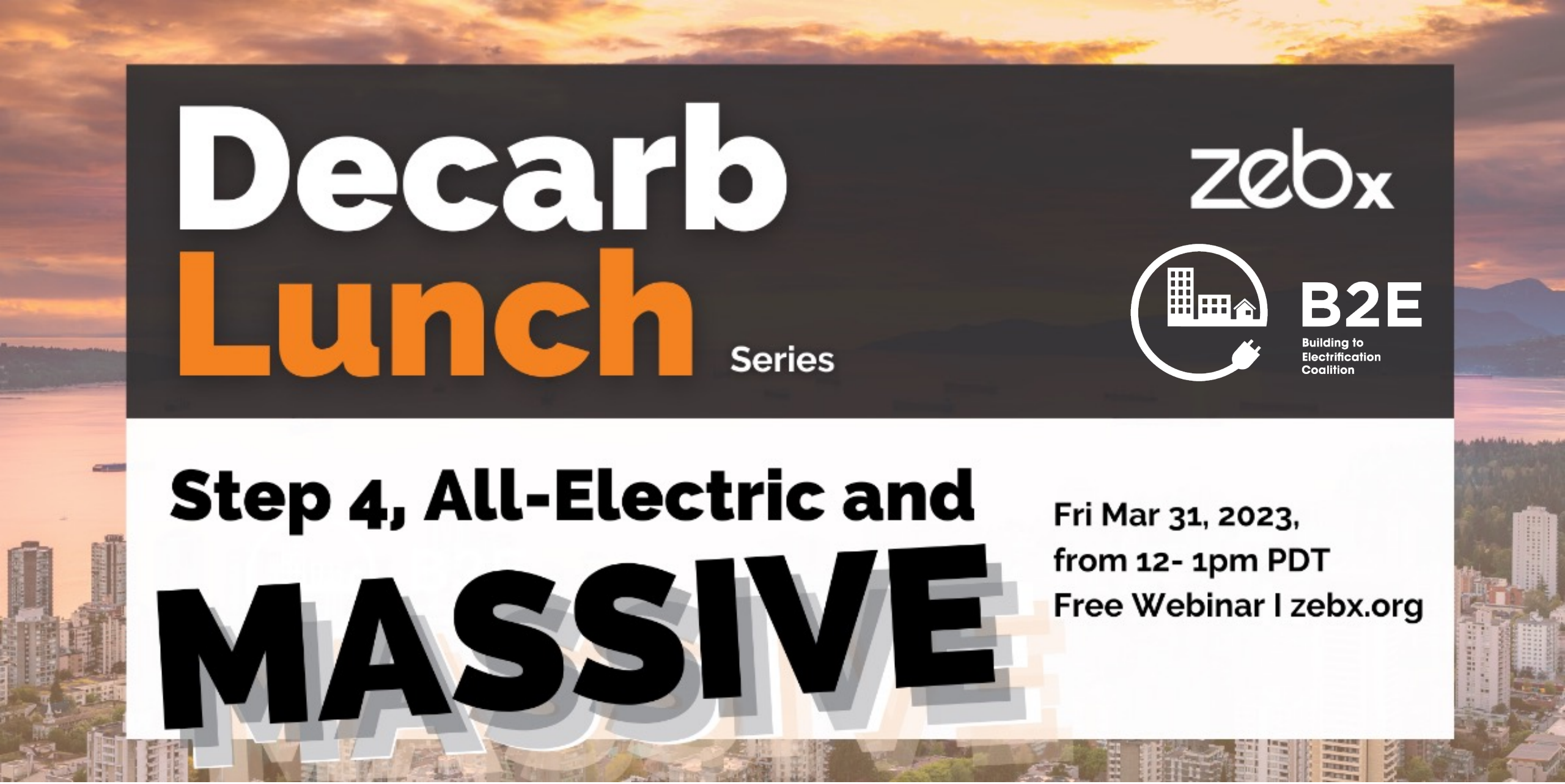

CITY OF VANCOUVER

mood provided by: Saxon Monte
song: Lickshot

BC Hydro
Power smart


The Zero Emissions
Building Exchange
zebx
Podcast

RESOURCES

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- [ ] CleanBC Net Zero Energy-Ready Challenge Winners
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- [ ] Mechanical
- [ ] Building Enclosure
- [ ] Solar Energy
- [ ] Geothermal
- [ ] Domestic Hot Water Heat Pump

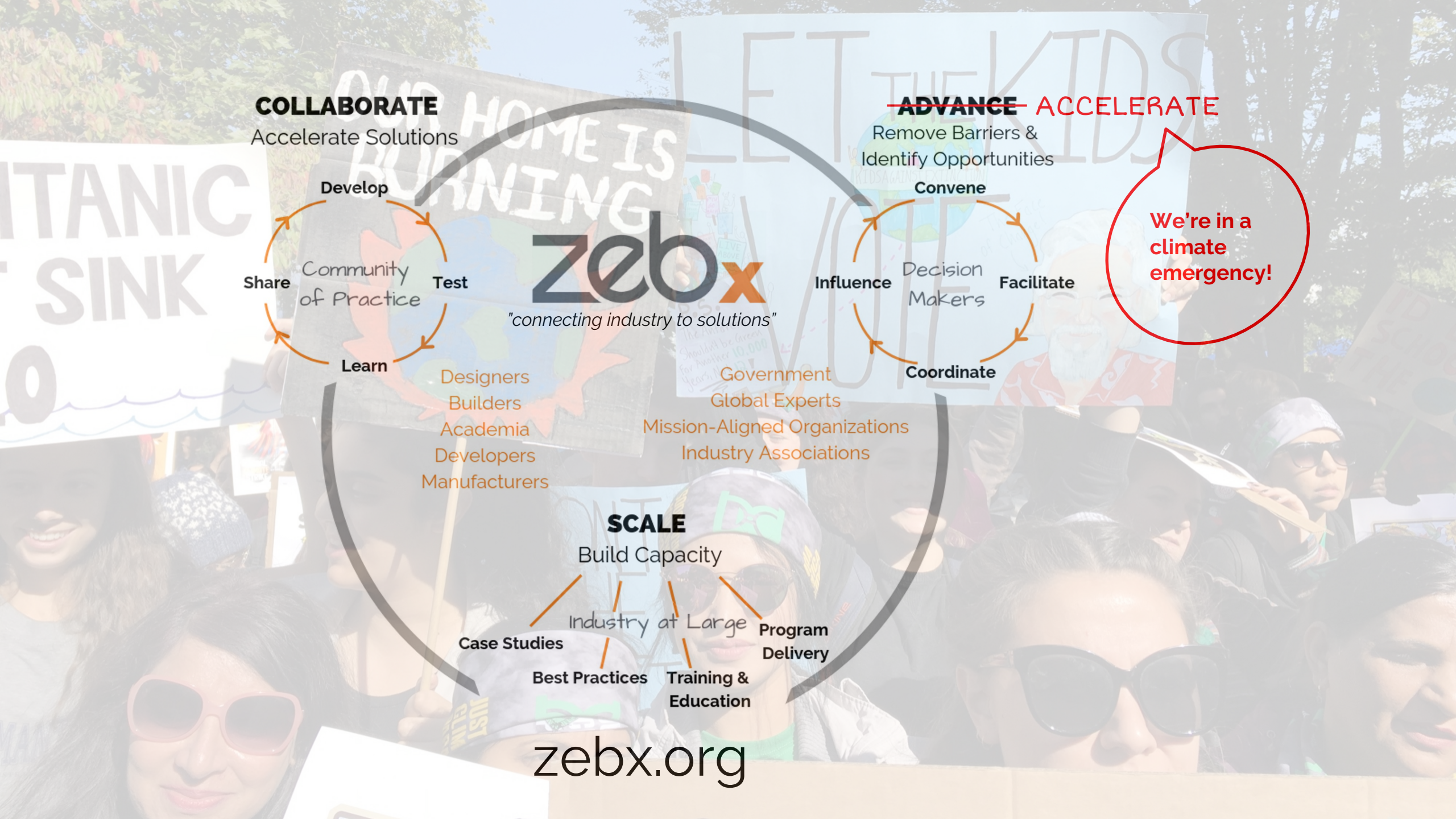
Subjects

Reset all | Podcasts ×

Decarb Lunch: Nov 2022, The OSO Residential Development

Decarb Lunch: Oct 2022, UBC's Latest & Greatest: Passive House, All-Electric and Solar

Decarb Lunch: Sep 2022, Getting Unstuck: Homeowner and Contractor perspectives on home electrification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We're in a climate emergency!
Designers
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SCALE
Build Capacity
Industry at Large
Case Studies
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zebx.org

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.

