## Building Electrification Road Map

### LAUNCH EVENT

Photo: iStock

April 21st, 2021

## Launch Agenda

#### 1. Key features of the Road Map

• Tom Berkhout, BC Hydro

#### 2. Ongoing work supporting implementation

- Sean Pander, City of Vancouver
- Coral Buitenhuis, Technical Safety BC
- Robyn Wark, BC Hydro
- George Benson, Vancouver Economic Commission

#### 3. Next steps for implementation

• Roberto Pecora, ZEBx

### Key Features of the Road Map

Photo: iStock

## What is the Road Map?

- Proposed pathway to achieve a low-carbon building sector over the next 10 years through building electrification
- **Collaborative plan** both in terms of its development and implementation
  - 2 all day workshops
  - Multiple subject matter expert interviews
  - Four focus groups
  - Supply chain email survey
  - Stakeholder feedback survey on penultimate draft

#### Action Oriented

- What: Scalable strategies and actions
- When: Specific timeline
- Who: Key organizations identified

### **Steering Committee Members**









# Why Buildings?

#### **Buildings** account for of total emissions 11% in British Columbia of total emissions 30 to for many 60% **British Columbia** municipalities

The building sector, unlike transportation and oil and gas, is regulated entirely by provincial and local governments. It, therefore, represents one of the most straightforward opportunities for a rapid transition to a low-carbon market sector.

## Provincial 2030 Sectoral GHG Reduction Targets

Transportation – 27% to 32%

Industry – 38% to 43%

Oil and Gas – 33% to 38%

Buildings and Communities – 59% to 64%

# **Electrification is a Key Strategy for BC's Climate Plan**



"To meet our goals we must increase our use of cleaner energy, especially electricity, in our lives and in key sectors of our economy – shifting away from our reliance on fossil fuels for transportation, industry and housing."

#### - CleanBC Plan

### **Building Sector GHG Emissions**

Figure 1 Distribution by end-use of GHG emissions in BC's Residential & Commercial/Institutional Building Sectors



97% of operational building sector GHG emissions come from space and water heating



## **Road Map Vision**

By 2030, nearly all new and most replacement space heating and domestic hot water systems in BC's homes and buildings will be high-efficiency electric, in pursuit of a province-wide shift to lowcarbon buildings

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### **Market Transformation Thinking**



Market Penetration

## **Whole Building Electrification**



Source: Edison International. https://www.edison.com/home/innovati on/building-electrification.html

### **Five Core Road Map Strategies**



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#### OBJECTIVE

Demonstrate provincial leadership through messaging and market signals

Create Market Demand



 Set a minimum energy performance standard of co-efficient of performance (COP) > 1 by 2035 for space and water heating equipment

### **KEY ACTIONS**

- Provincial policy commitments & timeline (Action 1.1)
- General marketing campaign (Action 1.4)
- GHG performance reporting & disclosure (Actions 1.7)
- GHG performance requirements development (Action 1.5)
- Enable local government leadership (Action 1.6)

### **Recommended Regulatory Timeline: New Construction**

#### GHG Added to Energy Step Code

GHG requirement added to the BC Building Step Code and Province announces zero emissions timeline.

#### **Province-wide GHG** requirements start

First step of provincewide minimum GHG requirement comes into effect.



### **Recommended Regulatory Timeline: Existing Buildings**

#### Provincial Timeline Announced

Provincial Government indicates its intention to regulate GHG emissions for existing buildings and timeline to near-zero.

#### Local Governments Opt-in to GHG Requirements

Province permits and supports local governments to begin adopting GHG requirements for existing buildings.

#### Province-wide Near Zero GHG Emissions Requirement

Most existing buildings are required to be near zero emissions at time or major retrofit

#### All Buildings are Zero Emissions

Most existing buildings are required to be near zero emissions

• 2022		2024		20	)35	•
2021	2	023	2	032	2	045

#### Mandatory Energy Benchmarking & Labelling

Province-wide mandatory energy benchmarking and labeling comes into effect

#### **Province-Wide Minimum GHG Requirements Come Into Effect**

First step of province-wide minimum GHG requirements come into effect for most existing buildings.

