

cleanBC

# Building a cleaner, stronger BC

2019 Climate Change Accountability Report



# TABLE OF CONTENTS

<b>Message from the Minister</b>	iv
<b>Executive Summary</b>	1
<b>1 On the path to a cleaner B.C.</b>	4
<b>2 Reaching our targets</b>	8
<b>3 Measuring our progress</b>	11
3.1 Transparency and accountability	11
3.2 Emissions performance—most recent data	13
3.3 Sector-specific indicators—what else we’re measuring	15
3.3.1 <i>Transportation</i>	15
3.3.2 <i>Industry</i>	17
3.3.3 <i>Buildings and communities</i>	18
3.4 Carbon tax revenue and overall climate-related spending	20
<b>4 What we’ve accomplished</b>	21
4.1 Getting around	21
4.1.1 <i>More electric vehicles (EVs) on the way</i>	21
4.1.2 <i>Speeding up the switch to cleaner fuels</i>	26
4.1.3 <i>Less time in gridlock</i>	27
4.2 Improving where we live and work	30
4.2.1 <i>Better buildings—making future buildings more energy efficient</i>	31
4.2.2 <i>Supporting better buildings now</i>	35
4.2.3 <i>Supporting communities</i>	37
4.2.4 <i>Public sector leadership</i>	39
4.3 Reducing waste and turning it into a resource	42
4.4 Cleaner industry	44
4.4.1 <i>Low-carbon industrial strategy</i>	44
4.4.2 <i>CleanBC Program for Industry</i>	46
4.4.3 <i>Making industrial transportation cleaner</i>	47
4.4.4 <i>Making B.C. industries the cleanest in the world</i>	48
4.4.5 <i>Technological innovation, including carbon capture, utilization and storage</i>	50
4.4.6 <i>Forest carbon management</i>	52
4.4.7 <i>Hydrogen economy</i>	52

<b>5</b>	<b>Helping people get the skills they need</b>	<b>54</b>
<b>6</b>	<b>Preparing for a changing climate</b>	<b>56</b>
6.1	Strategic climate risk assessment	57
6.2	Climate preparedness and adaptation strategy	58
<b>7</b>	<b>Working together</b>	<b>61</b>
7.1	Partnering with Indigenous peoples	61
7.1.1	<i>Engaging with Indigenous peoples</i>	61
7.1.2	<i>Supporting Indigenous climate leadership</i>	62
7.2	Partnering with business and industry	64
7.2.1	<i>Small business</i>	64
7.2.2	<i>Industry</i>	64
7.3	Partnering with local governments	65
7.4	Engaging with youth	65
7.5	Engaging with British Columbians	66
<b>Appendix A</b>		<b>67</b>
1.	List of indicators that are currently quantified	67
2.	CleanBC initiatives by sector	68
<b>Appendix B</b>		<b>70</b>
Final report from Climate Solutions and Clean Growth Advisory Council		70

## MESSAGE FROM THE MINISTER

---



It's been just over a year since the launch of CleanBC—our government's plan to build a cleaner, better future where everyone benefits.

From the very beginning, CleanBC has been a collaborative effort. Working together as citizens, communities, business, Indigenous peoples, industry, and all levels of government we are rising to the challenge of the climate crisis by reducing pollution and creating new opportunities.

CleanBC will make cleaner options more convenient, available, and affordable. That's why we're helping with the upfront costs that come with home energy retrofits and electric vehicles, so people can benefit from lower heating and gas bills over the long run.

Twenty years from now, every new light-duty car sold will be a zero-emission vehicle. Already, we've seen record numbers of electric vehicles on the road, thanks to CleanBC rebates, more consumer options, and expanded charging stations across the province. With CleanBC efficiency rebates, we are helping to make homes and workplaces more efficient and more comfortable. And we are working with industry to help make businesses in B.C. the cleanest in the world.

Along the way, we have made it a priority to listen to people across the province as we are developing new policies and programs. Public engagement on our plastics action plan was one of the most popular undertaken by government. We heard from thousands of people during our CleanBC telephone townhalls, on proposed plans for boosting active transportation, making sure we have the skills we need for a low-carbon economy, and how we can best respond to changing weather and other climate impacts.

The Province's work to fight climate change has benefited from the advice of members of the Climate Solutions and Clean Growth Advisory Council, who have now completed their two-year term. Their dedication and hard work helped make a stronger, better CleanBC plan. In 2020, a new advisory committee will be established by law to help provide independent advice to government and will continue to strengthen our actions moving forward.

While we have launched a broad suite of new programs and actions to achieve our targeted results, we have also heard from many people – particularly from young people – that we need to hold ourselves accountable. We need to make sure our plan is working, and that means being honest and transparent about our progress.

And that's exactly what we're doing. In this first progress report, we have included summaries of our initiatives launched to date, and have identified areas of work still ahead. Building on over a decade of climate action in B.C., we provide technical detail on how we measure emissions reductions and how we intend to improve our ability to track and report our progress in the future. And we've made it law for all future governments to report annually on their progress to the legislature, so they are accountable for the results.

Governments around the world are grappling with the important question of how we can work together to take on the biggest challenge of our time. In British Columbia we are demonstrating that we can build a strong, sustainable economy and protect our clean air, land, and water. We can create opportunities for people to support themselves, their families, and their communities.

Our work to fight climate change is a shared priority with the B.C. Green Caucus, and we've worked in collaboration in the development of CleanBC and the passing of the *Climate Change Accountability Act*.

There is much more work ahead, but together with people across the province we've made a strong start. We will continue working to create opportunities for every community and to protect the places we love for future generations.

**Honourable George Heyman**

Minister of Environment and Climate Change Strategy



CleanBC has made British Columbia the leader in Canada on clean energy. We're putting record numbers of electric vehicles on the road, using energy more efficiently in our homes and buildings, and powering our industries with B.C.'s supply of clean, reliable and affordable hydro-electricity. What's more, by investing in clean technology and new innovations, our plan is working to boost the economy and create new opportunities in communities across the province.

**Honourable Bruce Ralston**

Minister of Energy, Mines and Petroleum Resources



With CleanBC we're building a more sustainable transportation system. We're expanding public transit and making it easier to get around without a car – and reducing pollution and gridlock while we do it. Transit fleets are becoming green so we can connect the places where we live, work, learn, and explore, in a healthy way.

**Honourable Claire Trevena**

Minister of Transportation and Infrastructure



Whether it's generating clean energy, building infrastructure more efficiently, or designing new technologies, making B.C. cleaner will create good jobs in communities across the province. We're making sure that everyone in B.C. has the skills and training they need to thrive as we reduce pollution and build a brighter future for generations to come.

**Honourable Melanie Mark**

Minister of Advanced Education, Skills and Training



We're building a blueprint for a low-carbon economy that creates opportunities across the Province. We are leaders in clean technology, developing new products and services in a global marketplace clamoring for solutions. With CleanBC we can continue to create good jobs, invest in our talented workforce, and keep this a great place to live and work.

**Honourable Michelle Mungall**

Minister of Jobs, Economic Development and Competitiveness



Through hard work and collaboration, the B.C. Green caucus and B.C. government have moved the dial on evidence-based climate and economic policies. To truly seize the opportunity CleanBC presents us as an economic framework, however, we need to fully embrace innovation across our economy, and ensure that communities throughout our province can prosper in a changing future.

**MLA Adam Olsen**

Saanich North and the Islands, Interim BC Green Party Leader



I was pleased to collaborate with Government on legislation that mandates annual reporting on climate action, adding credibility to the commitments in CleanBC. I welcome this first climate change accountability report which shows that we've accomplished a great deal together and that we have much more to do. I remain committed to the task.

**MLA Dr. Andrew Weaver**

Oak Bay-Gordon Head



## EXECUTIVE SUMMARY

---

**Our CleanBC plan set out a pathway to reduce emissions and make life better for people. In our first year, we've made significant progress and are continuing to develop new initiatives that build a brighter, stronger future for this province.**

CleanBC is an integral part of our economic plan. We are building a stronger, more sustainable economy that creates jobs and opportunities for all British Columbians. By focusing on some of the sectors that most affect our daily lives, our strategy shifts key sectors away from fossil fuels and towards cleaner energy.

Our work is well underway with a suite of incentives, programs, and legislation launched in the last year. And we have just begun.

### Early signs of success

We've seen a number of strong signals that the plan is working.

- In 2019, we saw a higher than expected adoption of electric vehicles, at almost nine per cent of new car sales, with an ever-expanding charging network. This moves us much more quickly than anticipated to achieving the legislated 2025 goal of 10 per cent light-duty vehicles sales. We will continue to closely monitor this trend in future years.
- We're renovating thousands of homes and businesses to be more energy efficient and supporting communities to develop clean energy and infrastructure. While we had lower uptake on building efficiency improvements in the first half of the year, we revised the approach to focus on outreach and making our offers simpler and easier to understand. We've seen early signs this is working. Our steps towards energy efficiency put us number one in Canada.
- With action from B.C. Transit, TransLink, and B.C. Ferries, we're transforming our fleets of buses and ferries. We've seen 14 new electric buses purchased or deployed in 2019, while B.C. Ferries has added two battery-hybrid vessels to its fleet and will be adding four more by 2022.
- Current data shows B.C. industries are among the cleanest in the world, and will continue to reduce carbon pollution with new benchmarks, regulations, and projects to lower their emissions.
- Province-wide over the last decade, we've slowed emissions growth while expanding our economy.

### Tracking our progress in the years ahead

Working with people, industry and businesses, Indigenous communities and businesses, and local and provincial governments, the full scope of actions envisioned in CleanBC will accomplish our 2030 emissions reduction goals. The initiatives announced in the last year set us 79 per cent of the way to our target, and we are developing further initiatives to close the gap.

With our most recent economy-wide data on emissions from 2017, it's still too early to see the broad impact of our policies. Our current modelling forecast suggests that emissions could increase over the next couple of years and then begin a downward trend as CleanBC policies take effect. With our latest analysis we've also received more accurate information about provincial emissions and the model suggests we are slightly closer to meeting our 2030 emissions reduction targets as a result.

To ensure we meet our commitments, we need to continually monitor the impacts of our activities and adjust our approach as needed. That's why we're establishing interim and sectoral emissions reduction targets with ground-breaking legislation passed last fall.

## Listening and learning from people across the province

We've reached out to tens of thousands of British Columbians as we've embarked on the important first steps of CleanBC. We've met with representatives from Indigenous communities to better understand the impacts of climate change and begin to identify how we can work together to respond. And we've worked with our partners at local and national levels of government as programs have rolled out—and will continue to do so as we develop next steps.

We held telephone townhalls across the province to speak with people directly and consulted with British Columbians as we rolled out key initiatives, including:

- To help get people out of their cars, we invited public feedback as we launched an active transportation strategy to support safer, more accessible commuting options.
- We received record amounts of feedback on the proposed Plastics Action Plan we released last summer.
- We've begun a dialogue on how communities can be best prepared for extreme weather and other climate impacts.
- We spoke to businesses, workers, community members, Indigenous communities, and educators about making sure people have the skills they need to thrive in a cleaner economy.

