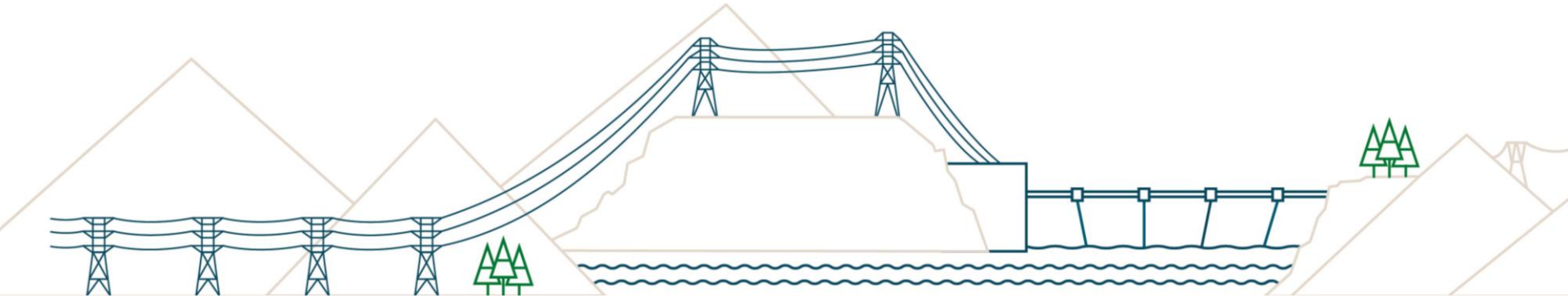


Electrification Plan Engagement

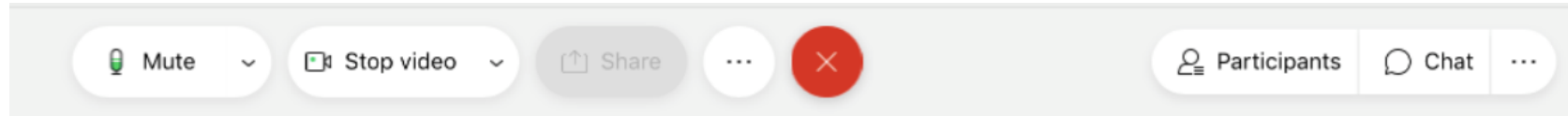


April 14, 2021

Cisco Webex reminders

We'll be using a few basic tools, which you can find if you hover your mouse over the bottom of the screen

Mute/unmute your mic
& turn your video on/off



View the
participant list



Audio connection trouble?
See the alternative options here



Open the chat panel:

- to ask questions
- to provide feedback

Virtual meeting etiquette



- Be respectful by listening to others and sharing time so that everyone gets heard
- Stay curious about new ideas
- Use the chat function to seek input and ask questions
- We are not recording these sessions, and kindly ask that others do not record

Introductions and Outline

- April 12 : Industry
- April 13: Transportation
- **Today: Homes and buildings (the built environment)**

- Each session will begin with an overview
- We've included breaks for questions and comments

Purpose

To provide an overview of our load growth strategy

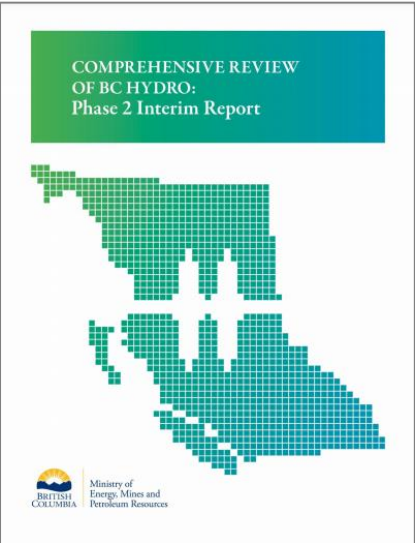
In these sessions we'll cover existing and new potential electrification initiatives in:

- Industry
- Transportation
- Homes and buildings (the built environment)

We're seeking your feedback on:

- opportunities for load growth
- barriers to electrification
- potential new BC Hydro actions to grow our load

Policy and Regulatory Context

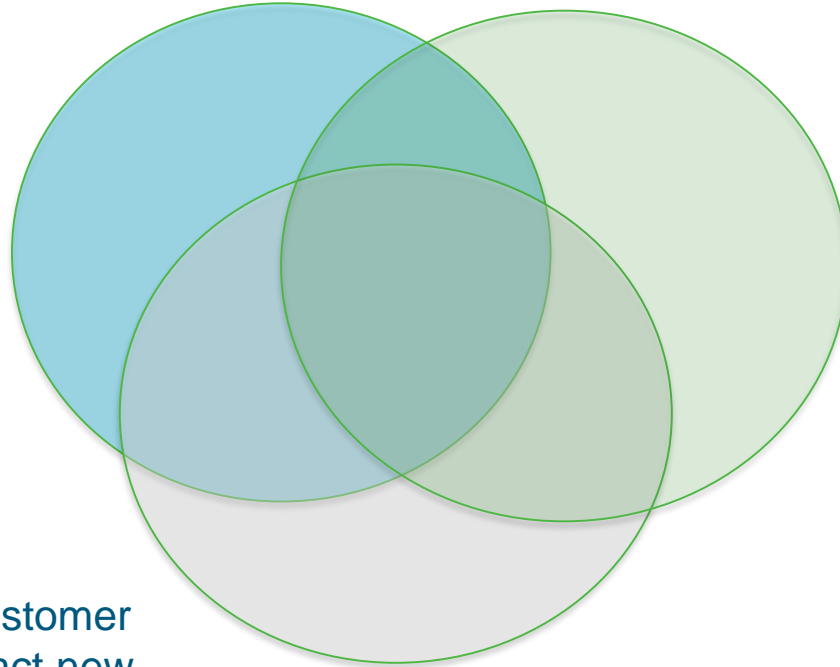


We're developing a plan to grow our load

To keep rates affordable

To reduce emissions and meet provincial GHG targets

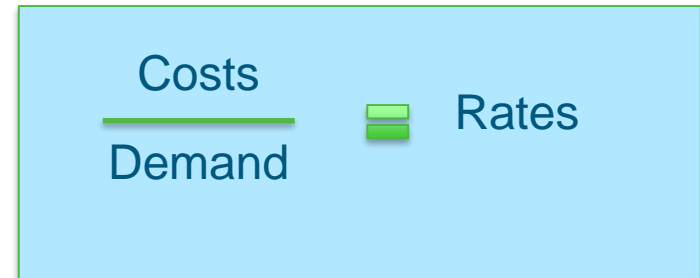
To support customer growth & attract new industries to BC



Load growth can improve affordability

- Maintaining and growing our load is a critical part of how we keep our rates affordable and competitive for customers.
- Many of our costs are fixed, which means they stay the same whether we sell more or less electricity.
- By growing our load and our revenues, we can reduce upward pressure on rates and improve affordability.