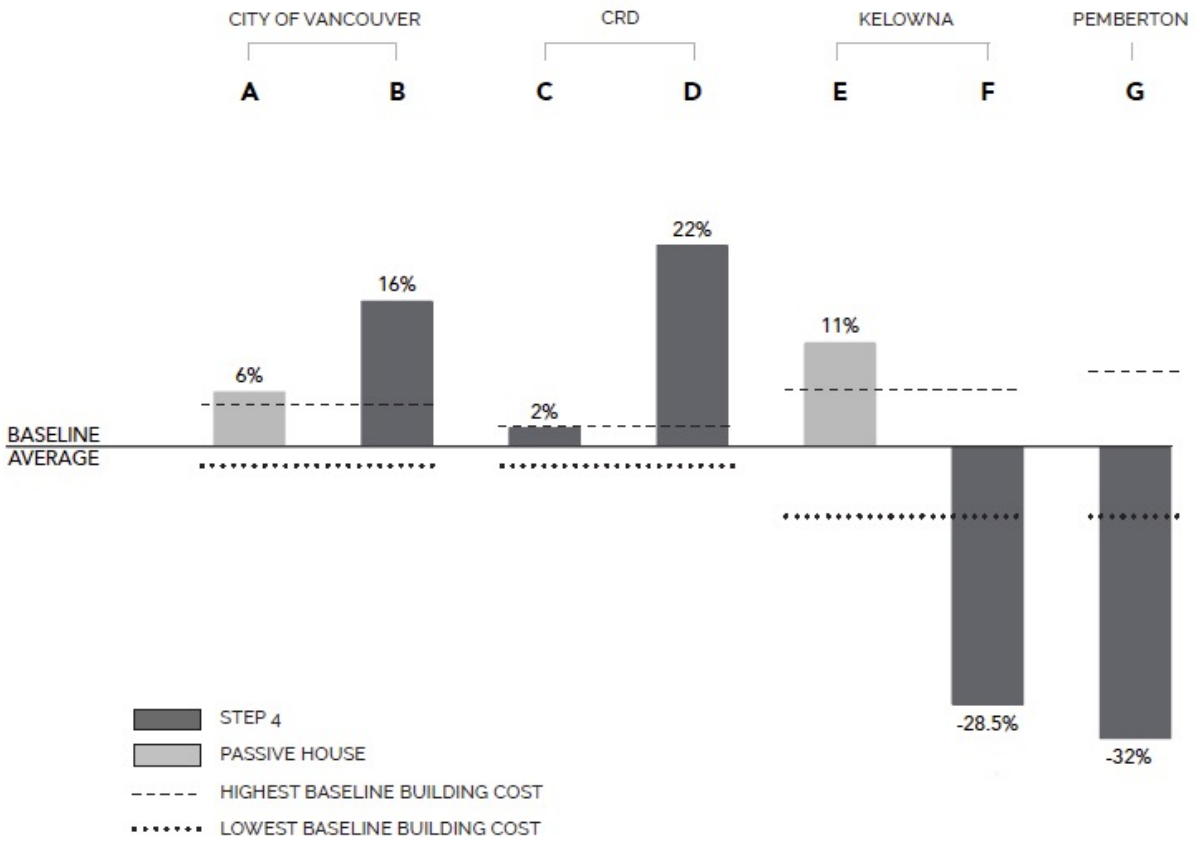
b2electrification.org

clfvancouver.com

zebx

Does it really cost more to build a high-performance building? Historically, this question has been addressed with theoretical studies, but nothing beats having the actual data. ZEBx, in partnership with BTY Group and seven builders from across BC, has completed a cost analysis of seven high-performance, wood-framed, mid-rise, multi-unit residential buildings that meet Step 4 of the Energy Step Code or the Passive House standard. The results of the study may surprise you!

OVERALL COST COMPARISON



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Decarb Lunch Series

zebx

The OSO Residential Development

Thu Dec 1, 2022,
from 12- 1pm PST
Free Webinar I zebx.org

INTEGRAL

VIDORRA DEVELOPMENTS

CITY OF VANCOUVER

BC Hydro
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CASE STUDY

What makes the OSO residential development in Golden BC impressive is not just the fact that the buildings are all-electric (climate-friendly), energy-efficient (top step of the BC Energy Step Code), and climate-resilient, but also how they were constructed in a highly cost-effective way. This had a lot to do with the developer/builder that has several high-performance building projects under its belt. Check out our most recent, in-depth case study on this finalist of the CleanBC Net-Zero Energy-Ready Challenge.