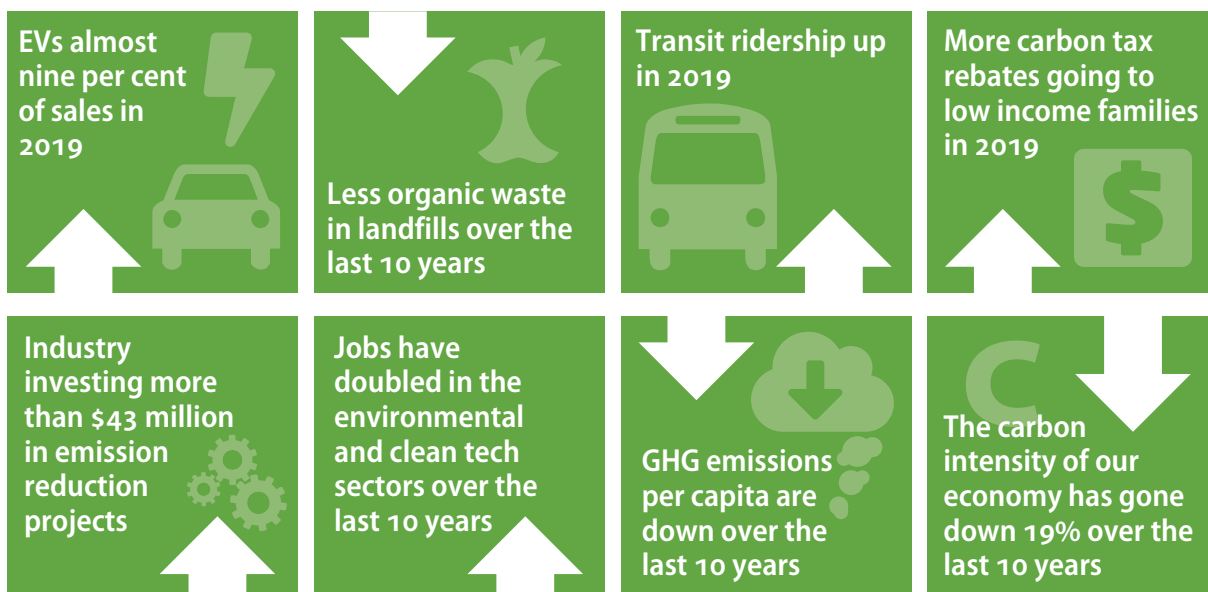
**Together we're growing the use of clean and renewable energy in how we get around, heat our homes, and fuel industry by providing low-carbon products, services, and energy solutions at home and to the world. We're demonstrating that cleaner is better, and our innovative people, businesses, communities, and industries are leading the way.**



### HIGHLIGHTS OF THE CLEANBC PLAN

- Reducing pollution from transportation with cleaner fuels, cleaner vehicles, and more support for measures to get people out of their cars
- Improving the buildings where we live and work by raising our standards for new construction and encouraging energy-saving improvements in existing homes and workplaces
- Reducing emissions from organic waste and diverting it from landfills
- Reducing emissions from industry with targeted incentives
- Working with employers, Indigenous communities, labour groups and others to make sure people throughout B.C. can get the skills they need for the jobs of the future

### What we've seen

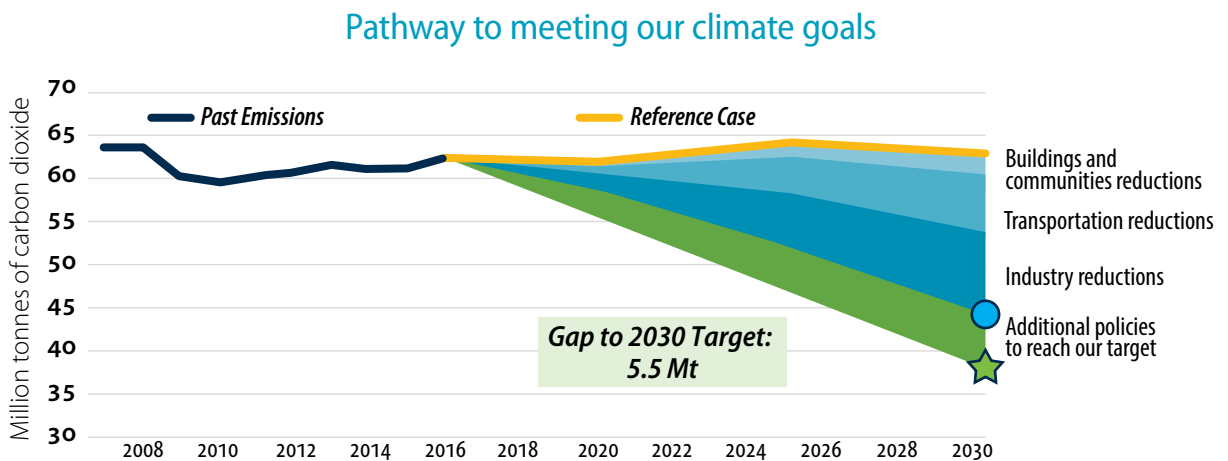


## 1 ON THE PATH TO A CLEANER B.C.

**The actions set out in CleanBC will reduce emissions across the economy over the next ten years and beyond. In the year since its launch, we have made significant headway with a number of key programs and initiatives and there is still more to do.**

The CleanBC actions laid out in December 2018 are set to reduce nearly 17 million tonnes (MT) of greenhouse gas emissions (GHG) by 2030, getting us 79 per cent of the way to our 2030 target. This puts us on a path to reduce emissions by 80 per cent by 2050, in line with Canada's commitment under the Paris Agreement.

We are achieving this through a slate of programs targeting the key sectors of industry, buildings, transportation, and waste. We are currently identifying additional initiatives to fully close the gap to our 2030 target.



### Meeting our goals

Meeting our targets requires a clear-eyed approach to the challenges and opportunities facing the province. Planning for future reductions must address the continued strong population and economic growth in B.C. and ensure affordability and accessibility to key services for people across the province.

The latest emissions data we have is for 2017, which means we have a two-year lag when it comes to measuring our progress. We are committed to remaining honest and accountable about how we're meeting our goals, which is why we've enacted legislation requiring annual reporting on progress and results on CleanBC commitments.

Our commitment is to continue adapting to make sure we achieve the goals we've laid out. Some programs may perform better than expected, and others will need fine tuning. We will be evaluating CleanBC's progress to our 2030 goals with interim and sectoral targets that set the path to success, and we will monitor improvements in emissions intensity and overall energy efficiency as important signals of success.

## Making cleaner options more affordable

The move to clean energy must be fair and affordable. Many of the initiatives outlined here focus on expanding accessibility to cleaner, more efficient options like point of sale rebates for electric vehicles and for home and business efficiency upgrades. We have also developed a low-cost financing option for residential efficiency upgrades that will be rolled out in 2020.

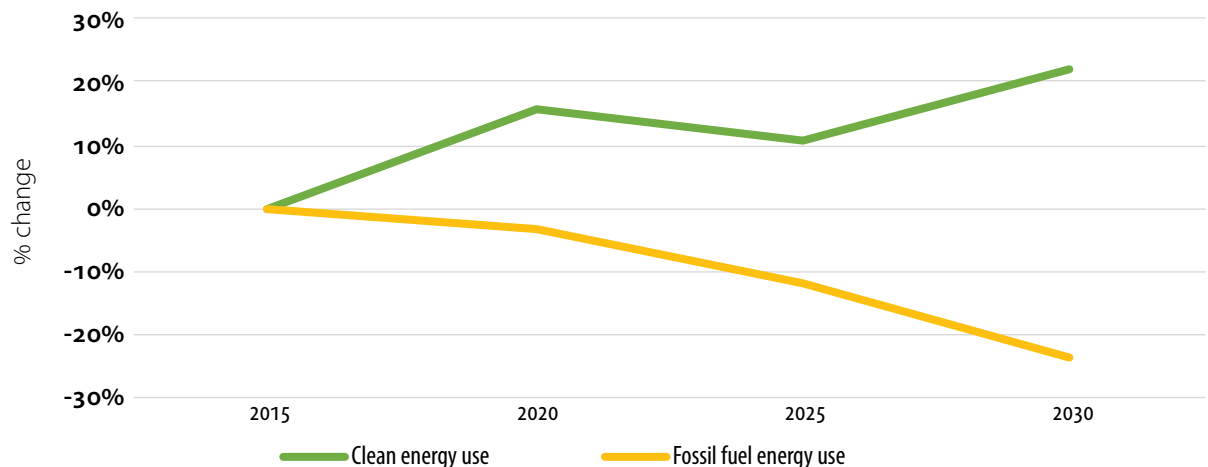
We're making cleaner options more affordable and accessible for all British Columbians:

- Helping with the upfront cost of buying a new electric vehicle through point-of-sale rebates.
- To help families and businesses save money on their heating and renovation costs, we're providing a range of rebates to help with efficiency upgrades.
- We're improving transit and road infrastructure to make active, cleaner transportation easier and safer.
- We're working with industry to reduce pollution and meet world-leading climate targets.
- And we're investing in improvements to industrial operations that reduce emissions and increase efficiency

## From fossil fuels to clean electricity

With electrification, we can make huge improvements in reducing emissions and making our province less polluting and more efficient. We are building on the legacy of our abundant supply of clean, renewable hydro-electricity, by switching more and more activity—like driving, heating our homes, and producing industrial goods—from fossil fuels to electricity.

### Changing how we use energy



## Reducing emissions in a global context

The global context for addressing climate change is constantly evolving. B.C. is a small jurisdiction but is making world-leading contributions, with CleanBC putting the province best in class in North America in many key areas.

As our actions expand, we will continue to ensure competitive conditions for business and industry across the province, including by encouraging cleaner operations through world-leading benchmarks, and support for emissions reduction projects. When it comes to clean technology, our innovative people and businesses consistently lead the way, providing goods and services to a global marketplace that is searching for cleaner solutions.

While other jurisdictions rely on more polluting sources of power, B.C. is already a step ahead. But with our clean energy advantage, remaining reductions beyond those already laid out in CleanBC will need to be more targeted and more transformative, overcoming existing technology barriers.

### B.C.'s Climate Action Compared to Other Jurisdictions

		British Columbia	Alberta	California	Ontario	Québec
<b>Carbon pricing system</b>	Carbon tax or cap and trade system	✓	✓	✓	✓	✓
<b>Clean electrical grid</b>	Greater than 90% from renewable sources	✓				✓
<b>ZEV standard</b>	Requires increased sales of zero-emission vehicles	✓		✓		✓
<b>Low carbon fuel standard</b>	Requires a decrease in the carbon intensity of fuels	✓		✓		
<b>Public sector leadership</b>	Requires all public sector organizations to reduce, report and offset emissions	✓				

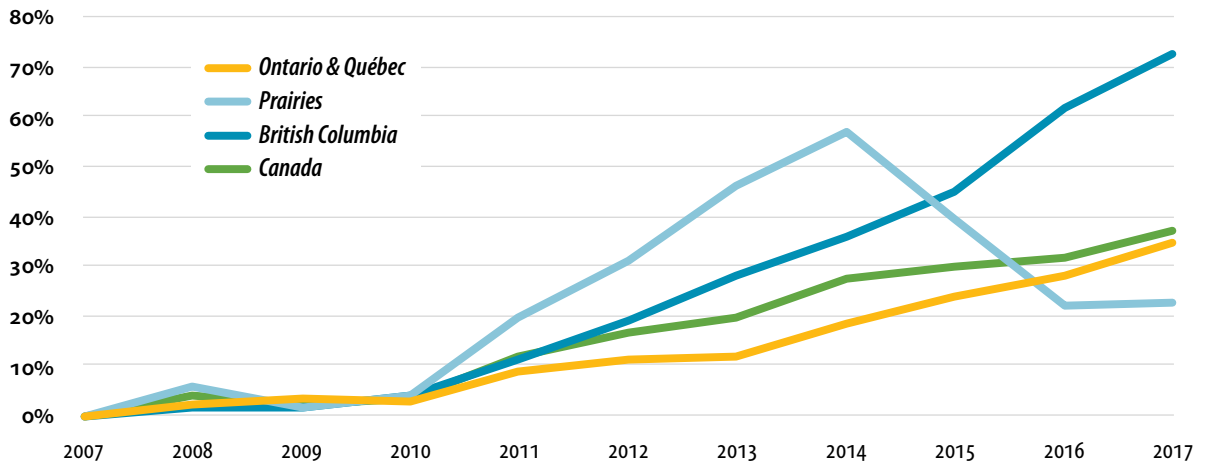
## New opportunities with innovation and clean technology

With CleanBC we're building a strong, sustainable economy. British Columbia has outpaced the Canadian average for growth for a fifth consecutive year, with the fourth-largest provincial economy in the country. Our economy is diverse, supported by a talented labour force that is in heavy demand.

Further reducing carbon pollution can build on these strengths, in particular in areas like high-tech and clean-tech that have already distinguished B.C. as a world leader.

We've seen continued growth in these sectors. British Columbia's clean technology sector has doubled in revenue growth since 2015, outpacing the national average and generating \$3.7 billion in revenue in 2017. Our clean technology sector will be instrumental to unlocking B.C.'s full potential as it transitions to the low-carbon economy envisioned in the CleanBC plan. As we use more and more clean energy, we will be building on the clean energy sector that contributed three per cent to B.C.'s GDP in 2017.

### High-Tech Revenue Growth in B.C.



Economic opportunities in the province are attracting people from all over the world. In 2017, B.C.'s environmental and clean-tech sector employed approximately 14,550 people, up from 7,160 in 2015, while the clean energy sector employed 32,000 people. British Columbia's talented workforce will be well-positioned to take advantage of the good-paying jobs created in all sectors of the low-carbon economy, including resource industries, research and development, the service economy, and in emerging and growing sectors.

### Working together

CleanBC calls on all of us, citizens, business and industry, labour, Indigenous communities, and local, federal and provincial governments to be part of making this province stronger, now and into the future. We will continue to work together, strengthening and building relationships with key partners, to protect what we care about and move towards a cleaner future.