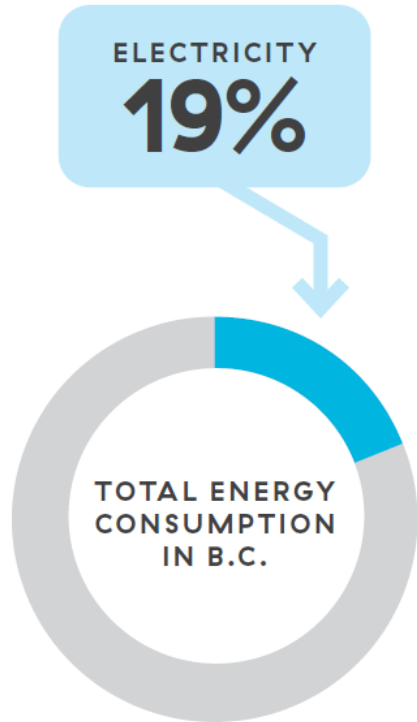
The Affordability Equation



The diagram illustrates the Affordability Equation as a light blue rectangular box with a green border. Inside the box, the word "Costs" is positioned above a horizontal green line. Below this line, the word "Demand" is written. To the right of the line, there is a small green square icon. Further to the right, the word "Rates" is written.

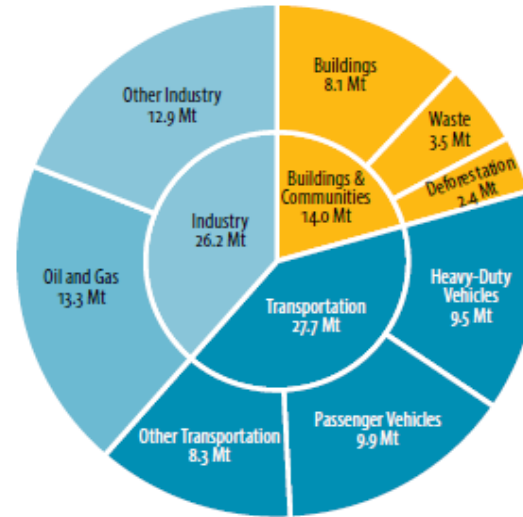
$$\frac{\text{Costs}}{\text{Demand}} = \text{Rates}$$

Load Growth Can Reduce Emissions

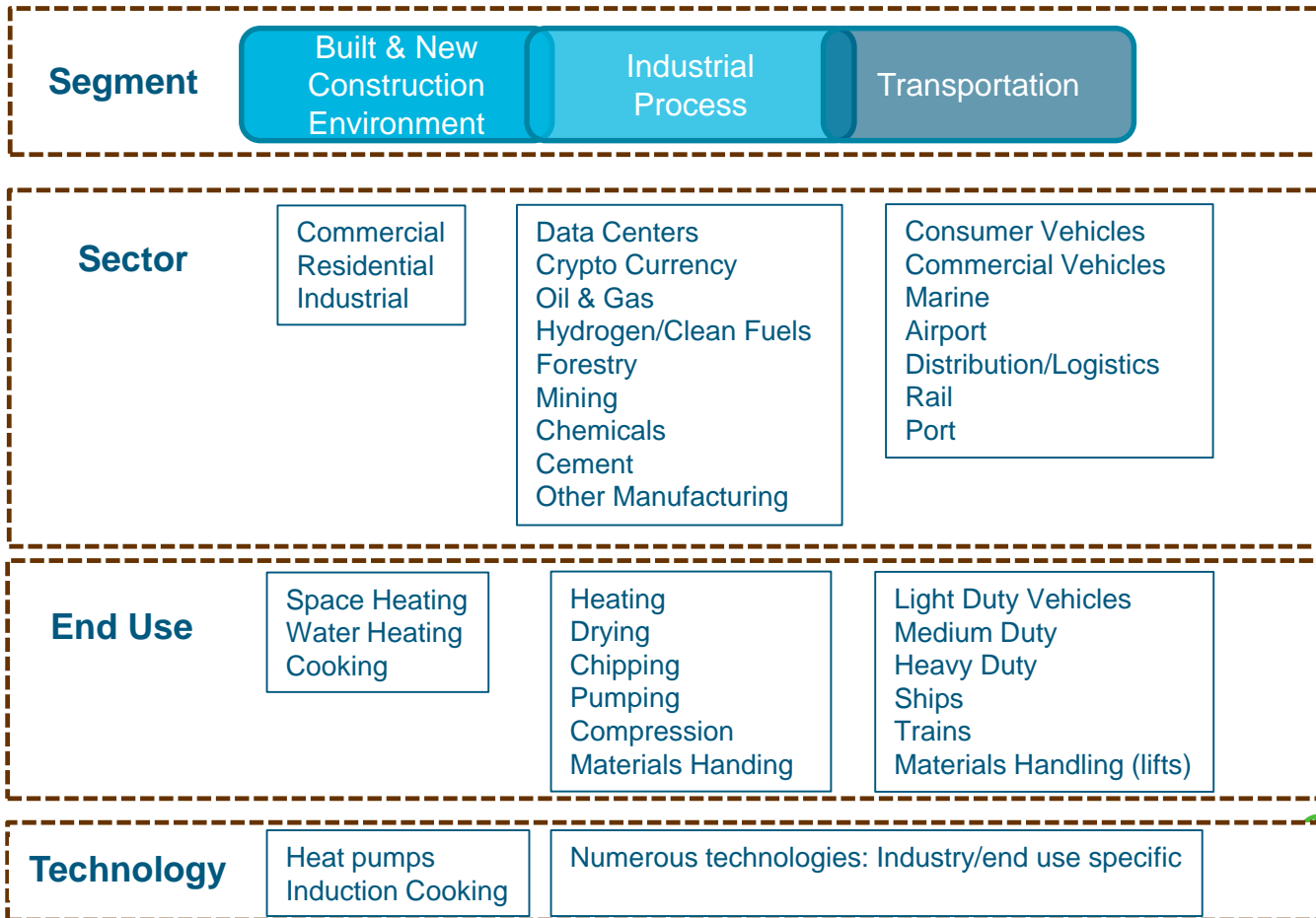


By switching from fossil fuels to clean electricity we could reduce emissions across BC