#### Federal Provincial Equipment Standard: COP>1

All space and water heating equipment sold in British Columbia must have a minimum coefficient of performance that is greater than 1 (effectively requires heat pumps to be used)

## **Consistent Approaches**

#### • City of Vancouver:

- Zero Emissions Building Plan
- Zero Emissions Building Retrofit Plan

#### Metro Vancouver Regional District:

• Draft Climate 2050 Buildings Roadmap

#### Help Cities Lead Campaign

- Five specific local government regulatory requests
- Endorsed by more than 25 BC municipalities since January 2021

#### Provincial Mandate Letters

- GHG emissions requirement for new buildings
- Home energy labelling

#### OBJECTIVE

Improve Cost Competitiveness



- Reduce equipment and whole building capital costs
- Level the playing field between natural gas and electric operational costs
- Reduce electricity connection and system upgrade fees
- Address housing affordability and building electrification
- Reduce transactional costs for consumers

### **KEY ACTIONS**

- Whole building electrification incentives (Action 2.1)
- Phasing out natural gas incentives on equipment (Action 2.5)
- Electrification utility rates & service fees (Actions 2.2, 2.3, 2.6, 2.12)
- Simplify electrification process for owners (Action 2.10, 2.11)

Address

Systemic

Barriers

### OBJECTIVE

- Reflect high-efficiency features more accurately in property appraisals
- Reduce landlords' legal barriers to undertake electrification retrofits
- Ensure buildings connected to district energy systems can decarbonize
- Improve access to capital
- Reduce permitting complexity and time for new heat pump systems

### **KEY ACTIONS**

- Home financing property appraisal processes (Action 3.1)
- Rental property investment barriers (Actions 3.2 and 3.3)
- Natural gas district energy systems decarbonization timeline (Acton 3.4)
- Alternative financing mechanisms (Action 3.5)
- Streamlined permitting (Action 3.6)

Expand

Industry

Capacity

### OBJECTIVE

- Expand the electrification sales force
- Improve building electrification awareness, coordination, and advocacy
- Build industry knowledge and competence
- Expand the use of trade certifications and energy performance guidelines
- Support growth in the number of people in the building electrification trades sector

### **KEY INITIATIVES**

- Upstream offers for contractors (Action 4.2)
- Targeted industry messaging (Actions 4.4 and 4.5)
- Training programs and subsidies (Action 4.7)
- Design guidelines and training (Action 4.9, 4.10, and 4.13)
- HVAC certification (Action 4.14 and 4.15)
- Electrification trades enrollment campaign (4.16 and 4.17)

Photo: iStock

### OBJECTIVE

- Support the development of building and equipment standards
- Accelerate the certification of promising new technologies
- Support the introduction of already certified technologies
- Accelerate the adoption of low Global Warming Potential refrigerants
- Expand the North American market for building electrification

### **KEY ACTIONS**

- Development of building and equipment standards (Actions 5.1 and 5.2)
- Certification support for promising new technologies (Actions 5.4, 5.5. and 5.6)
- Accelerate pilot studies, M&V and case studies (Actions 5.7 and 5.8)
- Increase demand for low GWP technologies (Actions 5.9, 5.10, and 5.11)
- North American market for building electrification (Action 5.12)

Increase Available Technologies

Photo courtesy of City Green Solution:

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### **Critical Elements for Success**

- ✓ Provincial Government Leadership
- ✓ Strong BC Hydro Support
- ✓ Local Government Leadership
- ✓ Deep coordination with industry & supply chain
- ✓ Clear and consistent signals to the marketplace
- ✓ Focus on establishing long-term market fundamentals
- ✓ Collect, share, and use high quality information
- ✓ Act quickly and purposefully

### **The Keys to Success**









## Ongoing Work Supporting Implementation



Create Market Demand

## **City of Vancouver** *Requirements for Renewable Heat & Hot water – NEW*



- Heating demand reduced 65%-90% + smaller volumes
  = easier transition
- MURBs/Commercial = zero emissions heat 2021 Proposing zero emissions DHW in rezonings 2022
- Houses = zero emissions heat & hot water 2022
- Energy Step Code + GHGi = similar requirements across
  Lower Mainland
- Increasing overheating = heat pumps are preferred

Create Market Demand

## **City of Vancouver** *Accelerate Voluntary Electrification Retrofits*



- Better Homes BC heat pump incentives = \$3,000 + municipal matching grants up to \$6,000
- >4,900 Better Homes BC heat pump incentives through end of Feb 2021
- In Vancouver 67 heat pumps installed + 190 more registered to install
- QuadReal, City of Vancouver, Golden Properties, VanCity, Concert Properties, Health Authorities, etc. = initiated deep emission retrofits leveraging heat recovery chillers, air-towater heat pumps