## 2 REACHING OUR TARGETS

**British Columbia has set ambitious GHG reduction targets. Relative to emission levels in 2007, we're working towards reductions of 40 per cent by 2030, 60 per cent by 2040, and 80 per cent by 2050.**

The *Climate Change Accountability Act* was updated in 2019 to require the Province to annually:

- publish the most recent provincial GHG inventory
- estimate B.C.'s GHG emissions for that year
- estimate emissions for the following two years.

For this report, we're quantifying emissions from 2017 and estimating emissions from 2018 to 2021. We're also providing a status update on progress towards our legislated targets. These new targets reflect the fact that early progress to meet our commitments was slow, making the 2020 target out of reach.

### Updating our emission forecasts

CleanBC laid out a pathway to reduce our emissions by 18.9 Mt of CO<sub>2</sub>e, which is 75 per cent of our 2030 target, leaving a gap of 6.1 Mt to be reduced by further actions. These projections were informed by modelling<sup>1</sup> analysis conducted in the fall of 2018.

Since then, we've updated our modelling as part of a regular series of improvements to ensure that core assumptions remain aligned with real world developments. These include updating key data inputs (such as forecasted fuel prices and economic growth levels) as well as some policy details (namely aligning funding assumptions with those in *Budget 2019*). Updates to the model include:

- Improving representation of economic activity with the latest data from Statistics Canada
- Incorporating GHG emissions data from the 2017 Provincial Inventory
- Aligning with BC Hydro electricity consumption and cost of generation forecasts
- Incorporating B.C.'s updated official natural gas production forecast from the Ministry of Energy, Mines and Petroleum Resources
- Improving the accuracy of natural gas emissions intensity values based on the most recent data
- Including a more detailed representation of the transport sector, due to changes in emissions data provided by the federal government<sup>2</sup>.

The latest modelling results suggest that we are slightly closer to meeting our 2030 emissions reduction target. We will continue to refine our model to include better data as it becomes available, which could result in further changes.

<sup>1</sup> The Province assesses progress towards meeting its 2030 GHG reduction target by modelling CleanBC policies to estimate their impact on future emissions. B.C. uses the gTech model developed and administered by Navius Research for this analysis. Information on the model's structure and capabilities as well as the core assumptions and policy design included in the CleanBC modelling analysis is documented in [the methodology book available here](#).

<sup>2</sup> Additional information on these updates is available in [the methodology book](#).

## DETAILS ON UPDATED MODELLING

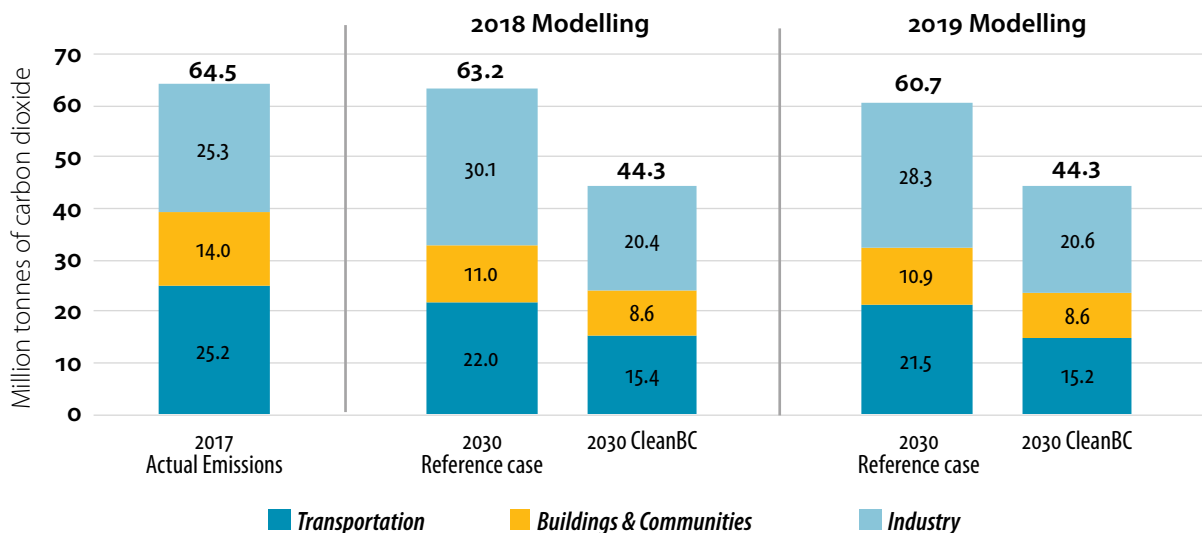
The updated modelling results in a slightly smaller gap of 5.5 Mt, which means we are 79 per cent of the way to meeting our 2030 target. The change is largely due to updates in the 2017 provincial GHG emissions inventory. The inventory undergoes methodology and data improvements on an annual basis. Specifically, 2007 emissions (on which our targets are based) were revised upwards (from 63.6 Mt to 64.8 Mt).

On a sector-by-sector basis, the updated modelling shows results similar to the previous year. The main difference occurs in the reference case in the industrial sector. Emissions in the natural gas sector are now projected to be lower, meaning that fewer reductions from CleanBC policies are required to achieve a similar 2030 emissions level.

For more information on B.C.'s modelling results, see [the methodology book](#).

## Comparison of 2018 vs 2019 GHG modelling

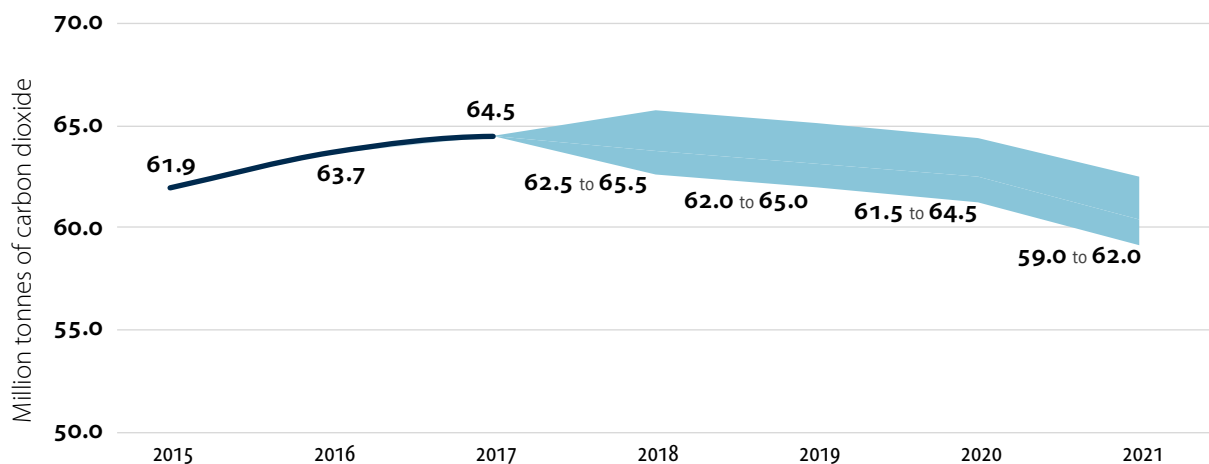
2030 emissions totals under CleanBC and reference case<sup>3</sup>



Consistent with our commitments under the *Climate Change Accountability Act*, we used the updated model to estimate GHG emissions over the next few years. Recognizing the inherent uncertainty in predicting the future, our analysis estimates a range of potential values based on different model inputs to understand how they could affect future emissions. These model inputs included oil and gas prices, economic growth and technological costs, among others.

<sup>3</sup> The reference case shows estimated 2030 emissions with no CleanBC action.

### Gross GHG Emissions Forecast from 2018 to 2021



The forecast suggests that GHG emissions could increase over the next couple of years and then begin a downward trend as CleanBC policies take effect. For 2018, we estimate that gross GHG emissions are likely to range between 62.5 and 65.5 Mt, decreasing to between 59.0 and 62.0 Mt by 2021.



## 3 MEASURING OUR PROGRESS

---

**As part of CleanBC, the Province has renewed its commitment to honest, accountable reporting on our progress on climate action. Because of the time involved in data collection, it's too soon to quantify the GHG impacts of CleanBC policies and programs. But we have developed a robust framework for measuring our progress and openly accounting to the people of British Columbia.**

Many of the initiatives in CleanBC are new. Some may perform better than expected and others will need fine tuning. We will evaluate progress towards our 2030 goals with interim and sectoral targets that set the path to success. And we will report on a wide range of indicators, including emissions intensity and energy efficiency, both of which are critical to decarbonizing our economy.

### 3.1 Transparency and accountability

To help keep CleanBC on track, the Province has developed a new accountability framework under the *Climate Change Accountability Act*.

The framework requires:

- detailed annual reporting to the legislature on actions taken to reduce emissions and manage risks from climate change
- an interim emissions target on the path to our 2030 goal
- emissions targets for different sectors.

Amendments to the Act also explicitly require that the Province establish an independent advisory committee to keep government accountable. The new committee will carry on the oversight role of the Climate Solutions and Clean Growth Advisory Council, which completed its mandate at the end of 2019.

The new advisory committee will have a similar role and make-up, representing a wide range of interests and expertise, including representatives from Indigenous communities, local governments, environmental organizations, academia, unions, rural and remote communities, and the business community. The new committee must also be made up of at least 50 per cent women members.

## FINAL REPORT OF THE 2017–2019 CLIMATE SOLUTIONS AND CLEAN GROWTH ADVISORY COUNCIL

The Climate Solutions and Clean Growth Advisory Council was established in 2017 with a two-year mandate to provide strategic advice to government on climate action and clean economic growth. It included members from First Nations, environmental organizations, industry, youth, academia, labour and local government.

In October 2019, the council delivered its [final report](#) to the Province, providing a list of recommendations on CleanBC implementation. Generally, the council recommended that the Province:

- maintain the momentum on implementing Phase 1 policies, while working aggressively to plan for and start implementation of Phase 2
- develop a clean energy strategy that clearly identifies how all of the commitments and policy actions will be achieved
- prioritize coordination across government ministries, the federal government and other stakeholders, to ensure CleanBC is implemented in a comprehensive manner
- continue to deepen its engagement with Indigenous and local governments to ensure CleanBC is implemented as effectively as possible, and that Indigenous and local governments are fully involved
- develop an action plan based on its 2019 Climate Risk Assessment to address climate adaptation
- actively engage with various sectors of the economy, including the innovation and technology sector, to understand impacts of CleanBC and seek feedback on additional solutions to achieve the remaining reduction in emissions, and consider the advice in developing policy alternatives
- identify specific actions to support industrial competitiveness through the transition to a low-carbon economy
- develop a comprehensive engagement strategy with youth and young adults to ensure their perspectives and voices form part of all climate action plans and policies
- look for opportunities that bring together mitigation and preparedness in ways that are synergistic
- be a proactive voice, with the government of Canada, to ensure that any Internationally Transferred Mitigation Outcomes (ITMOs) have a high degree of credibility and transparency. Irrespective of future decisions regarding the use of ITMOs, the B.C. government should also continue to identify and implement opportunities to close the gap to its 2030 targets

The Province is taking action across these areas, as evidenced throughout this first-year report. We look forward to engaging with, and hearing recommendations from, the new advisory committee in 2020. The final report can be viewed in its entirety in Appendix B.

## 3.2 Emissions performance—most recent data

2017 emissions total: 63.5 Mt of CO<sub>2</sub>e  
Net Emissions change from 2007: -2.0 per cent

### Provincial overview

B.C.'s annual GHG emissions are based on a national inventory from Environment and Climate Change Canada (ECCC). Because it takes time for ECCC to collect and verify data from across a wide range of sources, there's a two-year lag in reporting out results. So our most recent data on B.C. emissions tell the story of 2017 which saw an increase in gross emissions of 1.2% from 2016.

That year, our gross GHG emissions were 64.5 Mt of carbon dioxide equivalent (CO<sub>2</sub>e). When including 1.0 Mt CO<sub>2</sub>e in offsets from forest management projects, our net<sup>4</sup> GHG emissions were 63.5 Mt CO<sub>2</sub>e.<sup>5</sup> Because we do not allocate the offsets across different emissions sectors, just to the provincial total, we will refer to gross GHG emissions for the remainder of this section.

### Economic transition

Understanding overall emissions is important but we also need to consider emissions in the context of a growing population and economy. As CleanBC policies are implemented and continue to transform our province, we need to continue to de-couple emissions from growth.