CASE STUDY

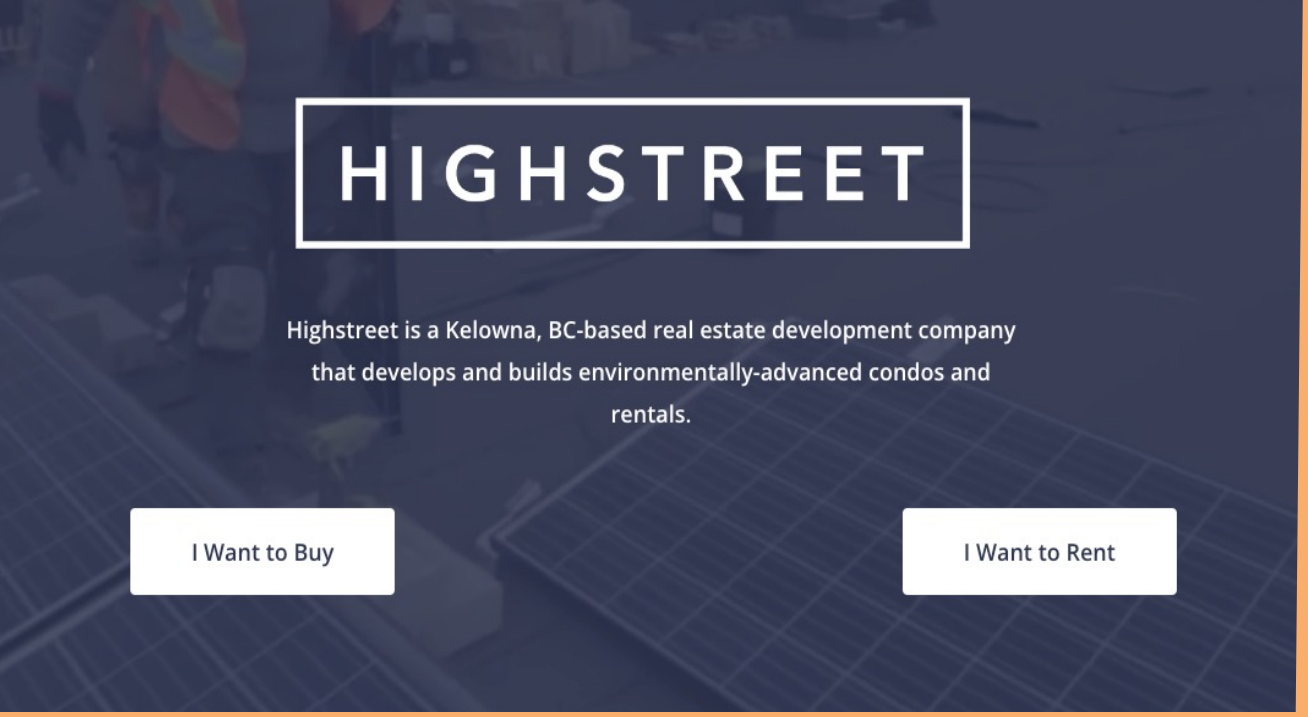
Carrington View

Net-Zero Energy-Ready Challenge Winners Series

May 2021

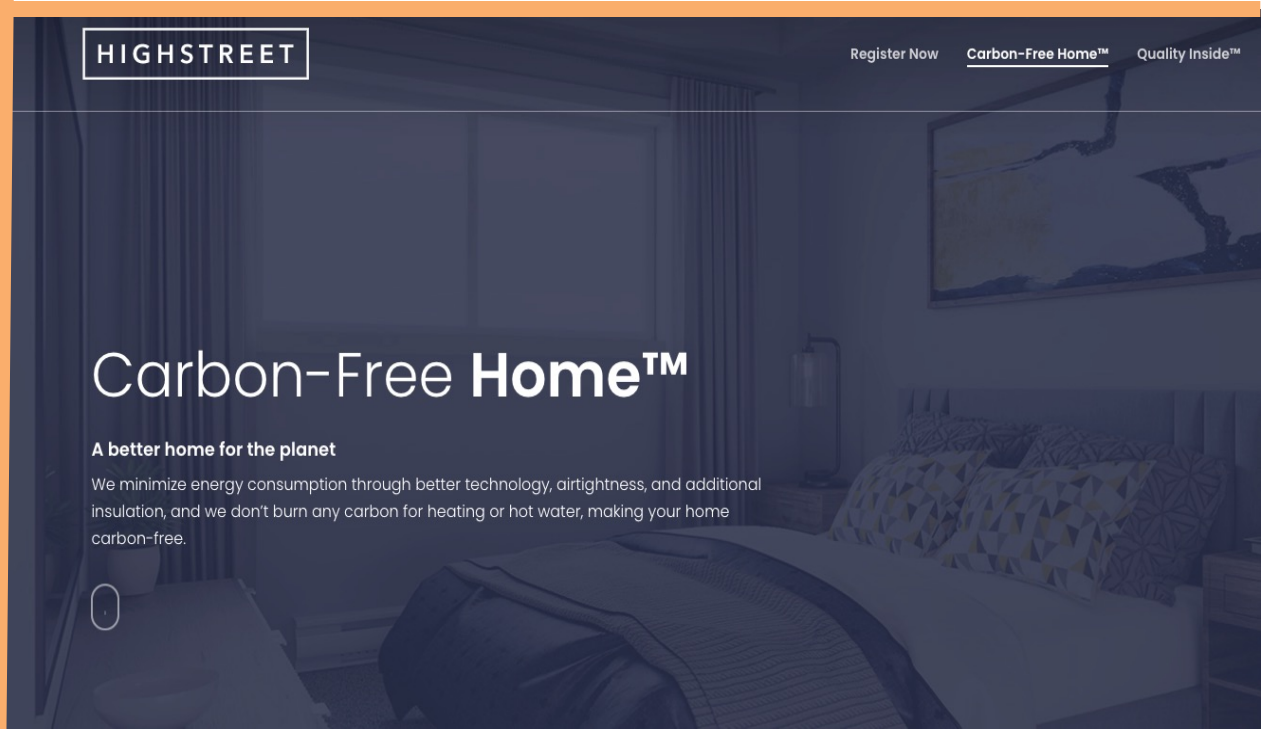
zebx

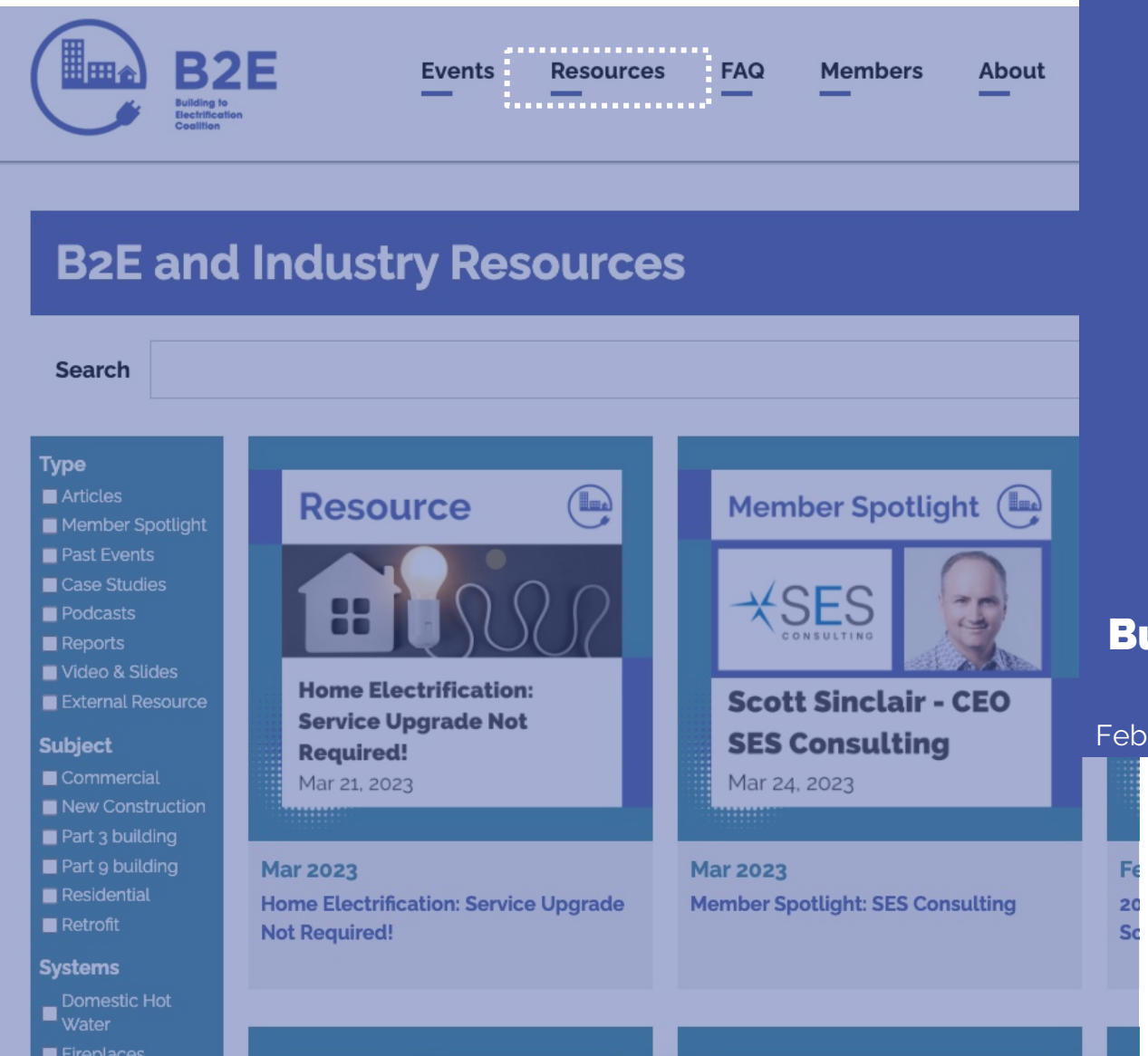
Designing and building an all-electric building can be done in a variety of ways with readily available mechanical equipment, but combining this objective with an aim to achieve Step 4 of the BC Energy Step Code in Kelowna's climate (Climate Zone 5) in a cost-effective way required a new approach for Highstreet Ventures. Read about the Carrington View building in our third case study from the CleanBC Net Zero Energy-Ready Challenge Winners Series