B.C.'s Gross Emissions by Sector in 2018



Emission reduction opportunities



Load growth

- BC's traditional resource-based industrial sectors will continue to play a leading role, but there is also significant interest from emerging energy-intensive sectors including clean technology, hydrogen, and data centers
- These emerging sectors can locate globally but are attracted by BC Hydro's clean, reliable, and affordable hydroelectric power

We're already taking action

BC Hydro has been supporting electrification by:

- Connecting customers and attracting new electricity consuming businesses
- Offering Low Carbon Electrification programs
- Introducing new rate designs
- Expanding the transmission system to enable gas producers to use grid electricity instead of self-supplying with natural gas
- Deploying EV charging stations

Governments are key partners



Better Homes
Better Buildings
Go Electric BC
CleanBC Industry Fund
CleanBC Industrial Incentive Program



Investing in Canada
Infrastructure Program:
Green Infrastructure Stream

Our approach is to build on these partnerships and address barriers and gaps

Working with government & other partners



The BC Building Electrification Road Map was created through the contributions and collaboration of multiple stakeholders across the British Columbia building industry. It serves as an important starting point in a dialog between stakeholders on how to achieve GHG reduction goals.

While many organizations contributed their time and expertise to the development of the Road Map, staff from the following organizations and institutions were fundamental to its creation:

Funding partners and Steering Committee members:



Additional Steering Committee members:



Lead consultant:



Supporting consultants:



BC's Building Electrification Road Map Report

Barriers to electrification

We're drawing on our DSM experience addressing barriers to energy efficiency

Barriers	Description
Awareness	Are customers aware of electrification opportunities and any relevant programs or incentives and do any myths or misconceptions need to be dispelled?
Acceptance	Do customers accept that low carbon electrification measures are attractive solutions that contribute to a better home, transportation alternatives, building or process and reduce GHG emissions?
Affordability	The costs of purchasing, installing and operating low carbon electrification measures can be more expensive than customers can justify or customers lack access to upfront capital to proceed with a project.
Availability	Are low carbon electrification technologies and professional services available in the customer's region?
Accessibility	Are the products or professional services available, but too difficult to find or access? Is BC Hydro's grid accessible? Is the time, cost and process to connect a challenge?

What will the plan cover?

- Initial five year strategy to grow existing and secure new load
- The plan will include:
 - New and expanded programs
 - New infrastructure investments
 - Rate design to support electrification
- The plan will include targets for load growth and emission reductions

When will the plan be complete?

The plan:

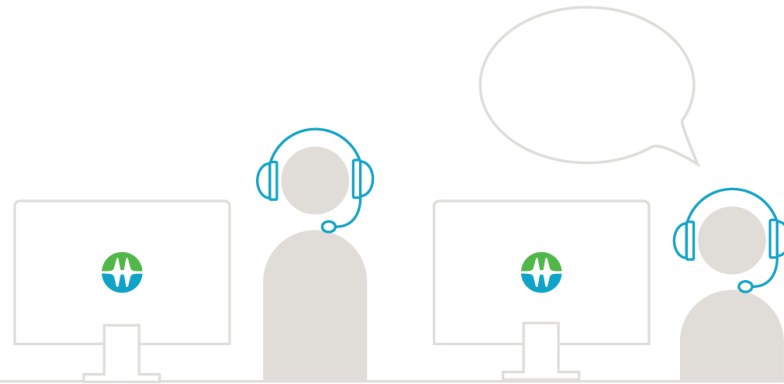
- will be completed this summer and included in BC Hydro's next Revenue Requirements Application
- will be an evolving framework

We'd like your feedback

We're seeking input on:

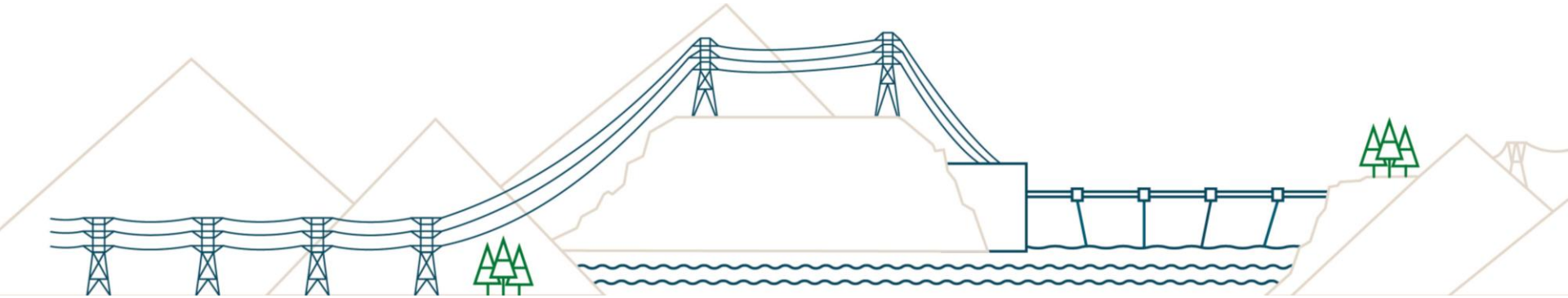
- opportunities for load growth
- barriers to electrification
- potential new BC Hydro actions to grow our load

Questions



Electrification Plan

Built and New Construction Environment



April 14 2021

Our Approach

Building on our experience with Demand Side Management (DSM), we:

- 1) Identify opportunities
- 2) Focus on key barriers to customer electrification
- 3) Identify gaps that remain after existing and planned actions
- 4) Develop and assess options for further BC Hydro actions