Indicators in this area measure how well B.C. is doing as we make the transition to a cleaner economy with fewer GHG emissions.

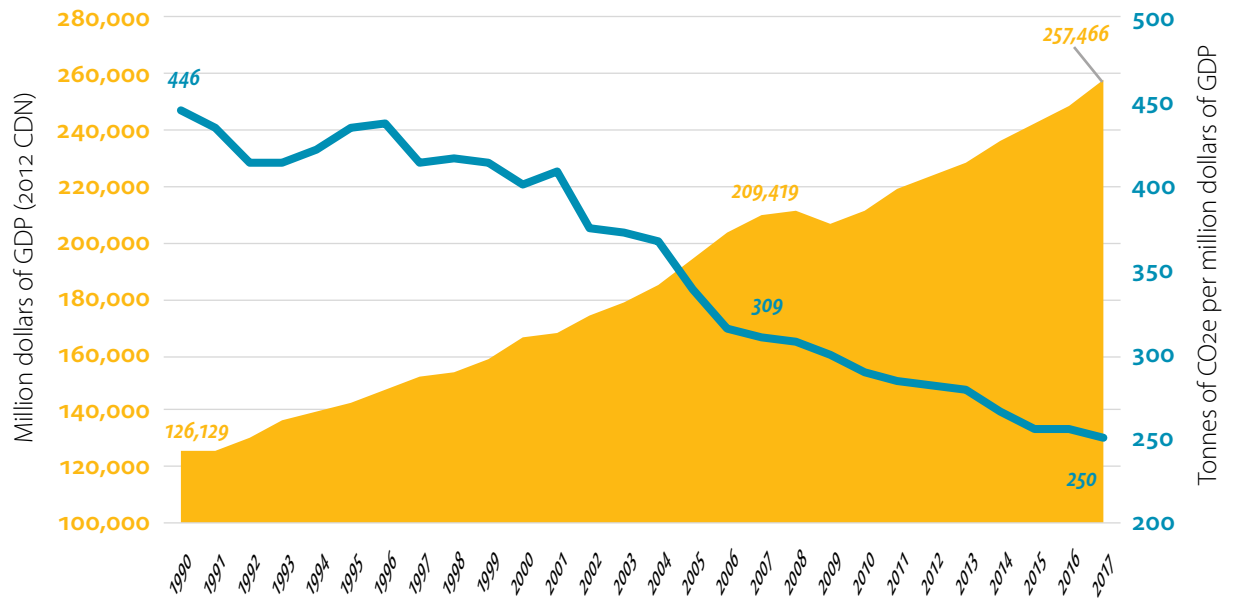
Between 2007 and 2017, the economy grew by 23 per cent while gross GHG emissions fell by 0.5 per cent. That means that the GHG intensity of our economy decreased by 19 per cent since 2007.

GHG emissions per person have also fallen. Between 2007 and 2017, they decreased 13 per cent from 15 tonnes of CO<sub>2</sub>e to 13 tonnes.

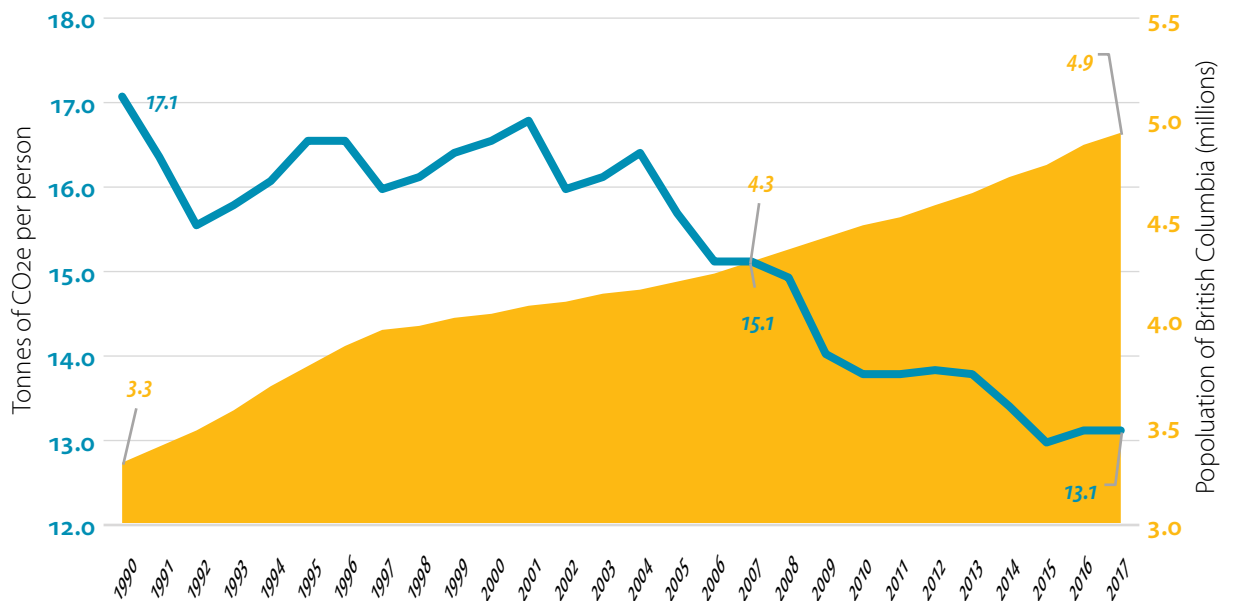
4 Net emissions are gross GHG emissions (as reported in the BC Provincial Inventory) less the offsets from forest management projects.

5 While land-use, land-use change and forestry emissions are reported on in a separate section of the Provincial Inventory, these emissions are not included in B.C.'s GHG reduction targets or in the emission totals discussed in this section because: (1) Environment and Climate Change Canada does not include these emissions in national totals; (2) emissions from these categories are both large and volatile due to natural causes largely outside of human control (such as wildfire and pests).

### Carbon Intensity of the Economy



### Carbon Emissions and Population Growth



### 3.3 Sector-specific indicators—what else we’re measuring

Along with GHG emissions, we’re tracking the progress of CleanBC with indicators for each key sector, and for the economy overall<sup>6</sup>.

As we move forward with various initiatives, we will develop additional indicators to better reflect the impacts of our work. These will focus on areas such as affordability, rural development, the clean economy and clean jobs, reconciliation and gender equality.

Overall, results to date suggest positive trends toward reducing GHG emissions, underlining the importance of CleanBC in meeting our 2030 targets.

#### 3.3.1 Transportation

2017 emissions total: 25.2 Mt of CO<sub>2</sub>e (39 per cent of total)  
Emissions change from 2007: +5 per cent

Transportation indicators measure changes in B.C.’s transportation sector including personal vehicles, transit, and fuel.

Although emissions have increased since 2007, several indicators suggest the transportation sector is now trending in the right direction. For example, sales of new light-duty electric vehicles grew from fewer than 100 vehicles in 2011 to over 17,000 in 2019. In 2019, nearly nine per cent of all light-duty vehicles sold in B.C. were electric vehicles. That means we’re close to hitting our goal of 10 per cent by 2025 and on the right path to meeting our target of 30 per cent by 2030 and 100 per cent by 2040. The increase in electric vehicles is consistent with an increase in the number of electric vehicle rebates provided by the Province.

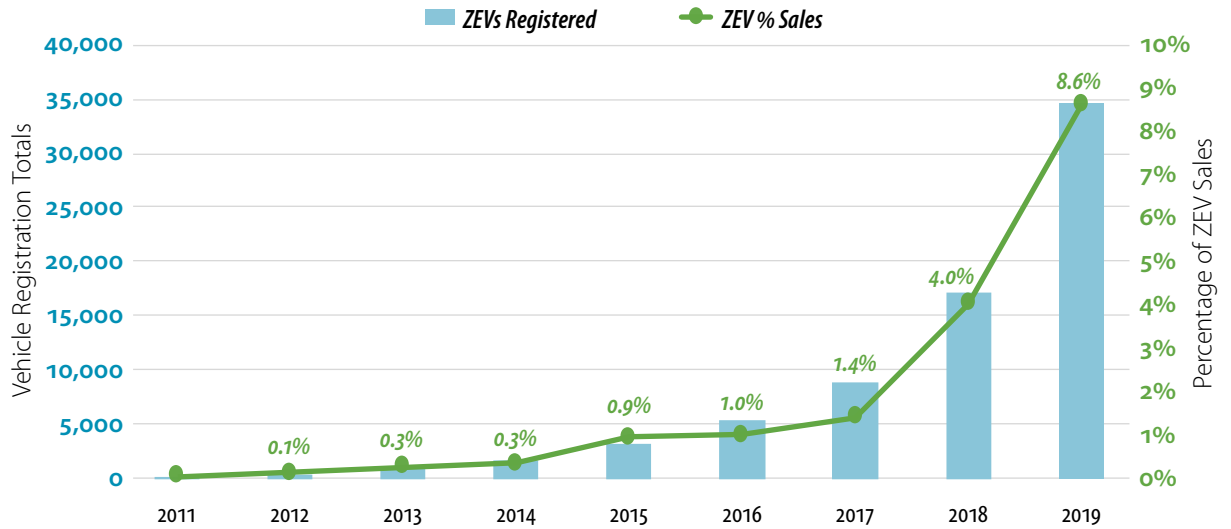
Another positive trend is the growing proportion of renewable content in transportation fuels. Low carbon fuels are created by blending in fuels from renewable sources. In 2018, the renewable content was 7.4 per cent in gasoline and 5.7 per cent in diesel, which is higher than the requirements in the Renewable and Low Carbon Fuel Requirements Regulation.<sup>7</sup>

Since 2007, annual public transit ridership in B.C. has grown by 27 per cent which equates to each British Columbian taking an average of 65 transit trips per year in 2018. TransLink has a goal of operating its fleet with 100 per cent renewable energy by 2050 and B.C. Transit has committed to a fully electric fleet by 2040.

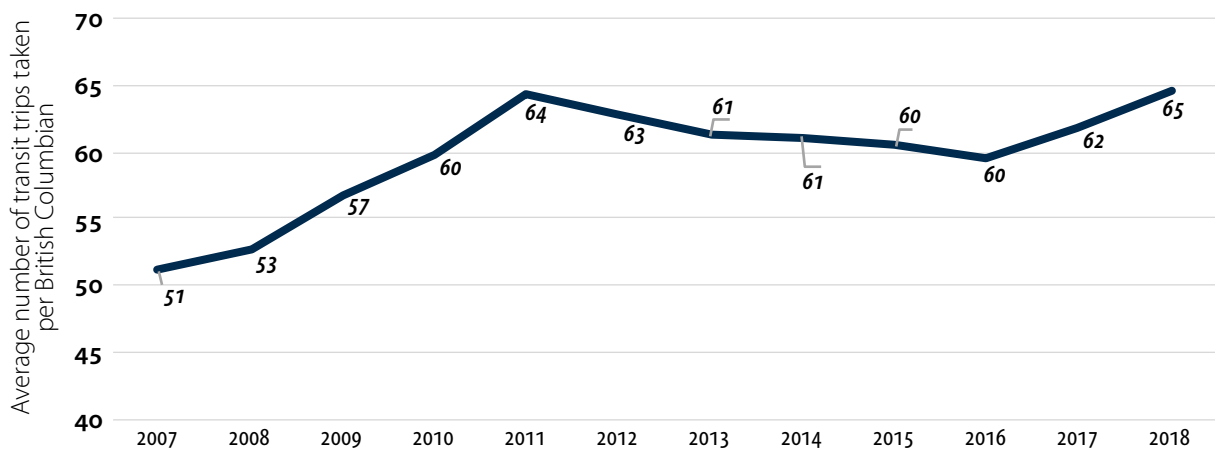
<sup>6</sup> Appendix A shows what we’re measuring year over year, along with the results we’ve seen since we started collecting the data.

<sup>7</sup> This data is valid at the time of calculation on December 9, 2019 and is based on the data provided by the fuel suppliers in their annual compliance reports.