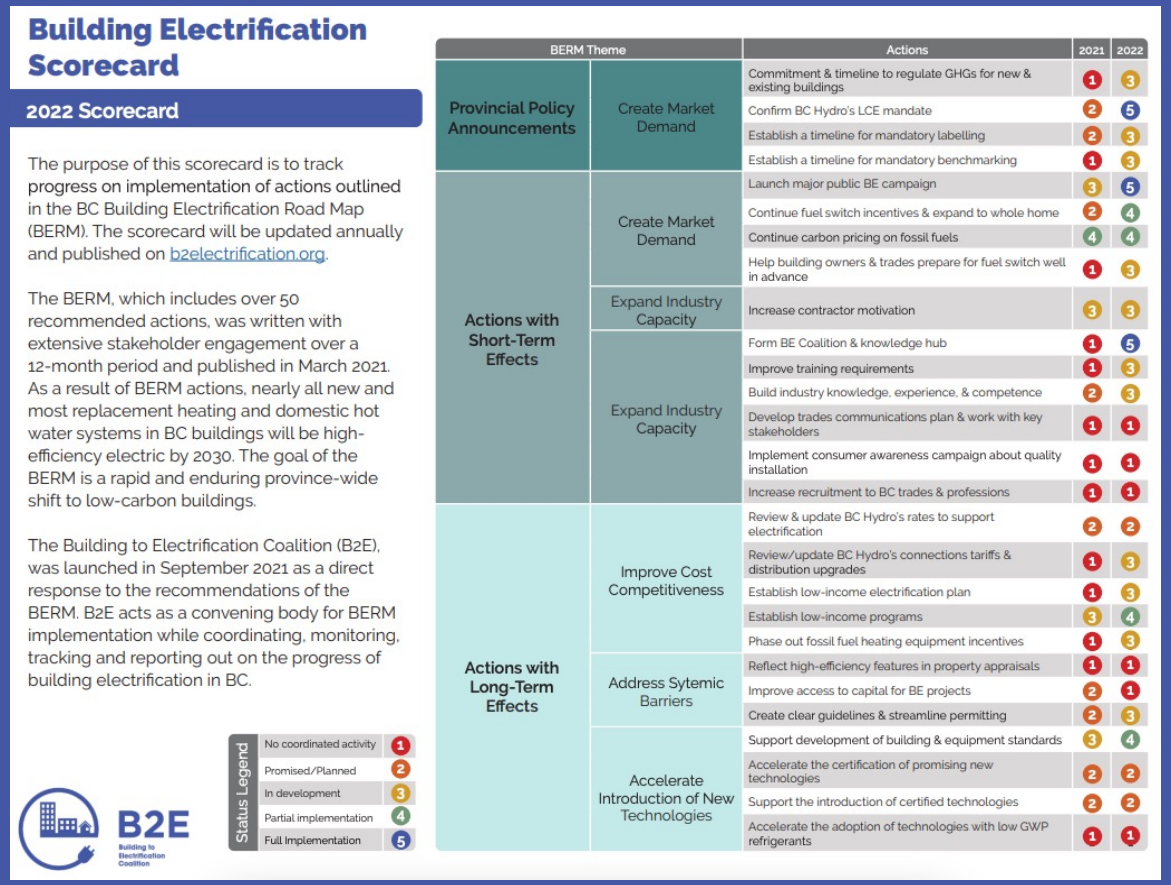


If Highstreet Ventures can build climate-friendly, energy-efficient and climate-resilient buildings for less than the cost of a code-minimum equivalent building, why aren't more developers following their lead?

If we know that this accomplishment is possible, do other developers have a societal responsibility to at least try and achieve the same outcome?







Building Electrification Scorecard

2022 Scorecard

The purpose of this scorecard is to track progress on implementation of actions outlined in the BC Building Electrification Road Map (BERM). The scorecard will be updated annually and published on b2electrification.org.

The BERM, which includes over 50 recommended actions, was written with extensive stakeholder engagement over a 12-month period and published in March 2021. As a result of BERM actions, nearly all new and most replacement heating and domestic hot water systems in BC buildings will be high-efficiency electric by 2030. The goal of the BERM is a rapid and enduring province-wide shift to low-carbon buildings.

The Building to Electrification Coalition (B2E), was launched in September 2021 as a direct response to the recommendations of the BERM. B2E acts as a convening body for BERM implementation while coordinating, monitoring, tracking and reporting out on the progress of building electrification in BC.

B2E
Building to Electrification Coalition

Status Legend	
No coordinated activity	1
Promised/Planned	2
In development	3
Partial implementation	4
Full Implementation	5

BERM Theme		Actions	2021	2022
Provincial Policy Announcements	Create Market Demand	Commitment & timeline to regulate GHGs for new & existing buildings	1	3
		Confirm BC Hydro's LCE mandate	2	5
		Establish a timeline for mandatory labelling	2	3
		Establish a timeline for mandatory benchmarking	1	3
Actions with Short-Term Effects	Create Market Demand	Launch major public BE campaign	3	5
		Continue fuel switch incentives & expand to whole home	2	4
		Continue carbon pricing on fossil fuels	4	4
		Help building owners & trades prepare for fuel switch well in advance	1	3
	Expand Industry Capacity	Increase contractor motivation	3	3
	Expand Industry Capacity	Form BE Coalition & knowledge hub	1	5
		Improve training requirements	1	3
		Build industry knowledge, experience, & competence	2	3
		Develop trades communications plan & work with key stakeholders	1	1
		Implement consumer awareness campaign about quality installation	1	1
		Increase recruitment to BC trades & professions	1	1
Actions with Long-Term Effects	Improve Cost Competitiveness	Review & update BC Hydro's rates to support electrification	2	2
		Review/update BC Hydro's connections tariffs & distribution upgrades	1	3
		Establish low-income electrification plan	1	3
		Establish low-income programs	3	4
		Phase out fossil fuel heating equipment incentives	1	3
	Address Sytemic Barriers	Reflect high-efficiency features in property appraisals	1	1
		Improve access to capital for BE projects	2	1
		Create clear guidelines & streamline permitting	2	3
	Accelerate Introduction of New Technologies	Support development of building & equipment standards	3	4
		Accelerate the certification of promising new technologies	2	2
		Support the introduction of certified technologies	2	2
		Accelerate the adoption of technologies with low GWP refrigerants	1	1

Building Electrification Scorecard

February 2022

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B2E
Building to Electrification Coalition

Events Resources

B2E and Industry Resources

Type
- Articles
- Past Events
- Case Studies
- Podcasts
- Reports
- Video & Slides
- External Resource

Subject
- Commercial
- New Construction
- Part 3 building
- Part 9 building
- Residential

Case Study

Orion: Real-Life Performance of a Step 4, All-Electric Building
Nov 24, 2022

Nov 2022

Ravens Crossing: How a Community Went All-Electric
Sep 9, 2022

Sep 2022

Ravens Crossing: How a Community Went All-Electric

September 2022

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Orion: Real-Life Performance of a Step 4, All-Electric Building

November 2022

HIGHSTREET

Step 4, All-electric, and Massive

Mike Kristiansen | March 2023

OUTLINE

- Highstreet's Evolutionary Path
- Skaha Shores Multi-family Development
- An Energy Modeler's Perspective
- Constructing Skaha Shores to Step 4
- Post Occupancy

HIGHSTREET

HIGHSTREET OVERVIEW

- We develop, build, sell, and operate quality condos and rentals
- Focus on sustainable buildings and creating community connections
- Currently building net-zero energy ready developments (BC Energy Step Code 4)