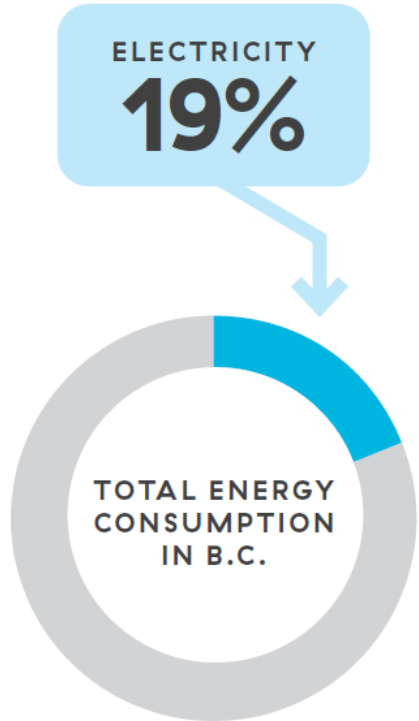
Topics

1. Opportunities
2. Barriers
3. Existing Actions
4. Potential Future Actions

Opportunities



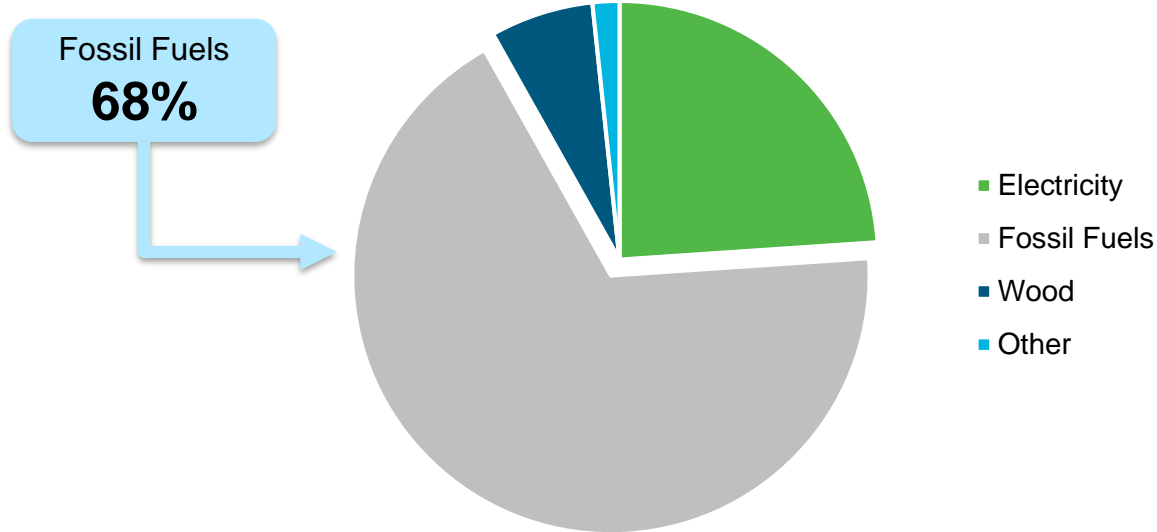
Where are the opportunities?



Built and New Construction Environment | Transportation | Industry

Where are the opportunities?

Total Energy Used for Space Heating and Domestic Hot Water



Residential, Commercial & Institutional Buildings

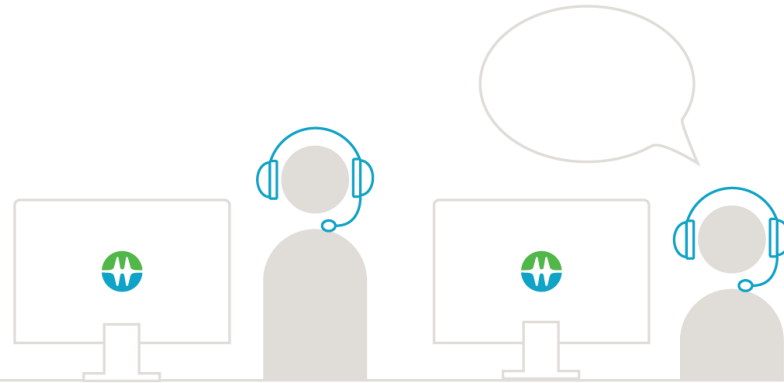
Existing & New Construction



End Uses

- Space Heating
- Ventilation
- Domestic Hot Water
- Cooking
- Building Envelope/Design/Site orientation (not strictly an end use but critical in building performance)

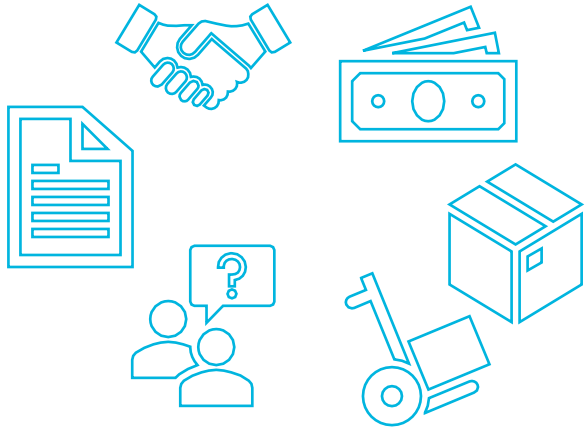
Questions



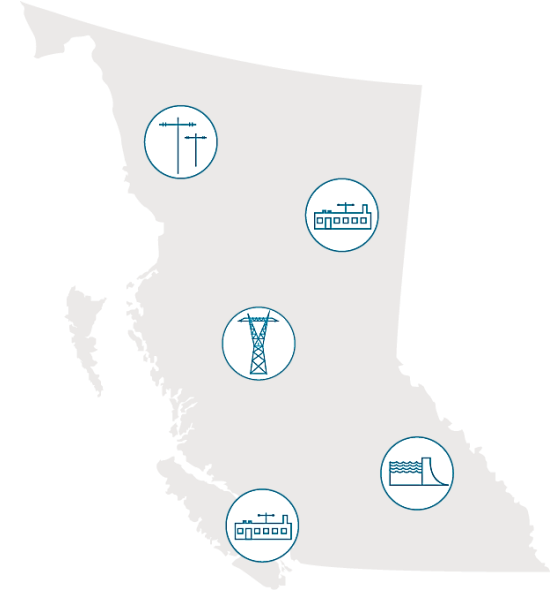
Barriers



Market Barriers



Utility Barriers



Commonly Consider the 5 A's

Barriers	Assessment
Awareness	Does the market know about the technology?
Acceptance	Does the market accept the technology as a viable option?
Affordability	Is the technology affordable compared to alternatives?.
Availability	Does the technology exist?
Accessibility	Does the market have access to the technology?