## British Columbia Light-Duty Emission Vehicle Registration Totals and Sales Percentage in B.C. (2011–2019)



## Annual Public Transit Ridership



### 3.3.2 Industry

2017 emissions total: 25.3 Mt of CO<sub>2</sub>e (39 per cent of total)

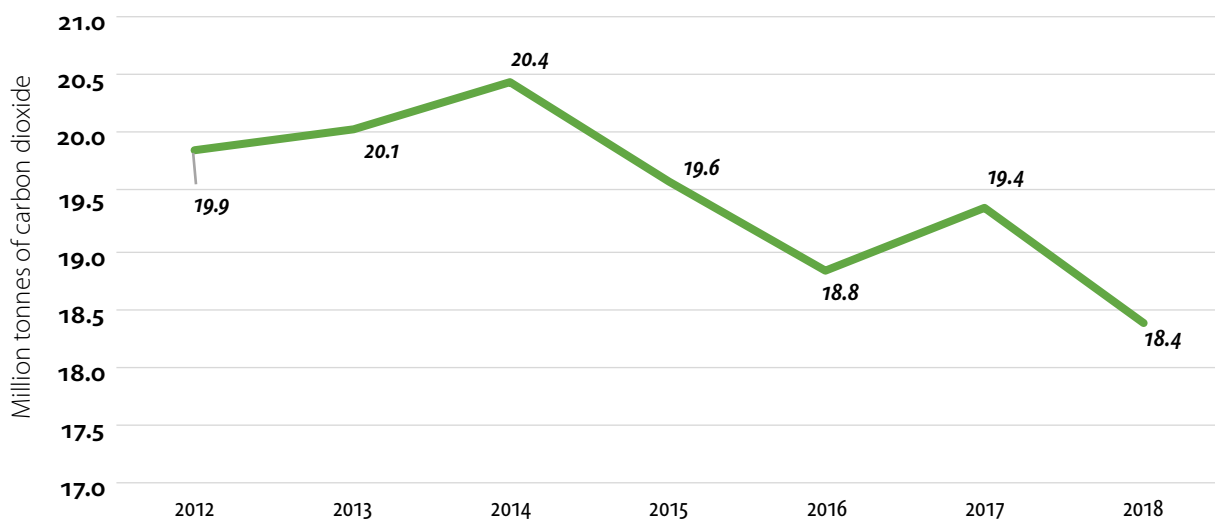
Emissions change from 2007: -1 per cent

Industry indicators measure the performance of B.C.'s industrial operations, tracking changes in the sector over time and monitoring the implementation of CleanBC policies.

B.C.'s Greenhouse Gas Emission Reporting Regulation requires industrial facilities emitting over 10,000 tonnes of CO<sub>2</sub>e per year to report their emissions. Since 2012, total emissions from these industrial operations have decreased by seven per cent to just over 18 Mt of CO<sub>2</sub>e in 2018, while the economy grew by over 18 per cent during this period.<sup>8</sup>

Methane is a powerful GHG with a global warming potential 25 times that of carbon dioxide on a 100-year timescale. Since 2014, reported fugitive and vented methane emissions in the upstream oil and gas sector have decreased 17 per cent while overall natural gas production has been increasing, meaning the industry has reduced the emissions intensity of B.C. natural gas.

#### GHG Emissions From Large Industrial Facilities In B.C.



<sup>8</sup> Note that the 18.4 Mt of CO<sub>2</sub>e represents emissions reported in 2018 by industrial facilities in B.C. emitting over 10,000 tonnes of CO<sub>2</sub>e per year that are required to report by The Greenhouse Gas Emission Reporting Regulation. The estimated total industrial emissions of 25.3 Mt of CO<sub>2</sub>e is based on the Provincial Inventory and includes emitters above and below 10,000 tonnes of CO<sub>2</sub>e per year and agricultural emissions, among other emission sources. Additional information on the Provincial Inventory can be accessed at <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/provincial-inventory> and additional information on emissions from operations that report under the Greenhouse Gas Industrial Reporting and Control Act can be accessed from <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/industrial-facility-ghg>

### 3.3.3 Buildings and communities

2017 emissions total: 14.0 Mt of CO<sub>2</sub>e (22 per cent of total)

Emissions change from 2007: -8 per cent

Building and communities indicators track emissions reductions progress in residential and commercial buildings, as well as waste and the provincial public sector.

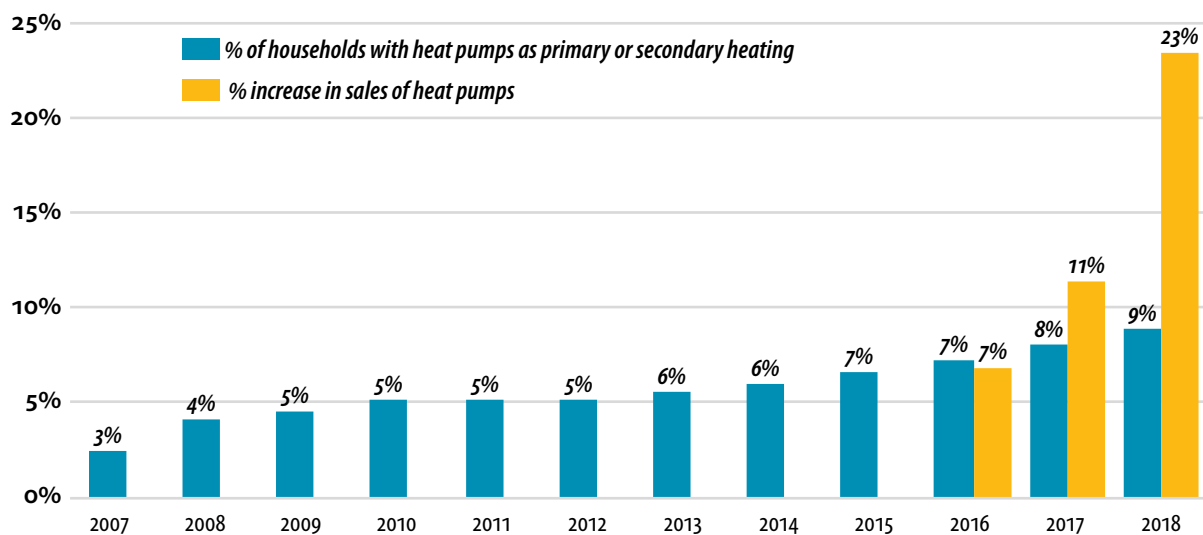
British Columbians have made significant progress reducing total energy use in residential and commercial buildings. Since 2007, residential energy use has decreased by 14 per cent, even as the amount of floor space increased by 18 per cent. Similarly, in commercial buildings, energy use has decreased by 15 per cent while floor space increased by 10 per cent. Both results show that our buildings have become more efficient through retrofits and cleaner new construction.

Heat pumps continue to gain in popularity. The percentage of households using them has increased from three per cent in 2007 to nine per cent in 2018 and heat pump sales in recent years have been increasing by double-digits. The number of heat pumps is likely to grow as we see results from programs such as CleanBC Better Homes and Buildings, which provide incentives for people to adopt cleaner technologies.

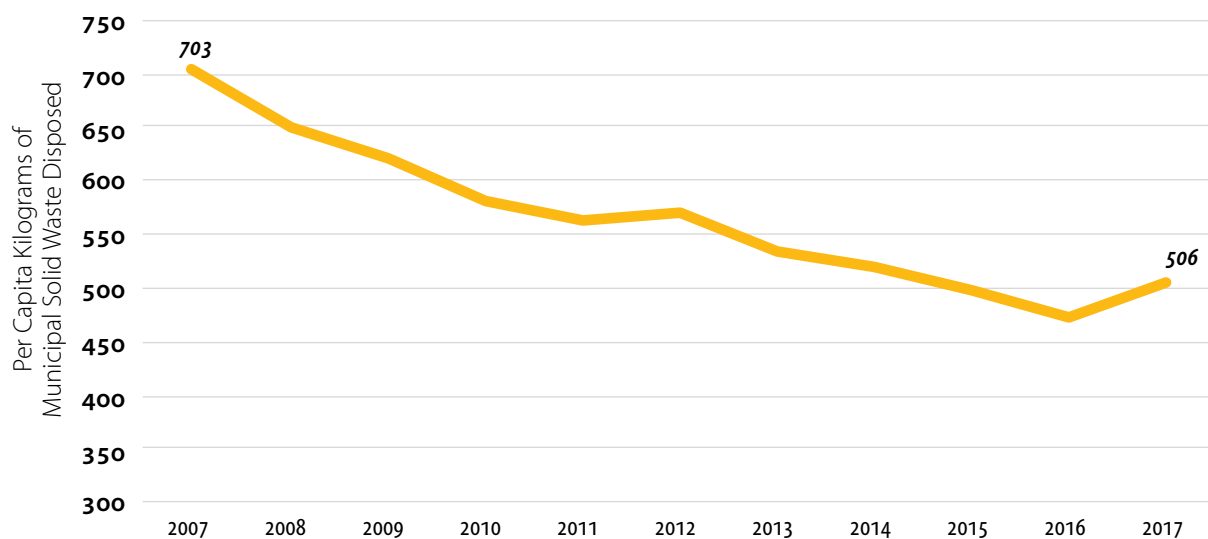
Our carbon neutral public sector has showcased B.C.'s leadership on climate change, reducing emissions by eight per cent since 2010. To reach net-zero, the Province makes investments in B.C.-based carbon offsets. A single offset represents one tonne of carbon dioxide equivalent removed from the atmosphere, or one less tonne released.

Waste is another important climate issue. When disposed in the garbage and buried in a landfill, organic wastes generate methane, a potent greenhouse gas. Since 2007, the amount of waste disposed in landfills or incinerated in B.C. has decreased by 28 per cent, from 703 kg per person per year in 2007 to 506 kg per person per year in 2017. This has been driven by the increase in organics diversion, food waste prevention, and extended producer responsibility programs in B.C. Currently, nearly 65 per cent of the population lives in a region that has organic waste disposal restrictions in place to encourage the prevention and diversion of organic waste and food scraps from landfills. Waste reduction efforts will become increasingly important as B.C.'s population continues to grow and landfills approach capacity. CleanBC policies to prevent and reduce organic waste and turn it into a valuable resource such as energy and compost should further reduce emissions due to lower waste volumes being disposed of in landfills.

## Heat Pump Systems and Sales



## Municipal Solid Waste Disposal



### 3.4 Carbon tax revenue and overall climate-related spending

B.C.'s carbon tax rate currently sits at \$40 per tonne and will increase annually by \$5 per tonne of CO<sub>2</sub>e emissions until we reach \$50 per tonne in 2021. The following tables outline the incremental carbon tax revenues resulting from the rate increases, which began in 2018. It also outlines the incremental expenditures for carbon tax rebates and measures to reduce climate pollution.

Funding under CleanBC was outlined in *Budget 2019*, including allocations for cleaner transportation, energy efficient buildings, Indigenous and remote communities, the CleanBC Program for Industry, and other programming under development. Other operating spending outside of CleanBC includes the First Nations Clean Energy Business Fund and the Forest Carbon Initiative. Capital spending includes the expansion of Vancouver's Broadway Subway and other major projects.

Table 1: Carbon Tax Revenue Forecast

\$ MILLIONS	ACTUAL	Q2 FORECAST
	2018/19	2019/20
<b>Carbon Tax Revenue</b>	1,465	1,690
<b>Annual growth</b>	210	225
<b>Growth due to base</b>	1	12
<b>Growth due to rate</b>	209	213
<b>Growth due to rate—cumulative</b>	<b>209</b>	<b>422</b>

Table 2: Spending Related to Clean Initiatives

\$ MILLIONS	INCREMENTAL FROM 2017/18	
	ACTUAL 2018/19	/20
<b>Climate action tax credit</b>	40	72
<b>CleanBC—operating and capital</b>	39	226
<b>Other operating spending</b>	17	21
<b>Transit projects and other capital</b>	15	132
<b>Total clean spending</b>	<b>111</b>	<b>451</b>

## 4 WHAT WE'VE ACCOMPLISHED

---

In the year since CleanBC was released, we've made progress across a range of areas, from transportation to industry to homes and buildings. The following section summarizes what we've achieved and offers some examples of how British Columbians are meeting the challenges of climate change.

### 4.1 Getting around

CleanBC laid out a path to reducing GHG emissions from transportation by bringing down the price of electric vehicles and speeding up the switch to cleaner fuels. In CleanBC's first year, we're making progress on both fronts, led by unprecedented sales of light-duty electric vehicles in 2019, with more work to come on the medium-duty and heavy-duty front.

CleanBC is all about making life better for British Columbians. When it comes to how we get around, that means continuing the shift away from old technologies to new, cleaner options, so we can all enjoy cleaner air and healthier communities.

Since the release of CleanBC, we've been working with a range of partners to deliver electric vehicles, cleaner fuels and active transportation solutions that make it easier to get where you're going, with less emissions and less time in gridlock.

#### 4.1.1 *More electric vehicles (EVs) on the way*

In 2019, almost one in 10 vehicles purchased in B.C. were electric. That's not surprising, considering the benefits. Electric vehicles (EVs) are cleaner and cost less to operate—about 75 per cent less than conventional vehicles. So making the switch makes sense.