HIGHSTREET

DECISION MAKING AT HIGHSTREET

Values

Proforma

Dev/Con/Ops

Pro Forma Summary

CONSTRUCTION BUDGET, COST TO DATE & COST TO COMPLETE SUMMARY

			P1 - South		
		DOORS	DOORS	SQ FT	
		136	136	148,219	
COST CODE	DESCRIPTION	PRO FORMA PROJECT BUDGET (allocated to 148,219 sq ft)	UPDATED PROJECT BUDGET (Phase 1-South)	COST PER DOOR	COST PER FT
09-0000	FINISHES	3,093,848	4,510,000	33,162	30.43
10-0000	SPECIALITIES			-	-
10-1400	Signage & Fire Accessories	19,307	40,000	294	0.27
10-2200	Wire Mesh Enclosures		70,000	515	0.47
10-5500	Postal Specialties	25,962	20,000	147	0.13
10-5600	Shelving, Mirrors & Showers Doors	60,579	140,000	1,029	0.94
10-6000	Blinds	24,823	105,000	772	0.71
10-0000	SPECIALITIES	130,671	375,000	2,757	2.53
11-0000	EQUIPMENT			-	-
11-3000	Residential Appliances	645,409	675,000	4,963	4.55
11-3100	Roof Anchors / Fall Arrest System			-	-
11-0000	EQUIPMENT	645,409	675,000	4,963	4.55
14-0000	CONVEYING SYSTEMS			-	-
14-2000	Elevator	296,164	265,000	1,949	1.79
14-0000	CONVEYING SYSTEMS	296,164	265,000	1,949	1.79
[illegible]	RE SUPPRESSION			-	-
[illegible]	kler System	344,770	360,000	2,647	2.43
[illegible]	SUPPRESSION	344,770	360,000	2,647	2.43
[illegible]	MBING			-	-
[illegible]	ng & HVAC	3,999,330	5,600,000	41,176	37.78
22-0000	PLUMBING	3,999,330	5,600,000	41,176	37.78
26-0000	ELECTRICAL			-	-
26-0500	Electrical	1,654,895	2,700,000	19,853	18.22
26-0000	ELECTRICAL	1,654,895	2,700,000	19,853	18.22
28-0000	ELECTRONIC SAFETY & SECURITY			-	-
28-0500	Security	56,680	70,700	520	0.48
28-0000	ELECTRONIC SAFETY & SECURITY	56,680	70,700	520	0.48
31-0000	EARTHWORK			-	-
31-1000	Site Prep	1,168,206	929,710	6,836	6.27
31-3000	Building Excavation & Fills	270,441		-	-
31-3050	Geotechnical Improvements & Structure	108,176	-	-	-
31-3100	Building Under SOG Plumbing & Electrical	98,541	140,000	1,029	0.94
31-3150	SOG Prep	173,092	170,000	1,250	1.15
31-7110	Blasting	-	-	-	-
31-0000	EARTHWORK	1,806,446	1,239,710	9,116	8.36
32-0000	EXTERIOR IMPROVEMENTS			-	-
32-1250	Asphalt & Concrete Flatworks	491,428	971,747	7,145	6.56
32-3213	Retaining Walls	1,350,000	784,168	5,768	5.29
32-9000	Planting & Landscaping	494,744	378,900	2,786	2.56
32-9050	Exterior Furnishings	12,381	36,000	265	0.24
32-9060	Garbage & Recycle Bins	64,906	125,000	919	0.84
32-0000	EXTERIOR IMPROVEMENTS	2,404,059	2,295,815	16,881	15.49

HIGHSTREET

EVOLUTION

2005: Scott Butler started Highstreet with 1 condo project on Vancouver Island

2008: Started using triple pane windows, heat pumps, and rainwater reuse

2016: Started construction company

2017: Set company-based sustainable direction and goal to be leaders in the industry

2017: Emphasis on envelope details at Neo

2018: Started using ECMs early at Creekview Heights

2019: First net-zero energy ready building broke ground, Carrington View in West Kelowna

2019-2021: Skaha Shores project

Present: 605 net-zero ready homes built (West Kelowna, Penticton, Langford, Comox)

HIGHSTREET

A PERFORMANCE-BASED DESIGN

Set Targets

- 2018/2019 Establish performance targets and energy budgets for consulting engineers

Creative Design

- Allow creative freedom in designs to meet aggressive targets

Testing

- Energy Modeling
- Thermal Modeling
- Infiltration Testing

HIGHSTREET

SKAHA SHORES &
THE CITY OF PENTICTON

CoP – Pillars of the Community Climate Action Plan

- OCP direction toward sustainable design
- No requirement for Step Code
- Municipal incentives
- FortisBC Electric incentives

Skaha Shores Design Targets

- 100% electric
- Step 4 of the BC Energy Step Code
- Built Green Platinum Certified
- Energy model guided design

HIGHSTREET

Skaha Shores Energy Modelling

Projects

- 8 residential developments 2016 to 2019
- 23 multi-unit residential buildings

Goals

- Code compliance and Built Green HD
- LEED certification and NZER Challenge

Strategies

- Building envelope improvements
- Electrification
- Site renewable generation

Project info and goals

General information
- Penticton, 3350 HDD
- Multi unit residential, 180 units
- Modelled floor area 17,814 m^2
- Underground parking garage

Energy efficiency goals
- BC Energy Step Code Step 4
- No fossil fuel consumption
- Site electricity generation to supply base building loads

Design Optimization

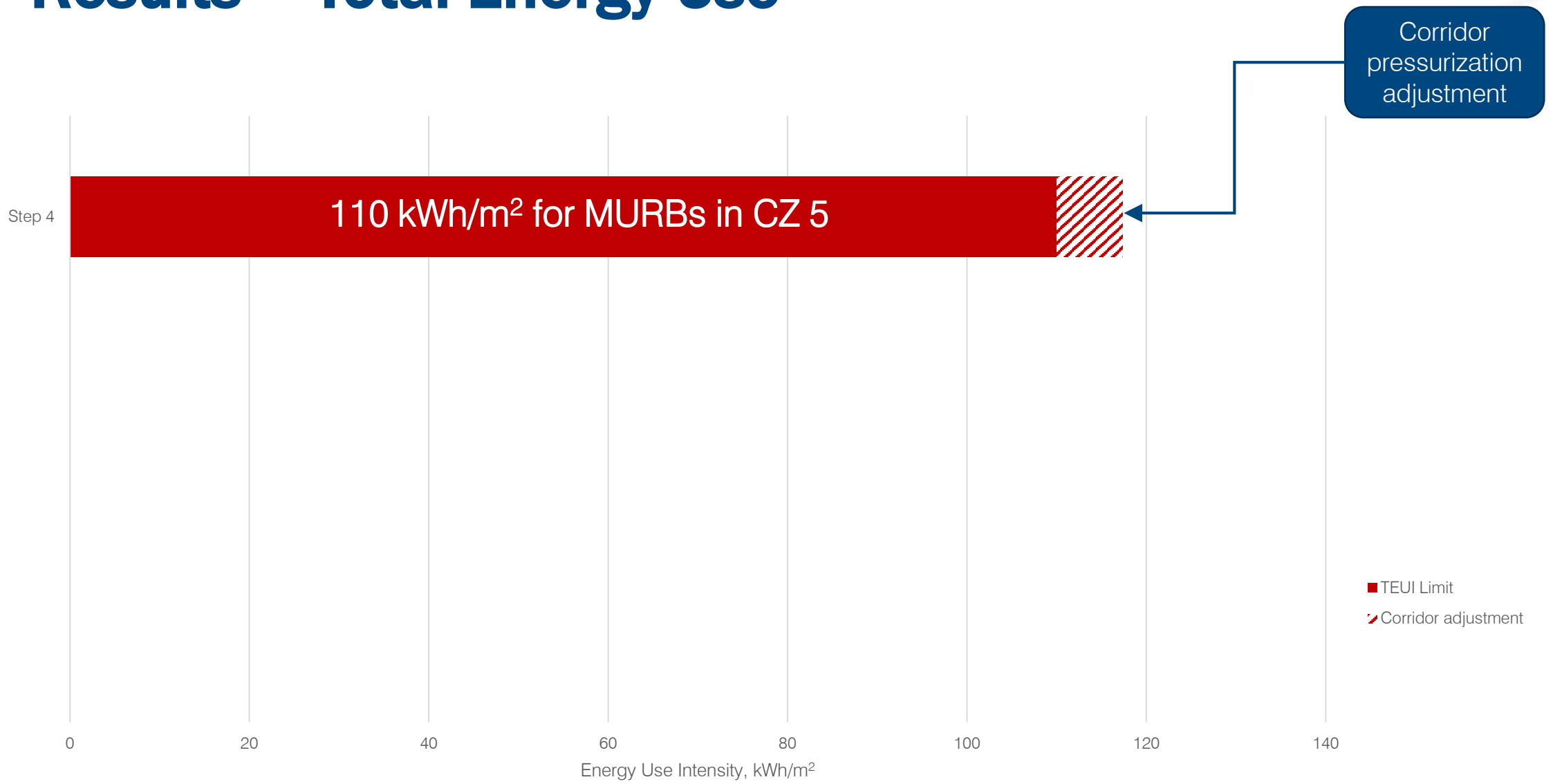
Parameter	Lower performance	Higher performance	Final design
Wall effective R-value	R18 standard	R39 SIP	R18.3
Window U-factor (USI)	0.17 (0.97)	0.17 (0.97)	0.17 (0.97)
Patio door U-factor (USI)	0.22 (1.25)	0.22 (1.25)	0.22 (1.25)
Roof effective R-value	R50	R60	R60
Parkade ceiling R-value	R10	R20	R20
Air tightness, L/s/m^2	0.25	0.05	0.096
Suite ERV effectiveness	70%	80%	80%

Designed Systems

HVAC Systems	Service Hot Water	Lighting
Suites: Split ASHPs with backup electric resistance heat and ERVs	Suites: Heat pump hot water heaters	Common area lighting power is 39% lower than NECB 2015
Corridor MUA with ASHP and backup electric resistance heat	Low flow hot water fixtures, 24% lower than code	Occupancy sensors in common areas
Electric force flows in common areas		
Unheated parkade with exhaust and transfer fans		