Barriers: Residential Air Source Heat Pumps

Barriers	Assessment
Awareness	Customer awareness of heat pump technologies is generally low relative to conventional space heating options.
Acceptance	While general awareness is low, once made aware of the technology there is little preventing customers from accepting the technology as a viable option as heat pumps are not a new technology and in wide use globally.
Affordability	There are cost barriers for residential customers considering switching from natural gas heating to heat pump technologies (includes both capital and operating costs).
Availability	A broad range of heat pump solutions are available in B.C.
Accessibility	Products and professional services (contractors to specify and install) are available for customers considering the installation of heat pumps. However, the contractor market is natural gas furnace dominant and contractors are likely to promote the simpler retrofit of “like for like” replacing an existing natural gas furnace with a new one rather than promoting fuel switching through the installation of a heat pump. Generally, customers in the lower mainland, Vancouver Island and Okanagan will be able to access heat pump products if they seek them out – there are gaps in parts of the province with limited cold temperature heat pump options and contractor knowledge and experience with cold temp heat pumps.

What have our commercial customers told us?

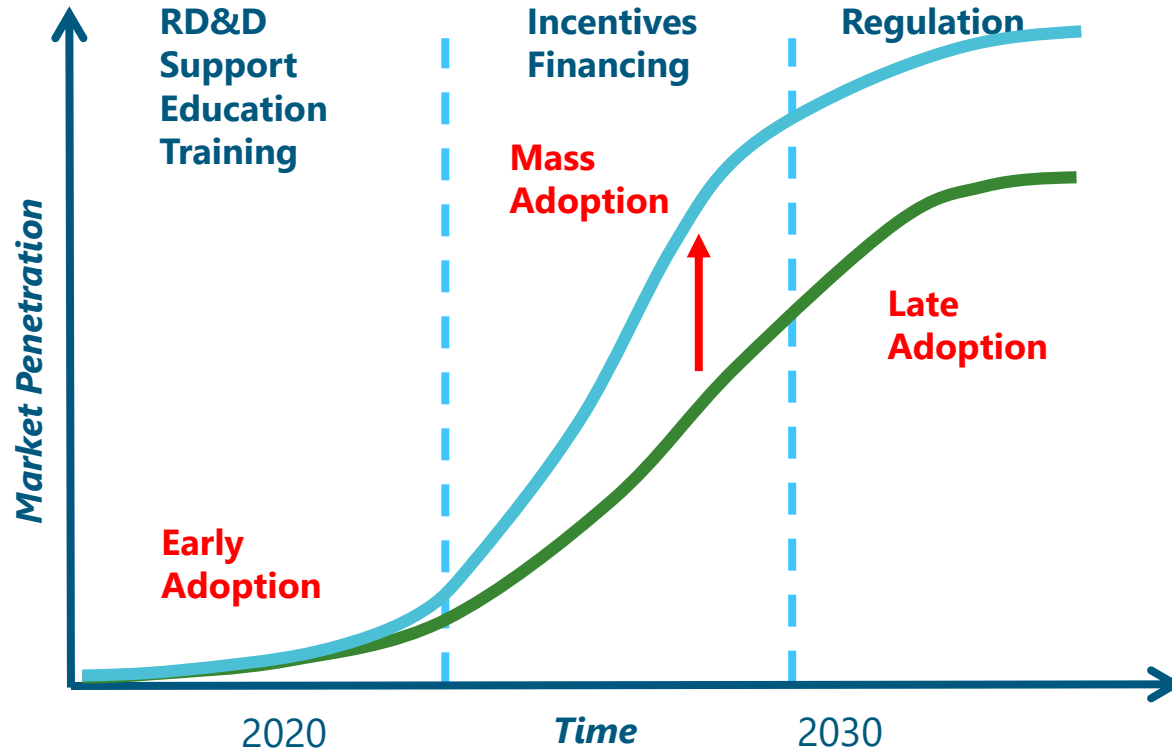
1. Upfront capital costs
2. Building's electrical capacity
3. Competing priorities
4. Project complexity
5. Electricity operating costs

Source: 32 Commercial Energy Managers

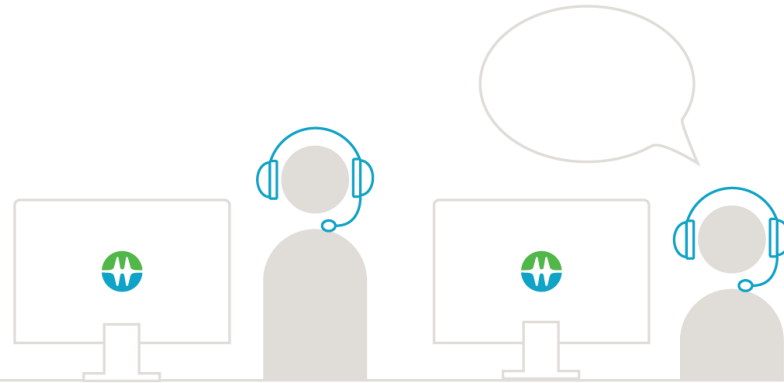
What did we hear through the work on the Building Electrification Roadmap?

- Action 1.4 – A broad public **awareness** campaign is needed that about the options and benefits of electrification.
- Action 2.2 – BC Hydro should review its **rate structure** to assess how it can be designed to encourage electrification.
- Action 2.3 – Utilities should **work with standard-making organizations** to **advance metering devices** that can support an electrification rate.
- Action 2.6 – It is recommended that BC Hydro **review its fee structure for connections** and **electrification-ready upgrades**.
- Action 2.12 – Effort needs to be made by electric utilities and local governments to **improve their response time for providing services upgrades and permits**.

Generic Accelerated Market Transformation



Questions



Existing Actions



Built and New Construction Environment: Residential Buildings

Information	<ul style="list-style-type: none">• www.bchydro.com has helpful customer focused information on heat pumps and the home as a system.
Regulation	<ul style="list-style-type: none">• Partner with provincial and local governments to implement the BC Energy Step Code, including exploring low carbon pathway.• Working with City of Vancouver on carbon reduction policies and requirements• Working with local governments to remove barriers to low carbon building heating systems (e.g. permitting, setbacks etc.)
Programs	<ul style="list-style-type: none">• Home Renovation Rebate Program supports efficient home retrofits (insulation, high efficiency windows, heat pumps, heat pump water heaters) – the efficiency of home construction supports heat pump performance.• Program Registered Contractor a network of qualified insulation installers, heat pump installers.