CleanBC is helping with:

- rebates to make EVs more affordable
- legislation to make EVs more widely available, and
- support to grow the EV industry in British Columbia

### ELECTRIFYING RESULTS FROM ZERO-EMISSION FLEETS

Electric vehicle fleets are turning out to be a real crowd-pleaser. Passengers enjoy the quiet ride, companies like the reduced maintenance costs, and drivers are proud to be behind the wheel. And there are now more affordable choices, due in part to CleanBC commercial vehicle rebates.

With three electric buses and four electric harbour ferry boats, Vancouver's Westcoast Sightseeing is leading the way for tourism. Rob Safrata, owner of Westcoast Sightseeing, sees electric buses becoming increasingly popular. "We've had our seasonal drivers return year after year because they like the experience of driving an electric bus and they are proud of it. We've also heard from our customers that they love a quiet bus as they take in the beautiful scenery of B.C.'s west coast," said Safrata. "But what we all have in common is that we're all working to reduce our emissions and that's why we'll keep doing what we're doing."

Fleet operators in companies like WestCoast Sightseeing are not only helping to reduce carbon pollution in B.C. but are learning it can also help to improve their bottom line.



## Bringing down the price of EVs

Historically, costs have been a major barrier to widespread adoption of EVs. As we get more and more EVs on the road, the price differential continues to shrink, and point-of-sale rebates are levelling the playing field.

B.C. currently offers \$3,000 in rebates on cleaner cars through the Go Electric program. In 2019, the federal government introduced its own rebate, allowing British Columbians to save up to \$8,000 on a new EV with a price tag of up to \$55,000.

Together, the provincial and federal incentives produced an unprecedented surge in B.C. EV sales, prompting the Province to adjust its program to allow more people to participate.

British Columbians responded. Sales of electric and plug-in hybrid vehicles in B.C. more than doubled in 2019, compared to the same period a year before—making up almost nine per cent of new light-duty sales. They now account for almost two per cent of all light-duty vehicles on our roads, up from 1.5 per cent in 2017. With new electric pick-up trucks coming to the market in 2020, we expect further uptake as more people are able to find an EV that meets their needs. By 2030, the Province expects EVs to make up 30 per cent of new vehicle sales.

CleanBC is a key part of keeping this momentum going. Since its release we've seen:

- More than 17,000 new EVs on the road
- More than 40 new direct current (DC) fast charging sites, and
- New rebates for EV charging stations in homes and workplaces

### B.C. IS GOING ELECTRIC

Go Electric is B.C.'s program to encourage and accelerate the adoption of electric vehicles by:

- Bringing down the price of EVs
- Making it easier to charge or fuel an EV
- Supporting research, jobs training and economic development in B.C.'s EV sector

*Budget 2019* committed over \$90 million for the program. For details, go to <https://goelectricbc.gov.bc.ca/>

## Expanding our public charging network

British Columbia's public charging network is one of the most extensive in the country, and it's expanded significantly since the launch of CleanBC. We now have 148 DC fast charging sites<sup>9</sup>—up from 105 a year ago. Fast charging is essential for long-distance driving and commercial fleets. Charging times vary, but many vehicles can get an 80 per cent charge in about an hour.

The build-out of the public charging network will continue as we work towards our 2030 targets, making the switch to EVs more practical than ever.

---

9 Number of charging sites is as of September 2019, with data provided by PlugShare

## Expanding home and workplace charging

In 2019, the Province announced over \$4 million in new rebates for EV charging stations in homes and workplaces. The rebates are delivered in partnership with BC Hydro and FortisBC, helping to get more B.C. buildings ready for EVs.

Homeowners installing a Level 2 charging station in a single-family home can get a rebate of \$350.

Condominiums, apartments and workplaces can receive rebates of \$2,000, along with up to five hours of free support from an EV charging station advisor.

For details go to: <https://goelectricbc.gov.bc.ca/>

## Expanding the hydrogen network

B.C. is a world-leader in hydrogen fuel cell technology for transportation, with major automakers and the fuel cell industry investing heavily in our research and development sectors. We currently have two public hydrogen fuelling stations in the Vancouver area; we're working with our partners to open four more by the end of 2020. This work is part of a broader strategy to build on B.C.'s hydrogen advantage.

## Switching to electric by 2040

As promised in CleanBC, the Province has passed a new law to make sure British Columbians have access to the numbers and types of zero-emission vehicles they want. The *Zero-Emission Vehicles Act* was passed in May 2019, requiring all new light-duty vehicles sold in B.C. to be zero-emission vehicles by 2040. Along with making more EVs available at more affordable prices, the legislation will help ensure our GHG reduction targets are met.

Automakers will be required to meet an escalating annual percentage of new light-duty EV sales, reaching:

- 10 per cent in 2025
- 30 per cent in 2030, and
- 100 per cent by 2040

Regulations to implement the Act are now being developed. Consultation with stakeholders began in October 2019.

Bringing in the standard over time will allow automakers to offer a greater diversity of models and vehicle types to meet drivers' needs—building on the progress made since 2011 when the Province introduced its first clean-energy vehicle program. At that time, only a small number of electric vehicles were available, hydrogen fuel cell vehicles weren't available to the public, and there weren't many places to charge an electric car.

### MAKING IT EASIER TO CHARGE OR FUEL

Mount Robson Provincial Park is the first in B.C.'s northeast to offer EV charging stations. Robson River Campground recently added 22 electric sites. They include an RV charging station and an EV charging connection with 50-amp service. The Province has also installed 18 EV charging stations at provincial highway rest stops across B.C.

Today, B.C. drivers can choose from nearly 50 electric vehicles, with EV charging stations available throughout the province and right across the country. We also have a growing number of hydrogen fuel cell vehicles and fuelling stations.

The new legislation will accelerate these trends, helping to ensure that cleaner vehicles are as widely available and competitively priced as possible. It will also support the growth of B.C.'s broader EV sector, which employs about 3,850 people and contributes approximately \$700 million a year in direct economic activity to the province<sup>10</sup>.

## Supporting innovation and business development

With EV sales taking off, B.C. companies are building on their strengths to support the growth of this emerging industry. The Go Electric Advanced Research and Commercialization (ARC) Program is helping, by supporting B.C. companies and encouraging new international investment. Funding is available for:

- Pre-commercial research and development of a B.C.-based EV product, service or technology
- Commercialization of a B.C.-based EV product, service or technology, including investments in manufacturing facilities or processes, and
- Use or demonstration of a B.C.-based EV product, service, or technology

In 2019, three B.C. companies received approximately \$500,000 through the ARC program to further develop the EV sector, create good jobs and support low-carbon innovation:

- Eagle Graphite of Nelson received \$290,000 to produce silicon/graphite battery anodes—bringing new jobs to the Kootenays and potentially establishing B.C. as a global leader in anode production
- Burnaby's AVL Fuel Cell Canada received \$147,000 to develop an advanced fuel cell model for research and series development applications in the automotive sector
- Richmond-based IRDI Systems received \$55,000 to develop a hydrogen fuelling nozzle, using made-in-B.C. clean tech to make fuel-cell vehicles more user-friendly. The nozzle will enable clean commercial fuel-cell vehicles to fuel more quickly, making them more appealing and accessible to fleets around the world

The ARC program will be putting out another call for projects in 2020. For details go to [www.arcbc.ca](http://www.arcbc.ca).

---

<sup>10</sup> Data from 2016 Clean Energy Vehicle Economic Opportunities Assessment.

## 4.1.2 Speeding up the switch to cleaner fuels

### Cleaner transportation fuels

#### Low Carbon Fuel Standard

B.C.'s Low Carbon Fuel Standard (LCFS) is a powerful tool in the fight against climate change. Between 2010 and 2018, it kept more than 9.1 million tonnes of GHG emissions out of our atmosphere.<sup>11</sup>

The LCFS requires suppliers to decrease the average life-cycle carbon intensity of their transportation fuels to achieve a 10 per cent reduction by 2020. The CleanBC plan builds on that, requiring a 20 per cent reduction by 2030, further reducing our reliance on fossil fuels.

Since the release of CleanBC, we've been consulting with industry and other stakeholders to determine the best ways to meet our 2030 target.

To increase the supply of cleaner fuels, the Province is providing new incentives for production, supporting our 2030 target of 650 million litres of renewable/biogasoline and diesel every year. Renewable fuels like RNG (renewable natural gas) can go straight into vehicles, while bio-fuels are blended with conventional gas or diesel to reduce their carbon intensity.

Since the release of CleanBC, we've been examining ways to meet this target, including:

- expanding our existing renewable fuel production industry, and
- supporting commercial production of renewable and low-carbon fuels.

The Province will also support our refineries in Burnaby and Prince George to develop the ability to refine both fossil crude and bio crude from a variety of waste and renewable sources.

#### Tailpipe emissions standards

In June 2019, Canada announced it would align its tailpipe emission standards with the state of California, rather than with the U.S federal government. The change responds to an American directive to weaken standards and allow more pollution. California has long had authority to set its own standards, which are significantly stricter than the national rules.

B.C. supports the Government of Canada's position and will adopt California tailpipe emission standards for vehicles sold after 2025.

#### CLEANER FERRIES, SHORTER WAITS

The B.C. and federal governments are joining forces to purchase a new electric-ready vessel for the Kootenay Lake ferry service. It will be used in tandem with the larger MV Osprey 2000 to significantly decrease wait times for users during peak seasons. The project is part of the CleanBC commitment to achieve full electrification of the inland ferry fleet by 2040.

Meanwhile, B.C. Ferries has just added two battery electric-hybrid vessels to its fleet and will be adding four more by 2022, as part of its commitment to progressively lower emissions.

<sup>11</sup> This data is valid at the time of calculation on December 9, 2019 and is based on the data provided by the fuel suppliers in their annual compliance reports.

### 4.1.3 Less time in gridlock

#### Active transportation

The Province's first active transportation strategy, "Move. Connect. Commute." was launched at the B.C. Active Transportation Summit in June 2019. The strategy was developed after a province-wide consultation, which included eight regional sessions, meetings with local governments and an online engagement process that garnered over 1,800 comments from British Columbians. People offered lots of good ideas for improving active transportation links between neighbourhoods, transit facilities and town centres.

**Here's another reason to switch to electric. High Occupancy Vehicle (HOV) lanes throughout B.C. are open to all electric vehicles with an official decal, regardless of the number of people on board.**

The strategy reflects what people told us. It's designed to double the number of trips taken with active transportation by 2030, reducing pollution and supporting better health, while making communities cleaner and more liveable. The strategy identifies 36 actions, some of which are already underway. Since June 2019 we've:

- introduced the Active Transportation Grant Program (formerly BikeBC) to support all types of active transportation infrastructure such as pedestrian safety improvements to sidewalks, improved lighting along pathways and end of trip facilities that make active transportation more convenient
- launched a cycling education pilot program for grade four and five students
- expanded support for Bike to Work & School Week in fall as well as spring, and to encourage walking as well
- conducted a survey to learn more about how people travel and barriers preventing them from using active transportation
- introduced the B.C. Active Transportation Design Guide to provide a useful tool for all communities that will help create consistency in the design of active transportation facilities, making it easier for all levels of government to incorporate active transportation into their infrastructure planning. The Design Guide recently won the 2019 Bill Curtis Award for Project of the Year, the top award from the Canadian Institute of Transportation Engineers' of Greater Vancouver

#### E-BIKES

Electric bicycles are gaining popularity and B.C. companies are part of the push to make them more efficient and affordable. For example, Vancouver's ENVO Drive Systems makes battery packs, motors, controllers and drive systems for e-bikes, along with a range of innovative products including an electric snowmobile. Their retail affiliate, EBikeBC, builds and sells e-bikes throughout B.C. as well as in Alberta and Quebec.

According to Transport Reviews, an international journal covering all aspects of transport, the growth in sales of e-bikes around the world is the largest and most rapid uptake of alternative-fuelled vehicles in the history of motorization.

Under B.C.'s active transportation strategy, people who scrap their old vehicles can get \$850 towards the purchase of an e-bike.

B.C. has also amended the *Motor Vehicle Act* and updated its cycling policy and cost-sharing infrastructure program to include all modes of active transportation, including electric bikes, scooters and skateboards. The updates will better reflect the choices British Columbians are making every day and help to make cleaner options more convenient and accessible. The Province will also partner with communities to research and test how new mobility technologies work best for British Columbians.

### Public transit—10-year plan

Public transit is a tried and true way of reducing GHG emissions. It provides an affordable alternative to driving and supports the development of cleaner, more compact and energy-efficient communities. Since most transit trips involve some walking, it also contributes to better health and, with fewer cars on the road, traffic is less congested. That means drivers spend less time idling, burning fuel while going nowhere.