Create Market Demand

## **City of Vancouver** *Develop carbon r<u>eporting</u> and <u>limits</u> for existing houses & large commercial*

- Climate Emergency Action Plan 2020: recommend requirements in 2021/2022
- Initial reporting (2023) and limits (2025) for large homes and large commercial buildings
- Enable flexibility for owners in meeting limits
- Future requirements (2030/2040) to drive phased retrofit planning and normalize zero emissions choices at time of equipment replacement by 2025



## safety sustainability connection behaviour knowledge culture

## About Technical Safety BC

- TSBC issues permits for electrical installations in most of the province
- TSBC issues certifications for electrical field safety representatives and licences for electrical contractors
- TSBC supports development of safety standards for electrical equipment
- TSBC oversees training providers and delivers training and education related to codes & standards



## Low-carbon technology & energy efficiency research



**Research questions:** 

- Which low-carbon technologies used in building electrification can we enable through regulatory pathways or removing barriers?
- What is our role in oversight of energy efficiency for technical equipment?
- Now until March 2022



## The Integrated Resource Plan

Actions we need to take now to meet future electricity needs

- BC Hydro's 20-year plan to meet future customer electricity needs
- Province-wide plan for our integrated system
- Considers Provincial legislation and policy (e.g. Clean Energy Act and CleanBC)



Submitted to the BC Utilities Commission – end of 2021

#### Clean Power 2040 Powering the future





## **Electrification Plan**

**Existing & New Construction** 







## **Residential Rate Modernization**

55555 4444 333 110010157970 Jan 12, 2018 2 of 2

TOTAL DUE

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			Basic Charge 62 days @ \$0.18990 /day.
Electricity rates & energy use			ENERGY CHARGES Step 1: 1,376 KWh @ \$0.08580 KWh Step 2: 91 KWh @ \$0.12870 KWh
For electricity at your home, most customers are charged under the Desidential Conservation Da	te which		Rate rider 5%
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### 4 Expand Industry Capacity

Working with Partners



### 5 Increase Available Technologies

## Vancouver Economic Commission (VEC)





- **VEC –** Vancouver's economic development agency working to decarbonize the economy sine 2009
- Economics and Building Codes– VEC is tracking the economic impact of building codes \$3.3 billion alone for new construction covered by the Energy Step Code and Zero Emissions Building Plan in Metro Vancouver; billions more for retrofits, deconstruction, and low-embodied carbon.

5 Increase Available Technologies

## Vancouver Economic Commission (VEC) Heat Pump Technology Attraction Pilot

- BERM Action 5.3 Undertake an annual survey to identify and asses market readiness of high-potential technologies for electrification and use this to attract them to our regional market.
- **VEC 2021 Initiative** Heat Pump Attraction Strategy assessing heat pump technologies in other markets, and developing programs and initiatives to bring them to BC

5 Increase Available Technologies

## Vancouver Economic Commission (VEC) Green Buildings Initiative



- May VEC to launch RFP for consulting team
- **October –** Completion of availability surveying and barriers to market entry research
- **December** Attraction strategy developed
- **2022** Attraction activities, delegation visits, learning tours, certification collaborations



## Next Steps

### **The Road Map**







#### EFFECTIVE DECARBONIZATION STRATEGY

The Road Map workshops made it clear that there was an appetite to create a coalition to advance electrification as a very effective decarbonization strategy for both new construction and existing buildings ACTION PLAN (2021 – 2023)

This is reflected in the Road Map as a short-term action (2021 – 2023)

#### FOUNDATIONAL DOCUMENT

With the Road Map finalized, the Coalition has a foundational document that provides guidance on the Coalition's five priorities ZOX& the Building Electrification Coalition



## The Building Electrification Coalition will be hosted by ZEBx and launched later this year

There is significant alignment between ZEBx's mission to decarbonize the building industry/infrastructure and electrification – the most effective tool in the decarbonization toolbelt.

ZEBx will act as a **critical network hub** for building electrification which aims to overcome decentralization of capacity-building (resource development, coordination of training opportunities, etc.) and coordinate efforts so we can collectively increase our impact, reach and ability to exchange information.

### **Next Steps**

## 04

#### Case studies

## 02

01

Coalition Program Manager Website, branding and a communications plan (including a bimonthly newsletter) Leadership Council to not only help establish effective strategies to achieve its objectives and logical KPIs to monitor progress, but also assist the coalition in achieving its objectives.

03

#### FOR MORE INFORMATION Roberto Pecora, ZEBx Program Director roberto@zebx.org