198 kW Solar PV

Results – Total Energy Use



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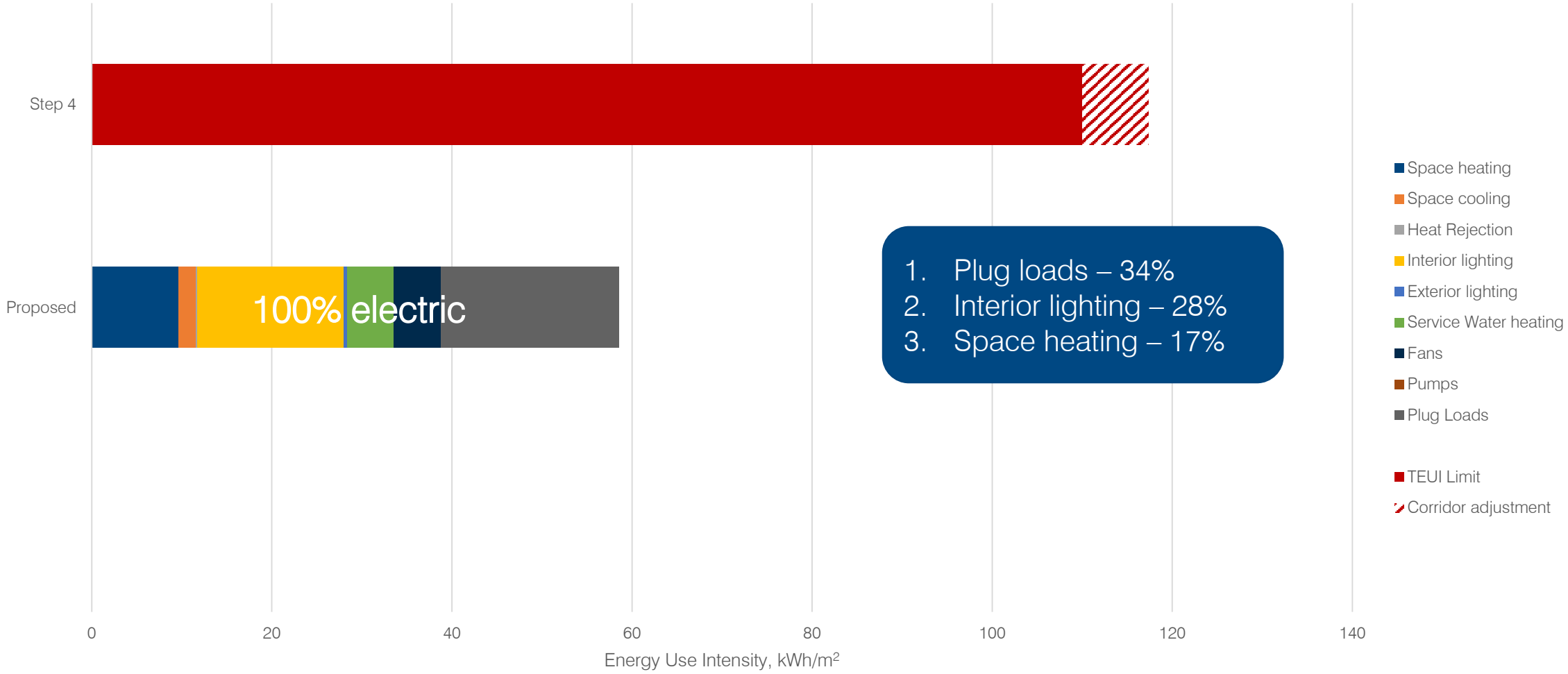
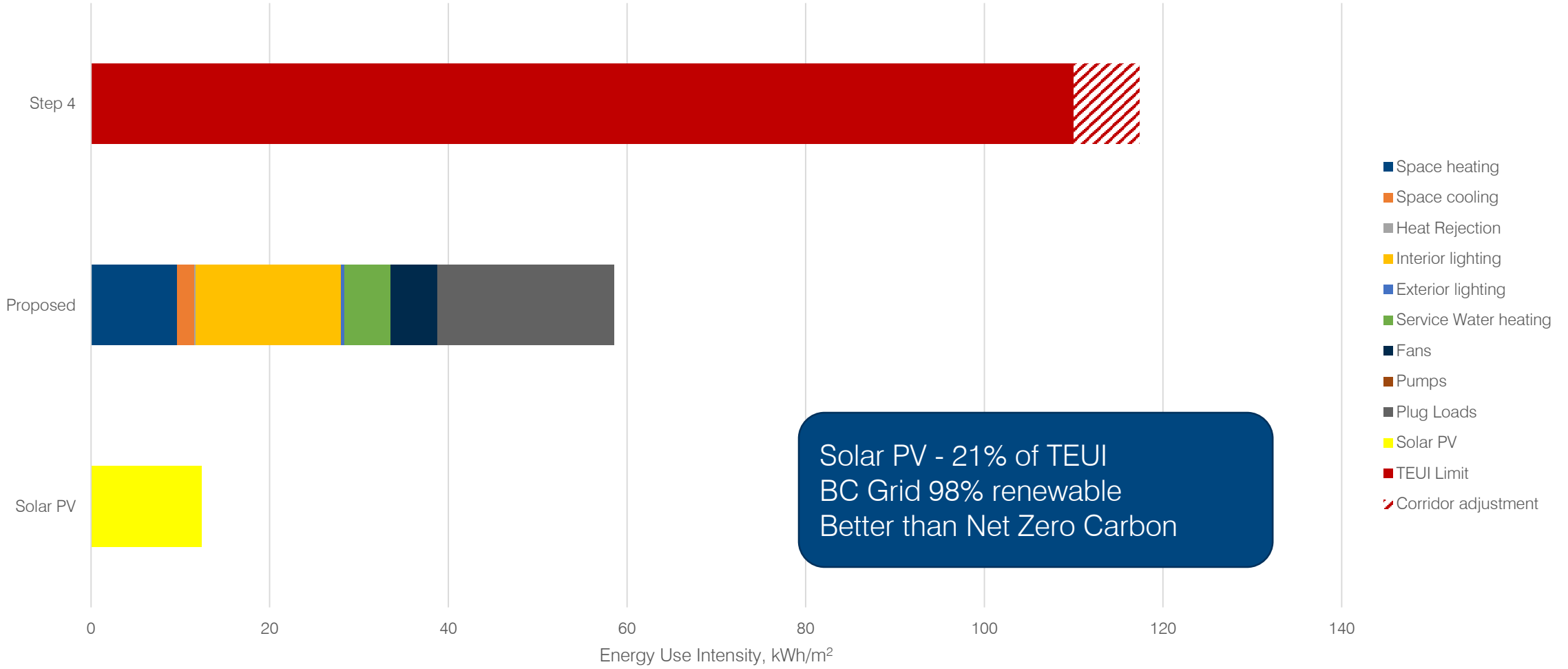
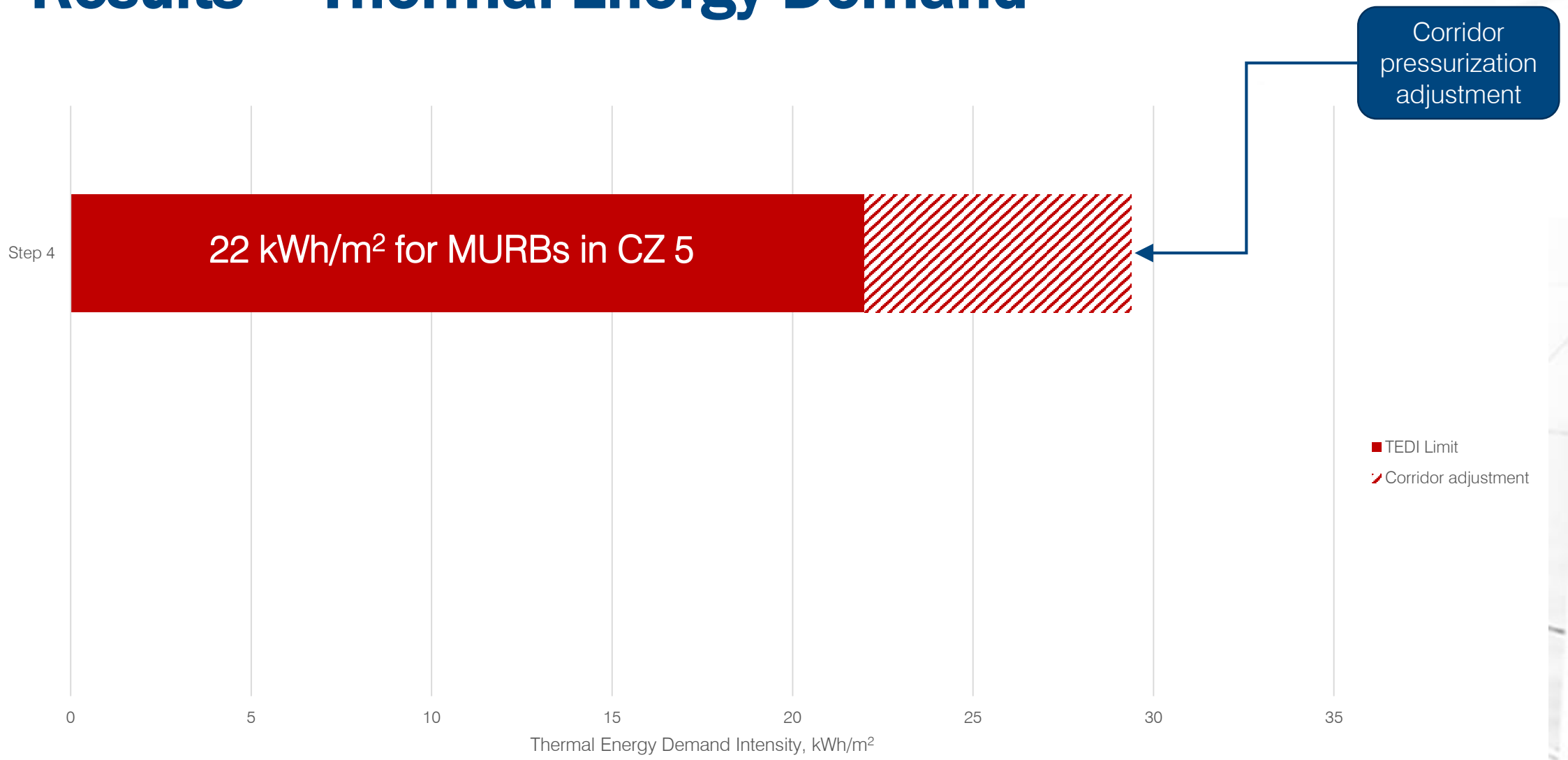