Considering the benefits, it's no wonder governments at all levels support public transit. In the next 10 years, B.C., Canada and local governments will invest more than \$8 billion in B.C. through the Public Transit Infrastructure Fund and the Investing in Canada Infrastructure Program to improve the capacity, accessibility and safety of transit systems. In Metro Vancouver, this includes SkyTrain extensions, upgrades and new train cars. Across B.C. it means new buses, transit exchanges and bus shelters.

### Public transit—progress since CleanBC

In July 2019, B.C. Transit released its Low Carbon Fleet Program, setting out a pathway for replacing its buses with lower and zero-emission vehicles. Starting in 2023, the corporation will buy only electric buses, with a target of creating a fully electric fleet by 2040.

In 2019, 10 new electric battery buses were purchased for deployment in 2021. B.C. Transit is also introducing new compressed natural gas (CNG) buses and fuelling infrastructure to Victoria and the Central Fraser Valley, building on its current fleet of 128 CNG buses operating out of Whistler, Nanaimo and Kamloops.

In Victoria, new bus lanes were completed on Douglas Street/Highway 1, helping to reduce congestion, speed up commutes and make transit more convenient.

In Metro Vancouver, TransLink launched its first four, non-trolley electric buses in September 2019 with six more on the way. Each bus is expected to reduce 100 tonnes of GHG emissions and save \$40,000 a year in fuel costs compared to conventional diesel buses.

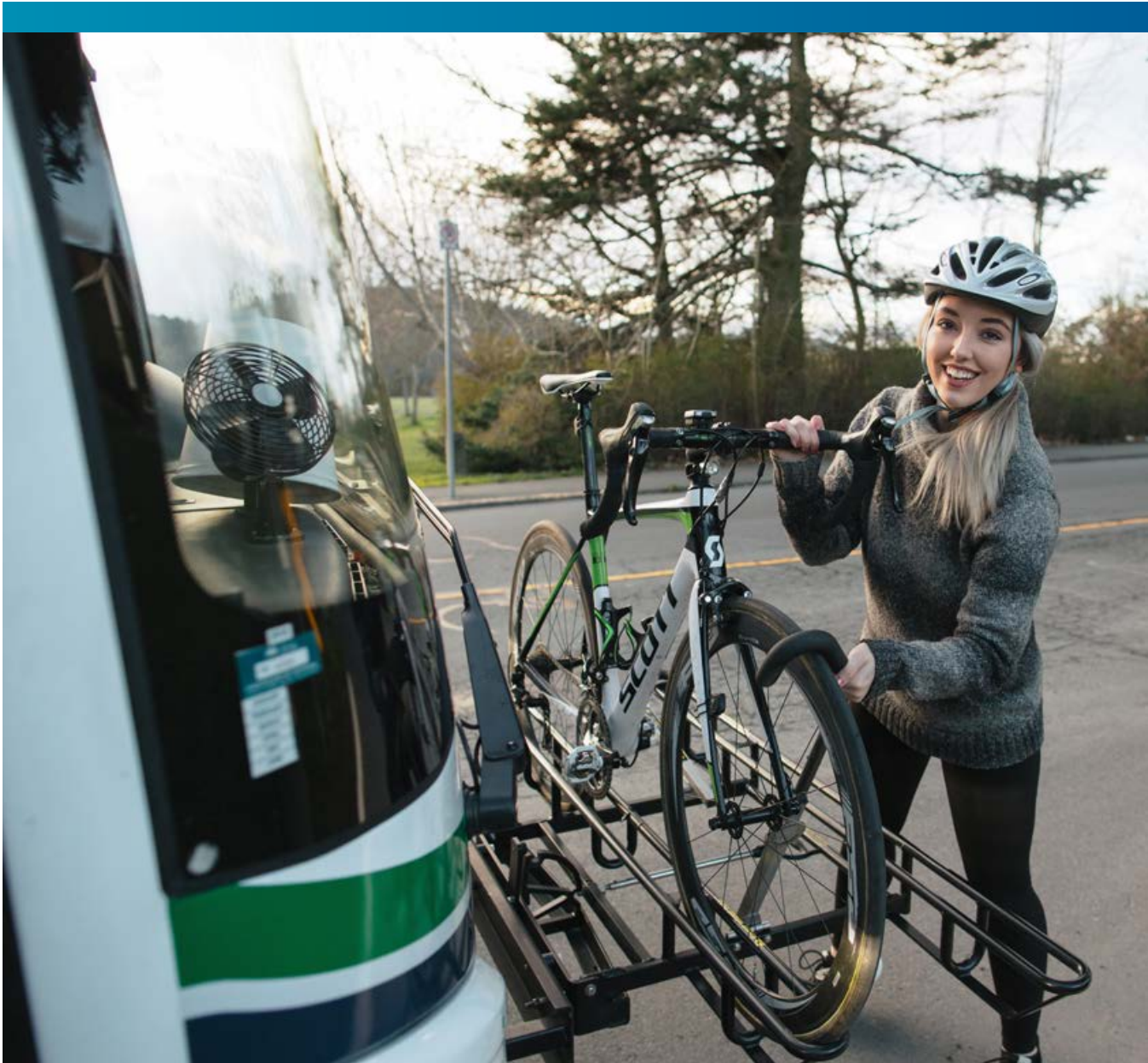
More than half of TransLink's bus fleet now operates with low-carbon technology such as zero-emission electric trolleybuses, compressed natural gas and hybrid diesel-electric buses. By 2050, its goal is to run its fleet with 100 per cent renewable energy.

TransLink also added 28 new SkyTrain cars in 2019 and will roll out an additional 52 SkyTrain and Canada Line cars in 2020, allowing more people to use the fully electric SkyTrain system.

All of these improvements will build on our progress in making transit more effective and accessible. Since 2007, annual public transit ridership in B.C. has grown by 47 per cent.

## Integrated transportation and development planning

B.C. government ministries and agencies are working with partners to better integrate transportation and land use planning, supporting the development of compact communities with easy access to transit and other clean transportation options. The goal is to help more people find affordable housing, live closer to their jobs, and access a full range of services close to home, reducing the need for commuting and helping to reduce both congestion and GHG emissions. The work is guided by the Province's Integrated Transportation and Development Framework, which articulates a 20-year vision for transportation planning and investment.



## 4.2 Improving where we live and work

CleanBC set out a path to reducing GHG emissions from buildings by making every new building more energy efficient, providing incentives to improve existing buildings, increasing the supply of renewable fuels for buildings, and helping remote communities switch from diesel to cleaner alternatives. We're making progress in all of these areas, with thousands of people getting rebates through updated programs to help make their homes more energy efficient, more remote communities adopting clean solutions, and work underway with partners to strengthen the B.C. Building Code.

Our homes, schools, workplaces and other buildings play a big role in a cleaner province and a stronger economy. For example, every dollar we invest in energy efficiency generates up to four times its value in economic growth. And the growing green building sector employs thousands of people in communities across B.C.

Reducing emissions in the built environment remains a challenge, partly because our buildings have long lifespans. That's why CleanBC is focused on renovations and retrofits as well as new construction. It's helping to build the market for new, made-in-B.C. technologies, ideas and building materials, and supporting growth in the well-paying construction trades sector.

### **B.C. – LEADING THE COUNTRY IN ENERGY EFFICIENCY**

A new national scorecard, issued for the first time in 2019, ranks B.C. number one among the provinces for energy efficiency. The Provincial Energy Efficiency Policy Scorecard assesses efficiency policies and performance in: energy efficiency programs, enabling measures, buildings, transportation and industry.

The rankings were compiled by Efficiency Canada, a national organization housed at Carleton University's Sustainable Energy Research Centre. CleanBC Better Homes, the B.C. Energy Step Code and support for electric vehicles were among the actions singled out as best practices that other jurisdictions can learn from.

For more on the scorecard go to <https://www.scorecard.efficiencycanada.org/wp-content/uploads/2019/11/British-Columbia-Canadas-Energy-Efficiency-Leader.pdf>

### 4.2.1 Better buildings—making future buildings more energy efficient

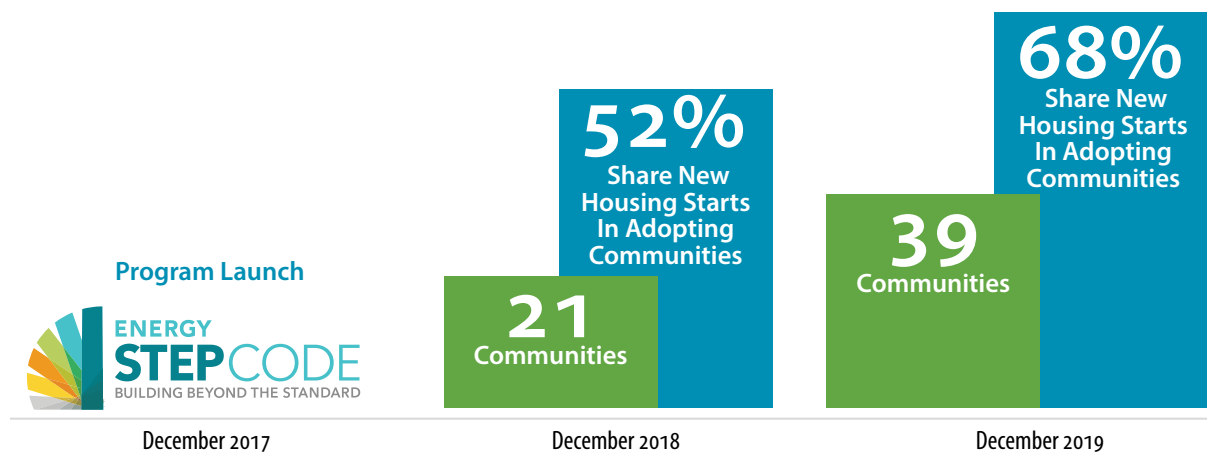
#### Strengthening the B.C. Building Code

By 2032, the B.C. Building Code will require all new buildings in the province to be net-zero energy ready. That means they'll be so efficiently designed and built that they could meet all or most of their energy needs with renewable energy technologies.

Since the release of CleanBC, progress in this area has focused on the BC Energy Step Code, which sets out a series of efficiency requirements beyond the base B.C. Building Code, providing a path for builders and local governments to reach the 2032 target.

The BC Energy Step Code is voluntary but local governments in 39 communities, including Vancouver, Campbell River, Nelson, Summerland and Smithers, now reference it in some way (i.e. in council endorsement, incentive program or bylaw), up from 20 a year ago. The Province has also expanded the BC Energy Step Code to apply to public sector buildings and is working with partners to develop associated energy performance targets.

#### BC Energy Step Code Expansion since 2017



#### New and updated energy efficiency standards

In the fall of 2019, the Province proposed and consulted on new and updated standards for residential windows, residential gas boilers and commercial gas boilers. The proposed standards, under the Energy Efficiency Act, will deliver on CleanBC commitments and support the joint federal-provincial-territorial Market Transformation Roadmap for Energy Efficient Equipment in the Building Sector.

#### Net Zero Energy Ready Challenge

The Net-Zero Energy-Ready Challenge (NZERC) is one of many CleanBC programs aimed at making buildings all over the province less polluting, more comfortable and more energy-efficient. Net-zero energy ready buildings are built to the highest steps of the Energy Step Code, minimizing energy use and demonstrating that builders can achieve the 2032 requirements with skills and technology available today.

Since the competition was announced in October 2018, 51 expressions of interest were submitted, naming more than 170 different organizations as proponents, suppliers or partners.

In January 2019, 16 projects were selected as winners of design incentives. They then submitted more detailed applications for building incentives.

Of these 16 projects, 11 were chosen in June 2019 and received incentives worth up to \$390,000 each. For a list of the winners, go to <https://news.gov.bc.ca/releases/2019EMPR0080-001390>

### LEARNING OPPORTUNITIES IN SMARTER BUILDINGS

An award-winning new residential building in the greater Victoria area is showcasing best practices in sustainable building design. Corvette Landing, with 83 units from studios to three-bedroom penthouses, is one of the first residential projects in B.C. to feature mass timber construction combined with prefabrication and Passive House certification.

The building is one of 11 winners of the Net-Zero Energy-Ready Challenge, one of many CleanBC programs aimed at making buildings all over the province less polluting, more comfortable and highly energy-efficient.