Technology information

The screenshot shows the BC Hydro website interface. At the top, there is a dark blue navigation bar with links for 'About us', 'Careers', 'Newsletters', and 'Contact us'. Below this is the BC Hydro logo and the tagline 'Power smart'. A search bar contains the text 'How can we help?' and there are 'Sign Up' and 'Log in' buttons. A secondary navigation bar includes links for 'Accounts', 'Energy savings', 'News', 'Projects & operations', 'Community', 'Work with us', and 'Outages & safety'. A breadcrumb trail reads 'Residential > Business > Electric vehicles in B.C.'. The main content area features the title 'Considering a heat pump? Info and tips' and a diagram of a house with arrows indicating 'cool air' being drawn out and 'warm air' being drawn in. Below the diagram, there is introductory text about heat pumps and a call to action to see maintenance tips.

Home > Energy savings > Residential > Building & renovating > Considering a heat pump? Info and tips

Considering a heat pump? Info and tips

Heating our homes accounts for the most energy use on our utility bills and more people are looking for cooling options than ever before. Heat pumps can be very efficient at heating and cooling.

Before you make the choice to install a heat pump, take a look at this information to help determine if it's the best choice for your home.

- What's a heat pump? ▾
- Types of heat pumps ▾
- Reasons to consider a heat pump and what you need to know ▾
- Find the best option based on your current heating system ▾
- Find the best option based on your needs ▾
- Recently purchased a new heat pump? ▾
- Get a \$2,000 heat pump rebate ▾

Recently purchased a heat pump?

See our heat pump maintenance tips.


Going beyond the building science

Buildings We Love

bchydro.com/powersmart/residential/buildings-we-love.html


The difference better built homes & buildings can make

We're visiting homes and other buildings across B.C. that nicely combine aesthetics, energy efficiency and comfort.





How Island Health successfully navigated The Summit

"We know that a big part of wellness is that sense of feeling connected to others. The Summit will provide a true sense of community for everyone who lives and works here."



TRU's world-beating approach to sustainable education

TRU was named as the highest-rated university in the world by the global Sustainability Tracking, Assessment and Rating System, achieving their prestigious Platinum rating.



These twins are special

Electric baseboard heaters are enough to heat super-efficient 1,350-square-foot twin homes in New Westminster.

Better Homes

Have questions? Using a screen reader or other assistive technologies? Call an Energy Coach at [1-844-881-9790](tel:1-844-881-9790)

cleanBC
BETTER HOMES

[Rebate Search Tool](#) [About Us](#) [Contact Us](#) [Menu](#)

Better Homes helps British Columbians find rebates that save energy and lower greenhouse gas emissions.

Find rebates for **renovating** a home

Find rebates for **building** a home

Not sure where to start? Follow our step-by-step guide

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Find incentives for commercial projects at BetterBuildingsBC.ca [Terms of Use](#)

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Financé en partie par:

Canada

BC Hydro
Power smart

FORTIS BC
Energy at work

Built and New Construction Environment: Commercial Buildings

Information	<ul style="list-style-type: none">• Key Account Management alongside Conservation & Energy Management Engineering and program managers work with commercial customers providing decision support, guidance to access available CleanBC programs as well as interconnection support.
Regulation	<ul style="list-style-type: none">• Partner with provincial and local governments to implement BC Energy Step Code, including exploring low carbon pathway.• Working with City of Vancouver on carbon reduction policies and requirements• Working with local governments to remove barriers to low carbon building heating systems (e.g. permitting, setbacks, district energy etc.)

Better Buildings

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cleanBC
BETTER BUILDINGS

[Incentive Search Tool](#) [About Us](#) [Contact Us](#) [Menu](#)

Find incentives for **renovating commercial buildings**

Find incentives for **new commercial buildings**

[Not sure where to start? Follow our step-by-step guide](#)

Funded in part by:
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Canada **BC Hydro** **FORTIS BC**
Power smart Energy at work

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Built and New Construction Environment: Commercial Buildings cont.

Programs

CleanBC | Better Buildings

1. **Custom Program** offers energy study funding and capital incentives for fuel switching and other electrification measures
2. **Custom-Lite Program** is a simplified version of the larger CleanBC Custom Program and is intended to facilitate smaller electrification opportunities across the commercial and institutional building sector.
3. **Commercial Express** is a prescriptive offer with a streamlined application process where building owners and operators receive incentives by simply answering a series of questions about their building. Applicants are not required to submit an Energy Study which is unlike any of the other retrofit offers.
4. **Small Building Energy Coach** energy coaching services to assist building owners and operators reduce GHGs through fuel-switching and other electrification measures and take advantage of CleanBC's Custom-Lite incentive offering.
5. **Commercial New Construction Program** provides funding for the design and construction of new high-performance buildings that use high-efficiency electricity in place of fossil fuels, in order to reduce greenhouse gas (GHG) emissions.

BC Hydro Low Carbon Electrification Program

Custom Program offers energy study funding and capital incentives for fuel switching electrification measures

District Energy

Effluent Heat Recovery at North Shore Wastewater Treatment Plant



<https://www.districtenergy.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=c4032ae3-1409-f4df-911b-174f170df2a&forceDialog=0>

Working with government & other partners



The BC Building Electrification Road Map was created through the contributions and collaboration of multiple stakeholders across the British Columbia building industry. It serves as an important starting point in a dialog between stakeholders on how to achieve GHG reduction goals.