1. Plug loads – 34%
2. Interior lighting – 28%
3. Space heating – 17%

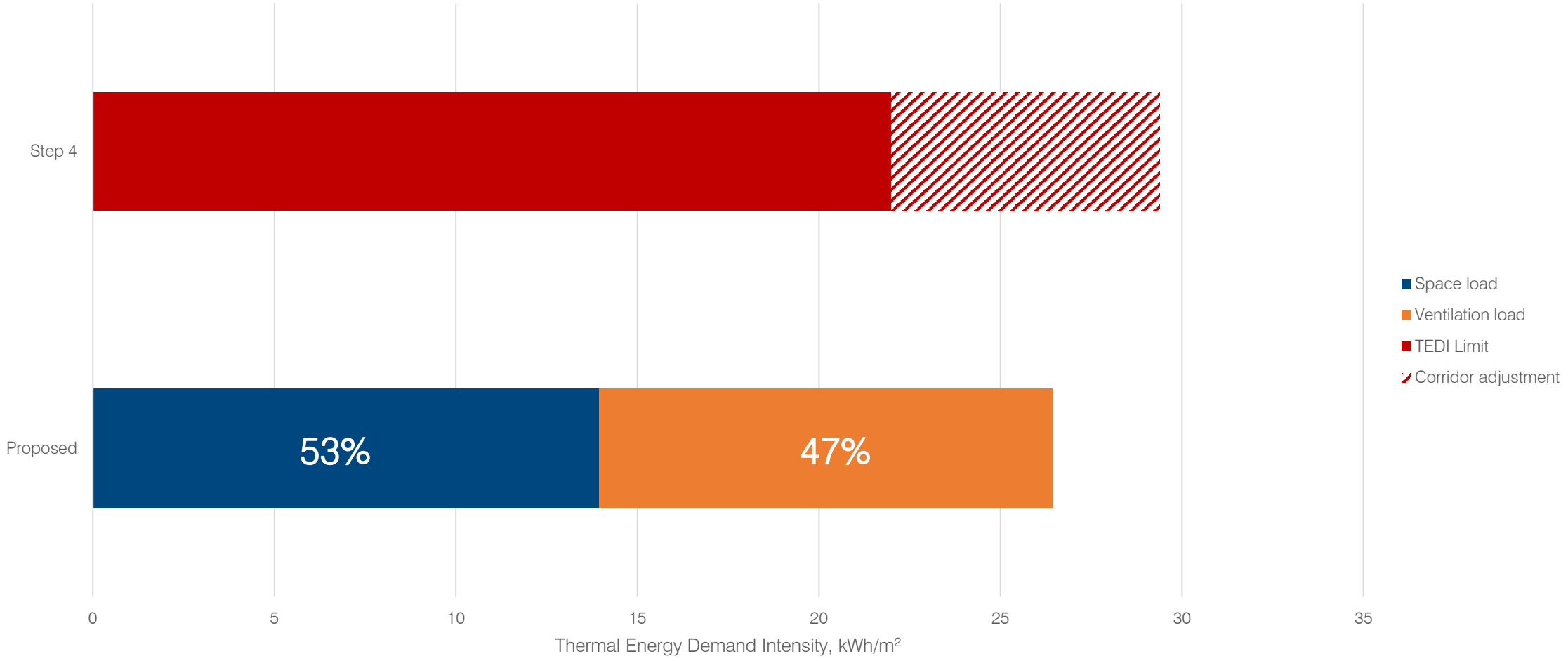
Results – Total Energy Use



Results – Thermal Energy Demand

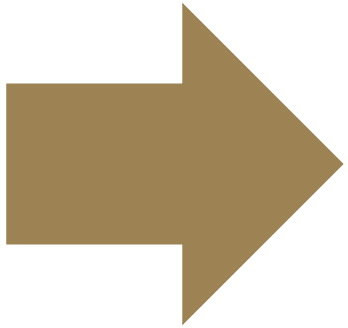


Results – Thermal Energy Demand



Next steps

Already implemented in current HSV projects
Further mitigation of thermal bridging
Better triple glazed windows
Lower corridor pressurization airflow rates
Improved ERVs
Central ASHP hot water (CO_2)



Future HSV projects
Embodied carbon targets
Enhanced air tightness
Central ERV for corridor and suite ventilation
Lower GWP refrigerants for heat pumps
EnergyStar Portfolio Manager

SKAHA SHORES CREATE DESIGN

Philosophies

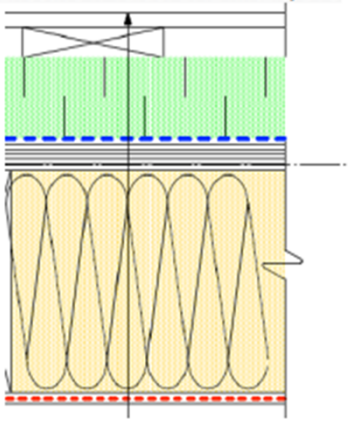
- Use proven methods and techniques
- ECMs
  - Wall insulation
  - Glazing thermal performance
  - Lighting
  - Solar
  - Boiler efficiency – central vs in suite
  - Fan/pump efficiency
  - Air source heat pump
- Blow up construction detail drawings on 11x17 paper
- Education and mockups
- Testing
- Low operating costs

HIGHSTREET

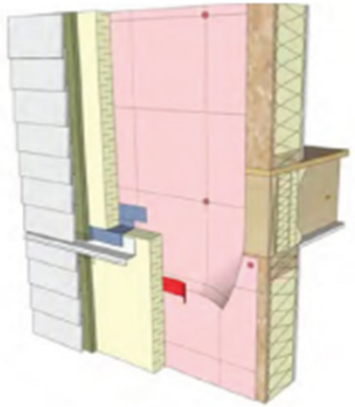
SKAHA SHORES CREATIVE DESIGN (CON'T)

