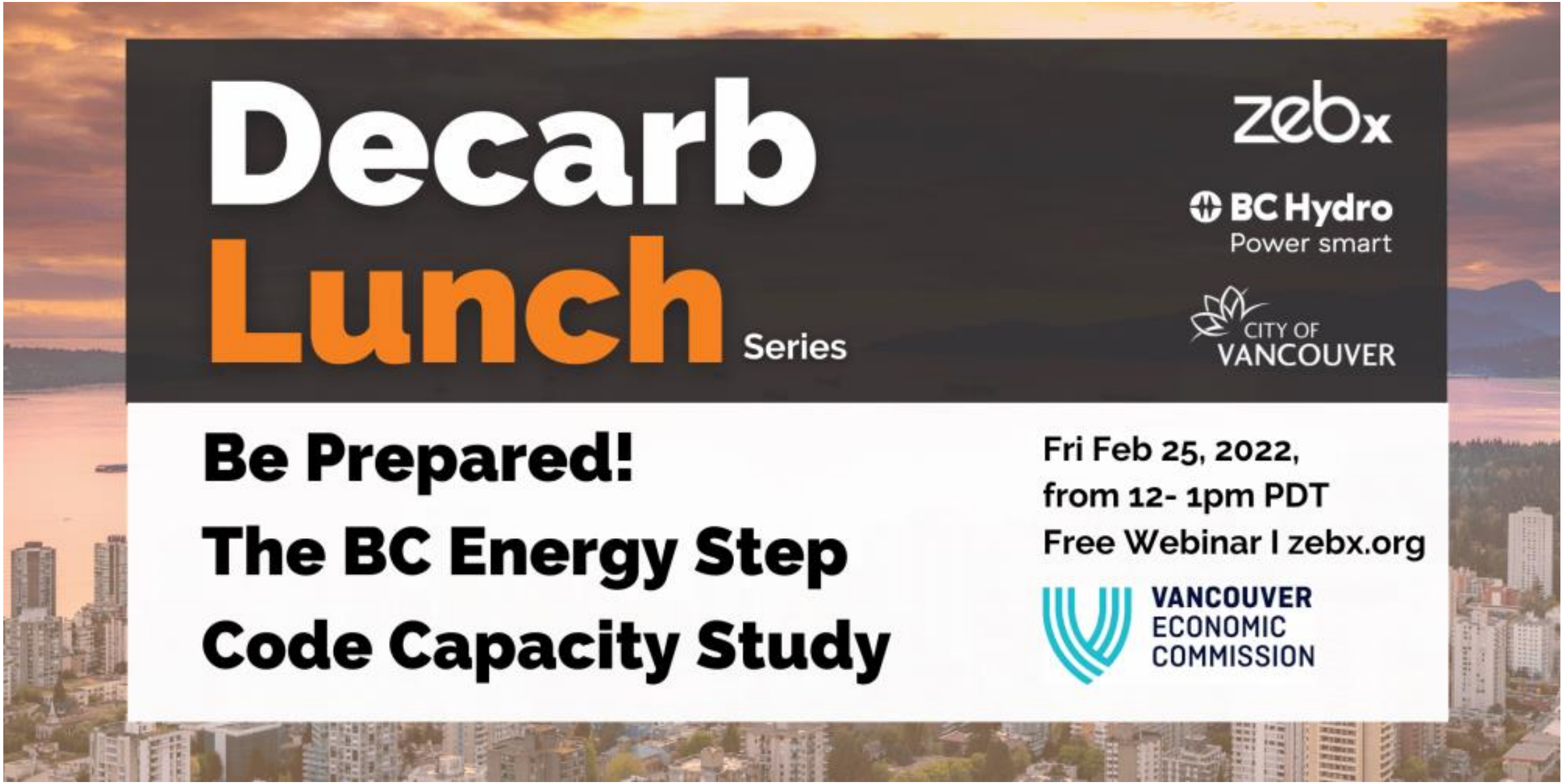
READY TO ROLL (MURB)

- Central MUA heat pumps
- Central DHW heat pumps
- In-suite heat pumps

READY TO ROLL (Commercial)

- Dedicated outdoor air system (DOAS)


TECH DEMO SERIES
zebx
BC Hydro
Power smart
CITY OF VANCOUVER
Heat Pumps
The Lync Aegis CO2 Heat Pump
IN-PERSON WORKSHOP EVENT
Feb 24, 2022 from 10am - 2pm PST
BCIT Burnaby Campus
BCIT
BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY
RIADA


Decarb
Lunch
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BC Hydro
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CITY OF
VANCOUVER
Be Prepared!
The BC Energy Step
Code Capacity Study
Fri Feb 25, 2022,
from 12- 1pm PDT
Free Webinar I zebx.org
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YOUR ENVIRONMENT OUR EXPERTISE

Thank you!

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B2E
Building to Electrification