While many organizations contributed their time and expertise to the development of the Road Map, staff from the following organizations and institutions were fundamental to its creation:

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Additional Steering Committee members:



Lead consultant:



Supporting consultants:



BC's Building Electrification Road Map Report

Working with Industry



HOME PERFORMANCE
STAKEHOLDER COUNCIL



BC HOUSING



Community Energy
Association



TECHNICAL
SAFETY BC



VANCOUVER
ECONOMIC
COMMISSION



ENGINEERS &
GEOSCIENTISTS
BRITISH COLUMBIA

zeb_x



BC Hydro
Power smart



HOME PERFORMANCE STAKEHOLDER COUNCIL

STEERING COMMITTEE

EXECUTIVE GROUP

SECTOR COUNCILS



RENOVATORS



HEATING & HVAC



INSULATION & AIR SEALING



FENESTRATION



ENERGY ADVISORS



UTILITIES & GOVERNMENT

COUNCIL PARTICIPANTS

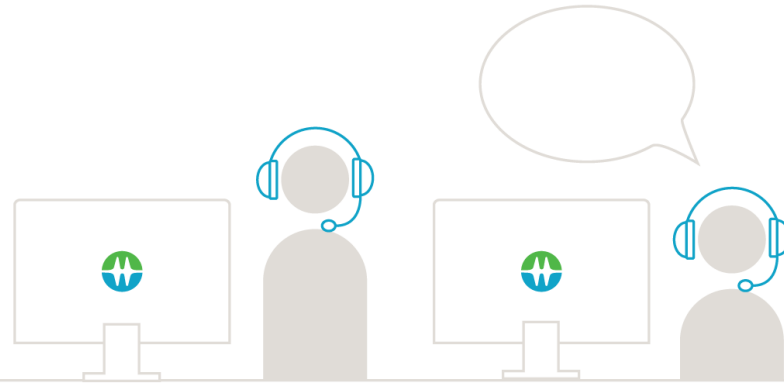
CONTRACTORS & SUB TRADES

TRADE SUPPLIERS

MANUFACTURERS & SUPPLIERS

SECTOR LEADERS

Questions



Potential Future Actions



New Programs



Expand the focus of Energy Manager Programs



Rates

The screenshot shows the BC Hydro website interface. At the top, there is a navigation bar with 'About us' and 'Ca'. Below this is the BC Hydro logo and the tagline 'Power smart'. A search bar contains the text 'How can we help?'. A secondary navigation bar includes links for 'Accounts', 'Energy savings', 'News', 'Projects & operations', 'Community', and 'Work with us'. A third navigation bar features dropdown menus for 'Login / Registration', 'Billing & payments', 'Moving', 'Electrical connections', and 'Electricity rates &'. The main content area shows a breadcrumb trail: 'Home > Accounts > Electricity rates & energy use'. The page title is 'Electricity rates & energy use'. Under the heading 'Electricity rates', there is a paragraph explaining that residential customers are charged under the Residential Conservation Rate, which is a two-step rate to encourage conservation. Below this, the section 'Understand your electricity use' provides information on comparing electricity use to similar homes, setting up email alerts, and getting an estimate of energy charges.

The screenshot shows a detailed electricity bill. At the top right, it lists the account number (55355 4444 333), invoice number (110010157870), billing date (Jan 12, 2018), and page number (2 of 2). The main heading is 'Bill details' for the period 'Nov 10, 2017 to Jan 10, 2018'. The 'PREVIOUS BILLING PERIOD' section shows a previous bill of \$90.08 and a payment received of -\$99.08. The 'BALANCE FORWARD' is \$0.00. The 'ELECTRICITY CHARGES' section is based on Residential Conservation Rate 1101 for 1,467 kWh used. It includes a 'Basic Charge' of \$11.77, 'ENERGY CHARGES' of \$118.05 (split into two steps), a 'Rate rider 6%' of \$7.08, and a 'Regional transit levy' of \$3.87. 'TAXES ON ELECTRICITY CHARGES' include GST of \$7.62. The 'ELECTRICITY CHARGES SUBTOTAL' is \$160.11, and the 'TOTAL DUE' is \$160.11.

Account number	Invoice number	Billing date	Page
55355 4444 333	110010157870	Jan 12, 2018	2 of 2

Bill details

Nov 10, 2017 to Jan 10, 2018

PREVIOUS BILLING PERIOD

Previous bill	\$90.08
Payment received Dec 8, 2017	-\$99.08

BALANCE FORWARD **\$0.00**

ELECTRICITY CHARGES

Based on Residential Conservation Rate 1101
Nov 10, 2017 to Jan 10, 2018 (1,467 kWh used)

Basic Charge 62 days @ \$0.18950 /day.....\$11.77*

ENERGY CHARGES

Step 1: 1,376 kWh @ \$0.08580 /kWh.....	\$118.05*
Step 2: 91 kWh @ \$0.12670 /kWh.....	\$11.71*

Rate rider 6%.....\$7.08*

Regional transit levy: 62 days @ \$0.06240 /day.....\$3.87*

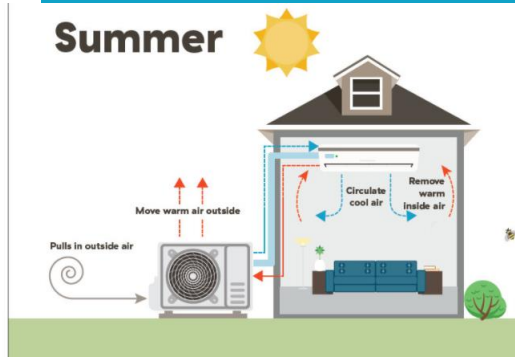
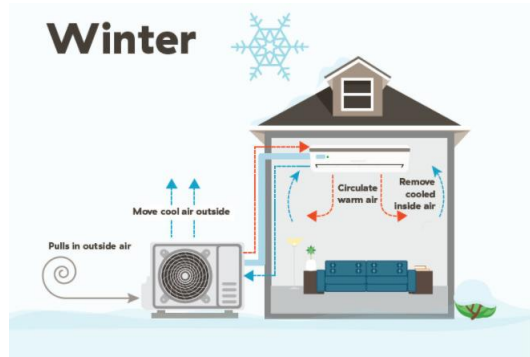
TAXES ON ELECTRICITY CHARGES