Envelope Focused

R22 with 3" Exterior Split Insulation
Nominal R-Value: 34.6 h.ft2.F/BTU
Effective R-Value: 17.1 h.ft2.F/BTU

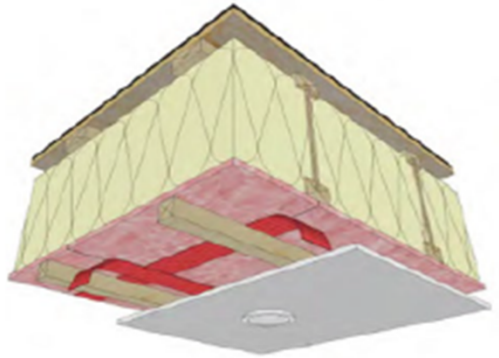


Above-Grade Wall Exterior Air Barrier System



Sheathing Membrane

Roof – Sealed Interior Sheathing Air Barrier with Service Cavity

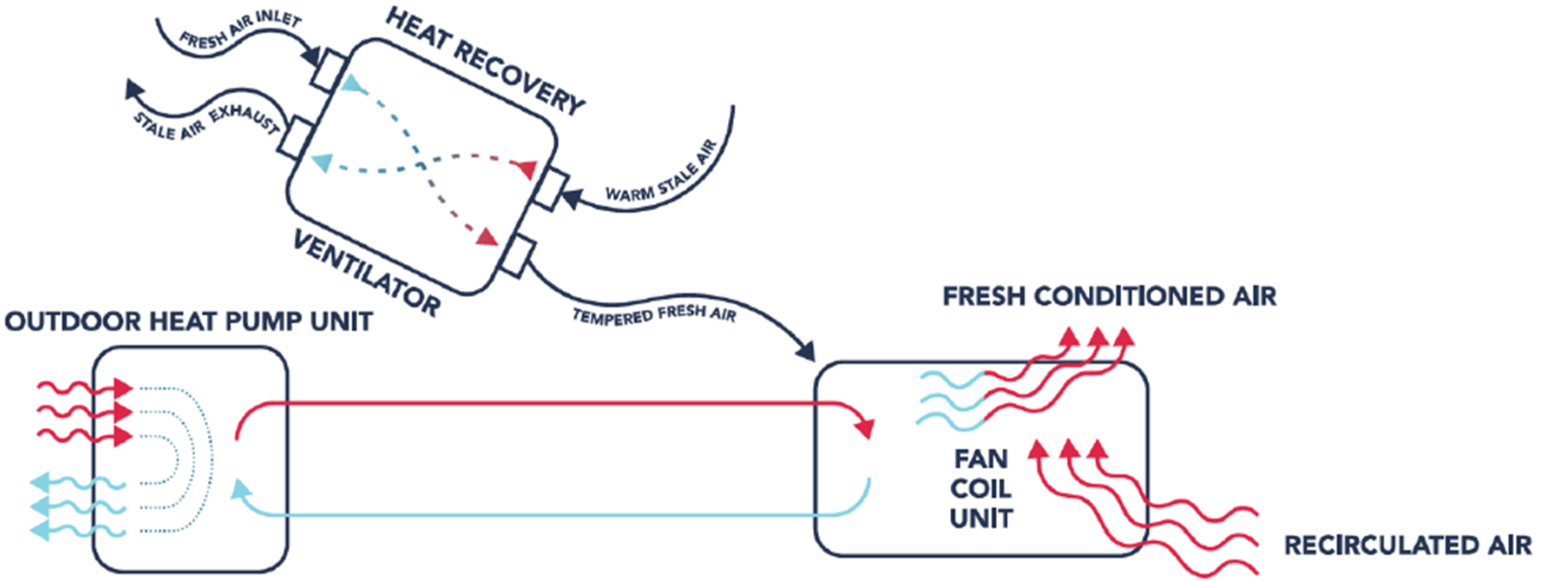


Sealed Interior Sheathing

HIGHSTREET

SKAHA SHORES CREATIVE DESIGN (CON'T)

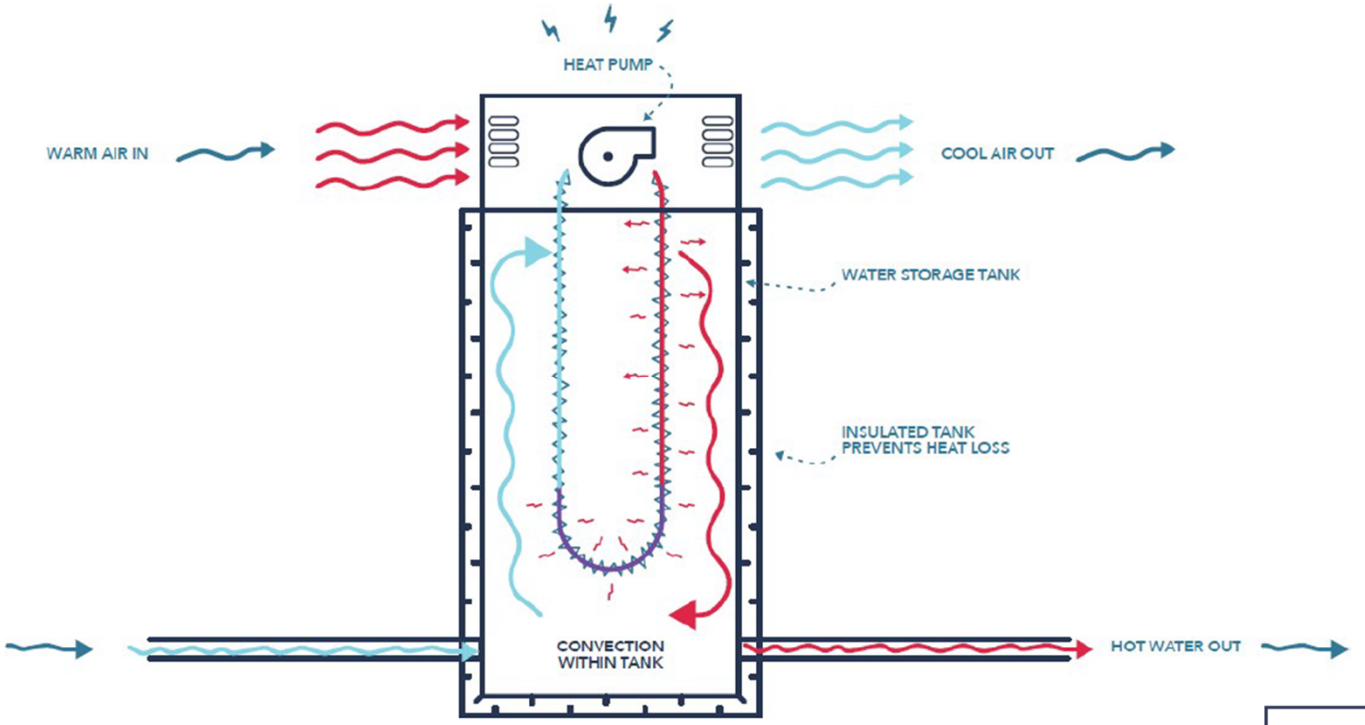
Systems Thinking - HVAC



HIGHSTREET

SKAHA SHORES CREATIVE DESIGN (CON'T)

Systems Thinking - DHW



HIGHSTREET

OPERATING A STEP-4 BUILDING

- Solar and insulation - Low common area electrical utility bills in summer

NEW CHARGES			
Electric - Consumption	6000 x	$0.1121	672.60
Electric - Basic Charge			16.34
Water - Basic Charge 2 inch			318.98
Water - Consumption	16880 x	$0.0219	369.67
Sewer - Basic Charge			323.61
Electric - Generated	16680 x	$0.1121	1,869.83CR
Current Charges			**227.67CR**
Account Balance			**$2,922.67CR**

- ERVs - Frequent filter changes vs low energy cots/comfort
- Educating residents – ERVs, Lighting, HWT, Condensing dryer
- Operating programs – Compost in community garden, electronics recycling,

HIGHSTREET