* GST 5% (GST Registration #RT121454151).....\$7.62

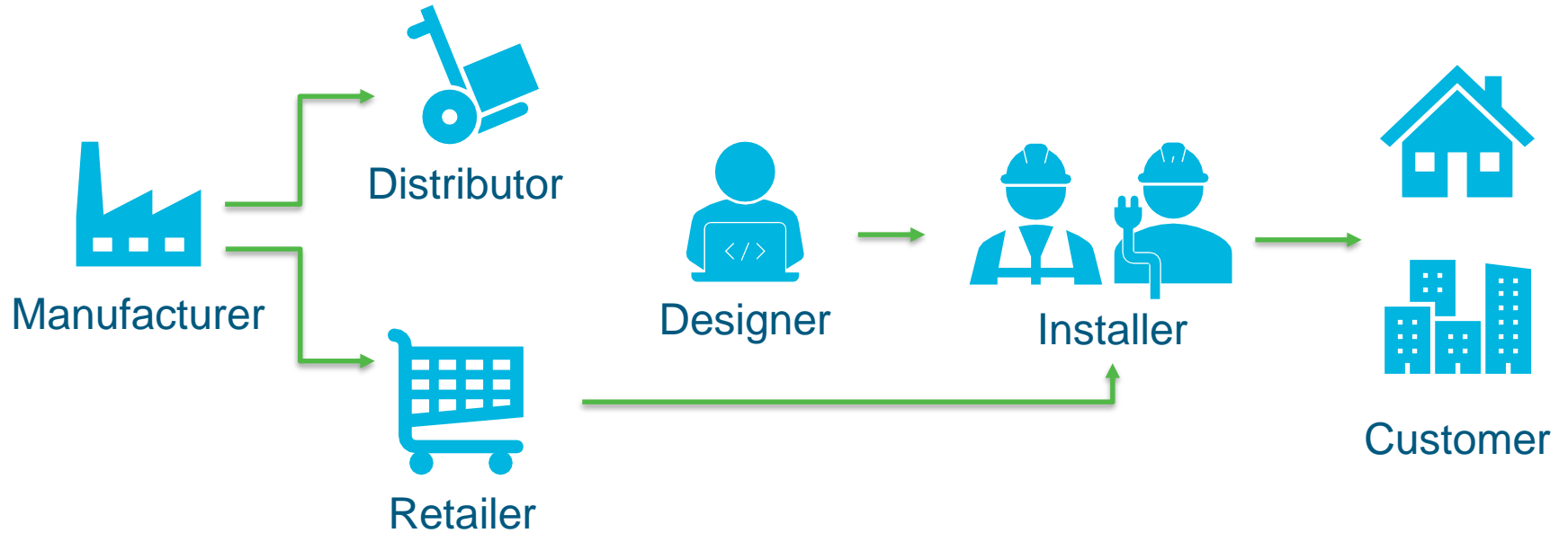
ELECTRICITY CHARGES SUBTOTAL **\$160.11**

TOTAL DUE **\$160.11**

Public Awareness



Supply Chain & Skills



Demonstration Projects

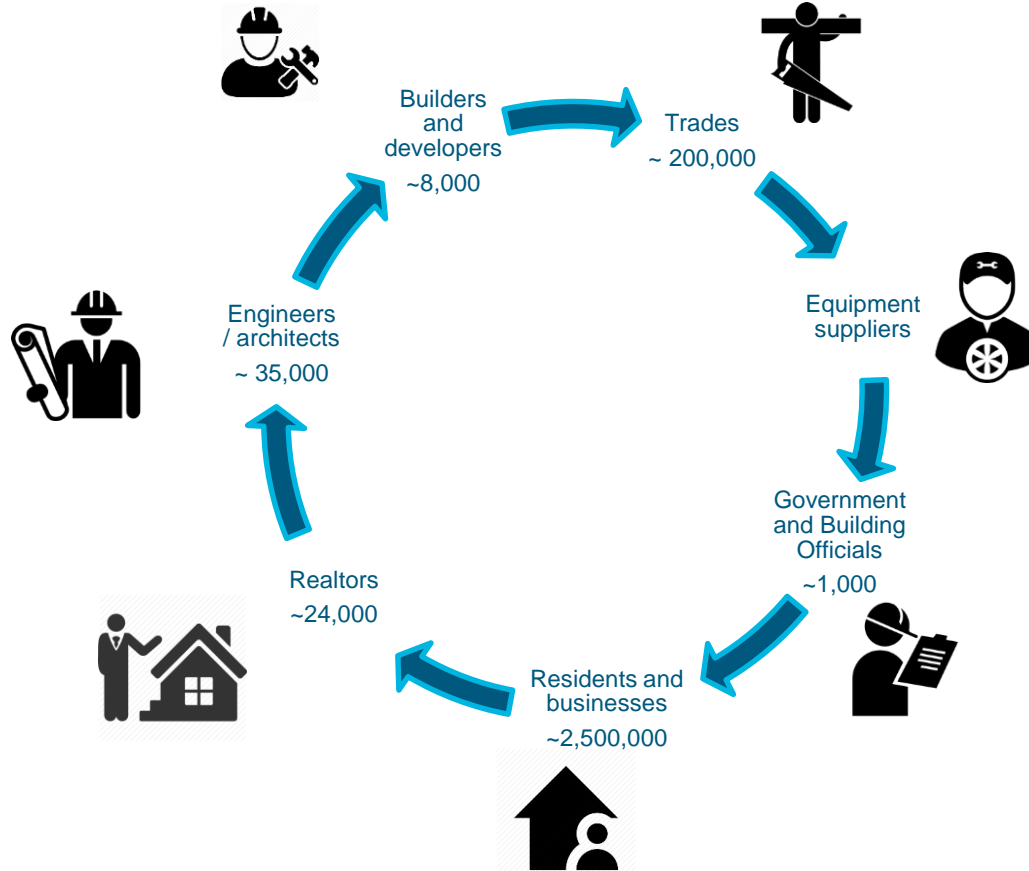


Codes and standards implementation

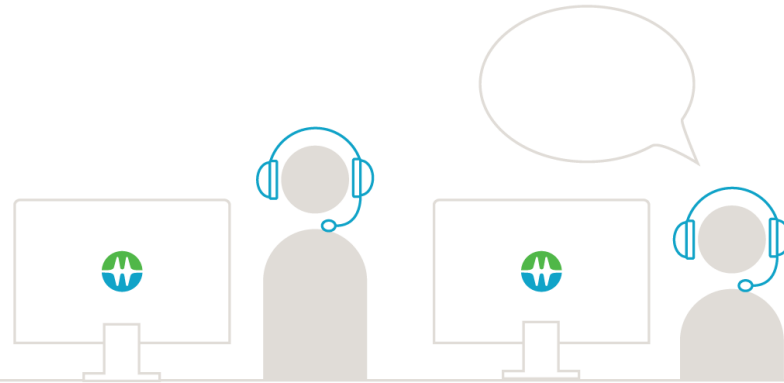


Implementing Building Electrification Roadmap

A Building Electrification Coalition



Questions





BC Hydro

Power smart