This 12-storey mixed-use development offers terraced living, rooftop gardens and a courtyard together with common amenities and commercial space, all in one high-performance, affordable building. It is part of a system called “Platforms for Life,” which as an innovative approach to improving sustainability can be replicated or scaled up in other building designs.



## BUILDING ON THE NATURAL ADVANTAGE OF OUR FORESTS

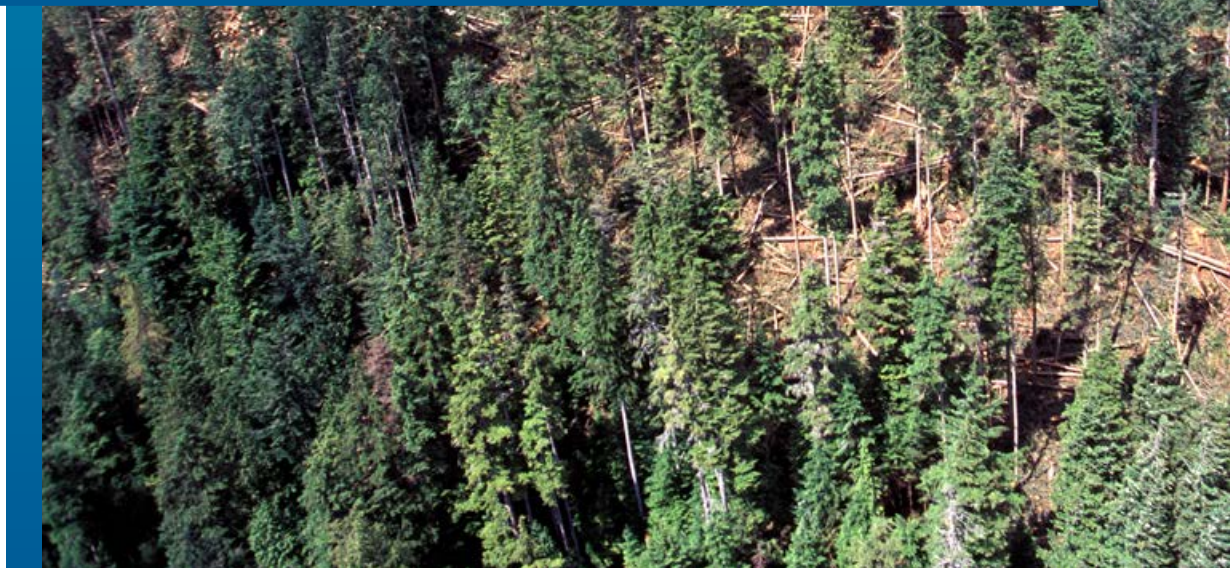
Forestry has long been a major contributor to our economy, providing jobs and revenues along with a wide range of products we rely on. Because they're renewable, wood products have an environmental advantage, plus, trees store carbon as they grow and, when we build with wood, we lock that carbon in, keeping it out of the atmosphere.

B.C. is recognized around the world as a centre of excellence for wood building and design. Our architects and engineers are leaders in designing taller and larger wooden buildings. Demand for these buildings is expected to grow across Canada, beginning in 2020. That's when changes to the model National Building Code take effect, allowing for wood buildings up to 12 storeys high, up from the current allowance of six storeys.

B.C. is already ahead of the curve, working with communities to build safe, secure and green tall wood buildings, creating jobs, growing B.C.'s value-added sector and helping to realize our low-carbon future. For example, in March 2019, Kalesnikoff Lumber announced plans for a new, \$35 million mass-timber facility, creating 50 new jobs in the West Kootenays by summer 2020. Mass timber is a type of construction that uses large, pre-fabricated wood panels for walls, roofs and floors.

The Province is inviting eligible local governments to become early adopters of mass-timber technology. The University of British Columbia along with 12 local governments, have already signed on, collectively representing 35 per cent of all housing starts in B.C. in 2018. The early adopters are:

- |                           |                  |            |
|---------------------------|------------------|------------|
| ■ City of North Vancouver | ■ Abbotsford     | ■ Kelowna  |
| ■ Township of Langley     | ■ Campbell River | ■ Mission  |
| ■ Colwood                 | ■ Langford       | ■ Victoria |
| ■ Surrey                  | ■ Richmond       | ■ Saanich  |

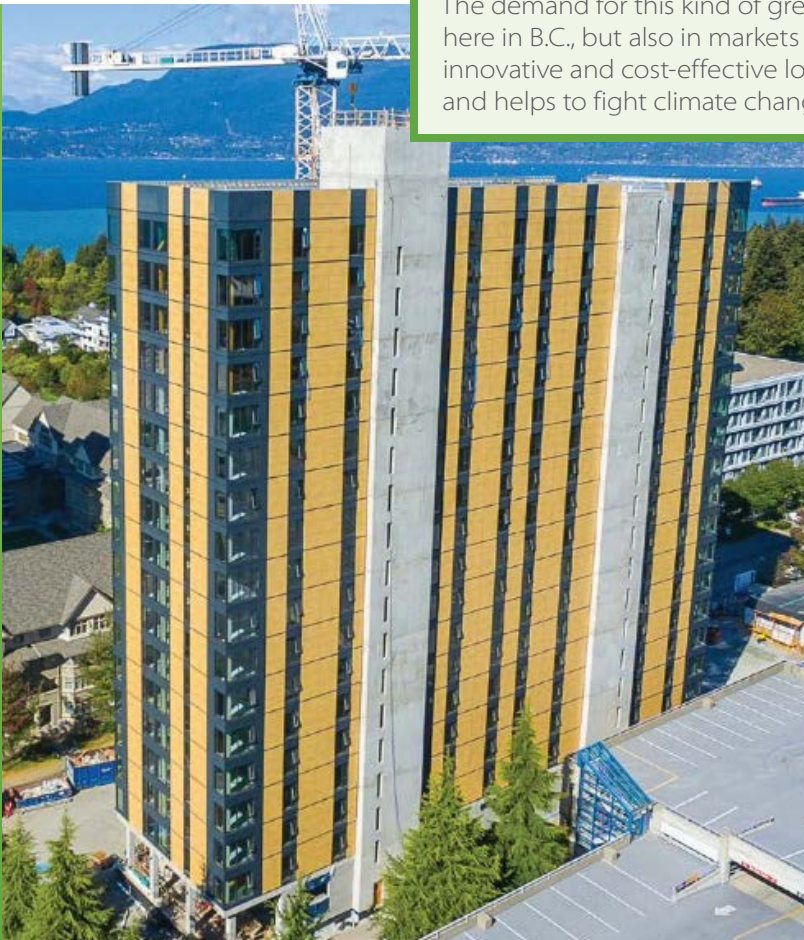


### MASS TIMBER CREATING NEW POSSIBILITIES FOR GREEN BUILDINGS

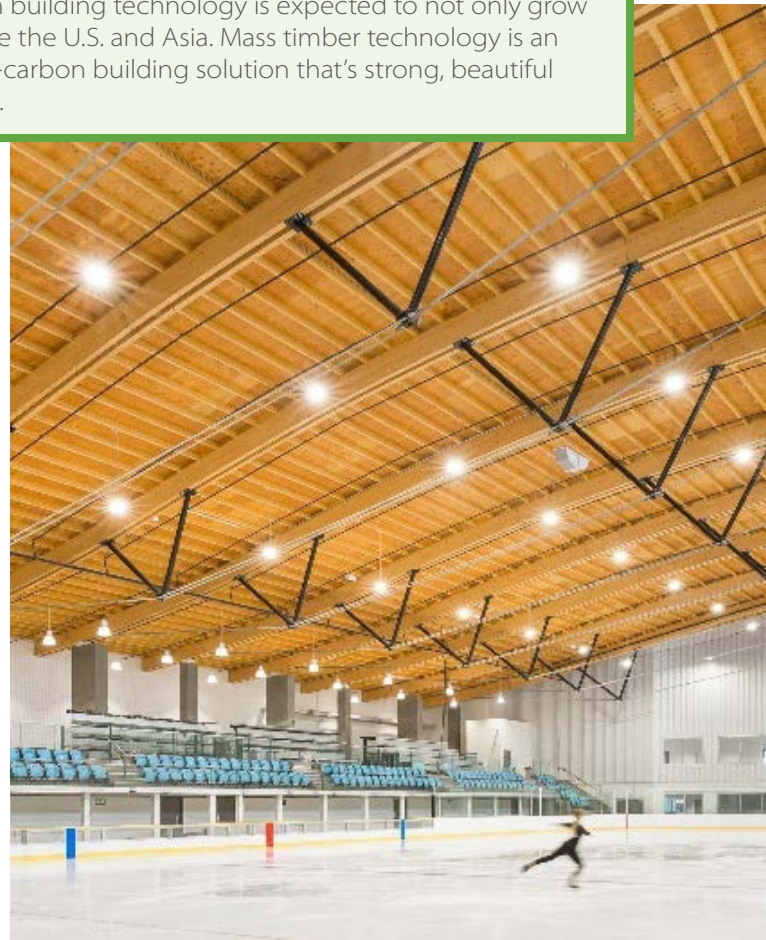
Thanks to a winning combination of strength, beauty and sustainability, the use of mass timber is on the rise in B.C. Mass timber is a new generation of engineered wood products made for large-scale building construction. Its increasing popularity is due in part to changes to B.C.'s building code that allow new buildings to use engineered wood for up to 12 storeys.

B.C. companies, Structurlam, StructureCraft and Kalesnikoff, are showing first hand just how quickly the industry is growing. Structurlam Mass Timber Corporation, with four Canadian facilities, was North America's first manufacturer of cross-laminated timber and has just announced its expansion with a new facility in the U.S. It has worked on such high-profile projects as UBC's Brock Commons and the Wood Innovation and Design Centre in Prince George. StructureCraft has recently constructed a new facility in Abbotsford, where they manufacture dowel-laminated timber. They have engineered and built B.C. projects such as the North Surrey Sport & Ice Complex and the Richmond Olympic Oval. A third manufacturer, Kalesnikoff is also expanding and building a new facility that will produce various types of mass timber.

The demand for this kind of green building technology is expected to not only grow here in B.C., but also in markets like the U.S. and Asia. Mass timber technology is an innovative and cost-effective low-carbon building solution that's strong, beautiful and helps to fight climate change.



UBC's Brock Commons was built using mass timber supplied by Structurlam Mass Timber Corporation, and when completed in 2017, was the tallest wood building in the world, storing about 1060 tonnes of carbon.



The North Surrey Sport & Ice Complex features StructureCraft's timber roof panel and long-span timber-steel trusses.

### 4.2.2 Supporting better buildings now

#### CleanBC Better Homes and Better Buildings

Energy-efficient buildings help create a cleaner future while making life more comfortable and more affordable. To help more families, businesses and communities reap the benefits, the Province created CleanBC Better Homes and Better Buildings (formerly Efficiency B.C.). The program offers online hubs for residential ([betterhomesbc.ca](https://betterhomesbc.ca)) and commercial ([betterbuildingsbc.ca](https://betterbuildingsbc.ca)) customers to access information, rebates and support to reduce energy use and GHG emissions in new and existing homes and buildings.

Since the release of CleanBC:

- More than 6,700 households have benefited, for example by upgrading to heat pumps in homes and non-profit housing
- 47 capital incentive projects have been approved for businesses and public sector organizations. These include installing heat pumps, heat recovery chillers and high efficiency gas equipment

CleanBC has also enabled a significant expansion of program offerings, which now include:

- Up to \$3,500 in rebates for replacing a gas or oil furnace with an electric air-source heat pump (a 75 per cent increase from before CleanBC), with some municipalities adding up to an additional \$7,000
- Up to \$2,000 for high-efficiency windows and door rebates in gas or oil-heated homes (double the previous incentive, with a broader list of eligible products)
- New coverage of insulation in oil-heated homes and in northern residences served by Pacific Northern Gas, with new rebates of up to \$4,300
- An expanding list of higher-value rebates for low-income households
- Bonus rebates of up to \$2,000 for completing multiple home upgrades
- Rebates of up to \$200,000 for low-carbon heating systems in existing commercial, institutional, and multi-unit residential buildings, and up to \$500,000 in new construction (added since the release of CleanBC)
- Rebates of up to \$20,000 for energy studies to identify cost-effective improvements in existing commercial buildings, multi-unit residential buildings and non-profit housing, and up to \$15,000 in new construction (added since the release of CleanBC)
- Easy-to-use incentive search tools and resources, now including program-registered contractor and energy advisor lists, resources for contractors, and energy step code information
- Free energy coaching services for homeowners, builders, contractors, and now also small businesses and Indigenous communities, including a phone and email hotline staffed by energy coaching specialists

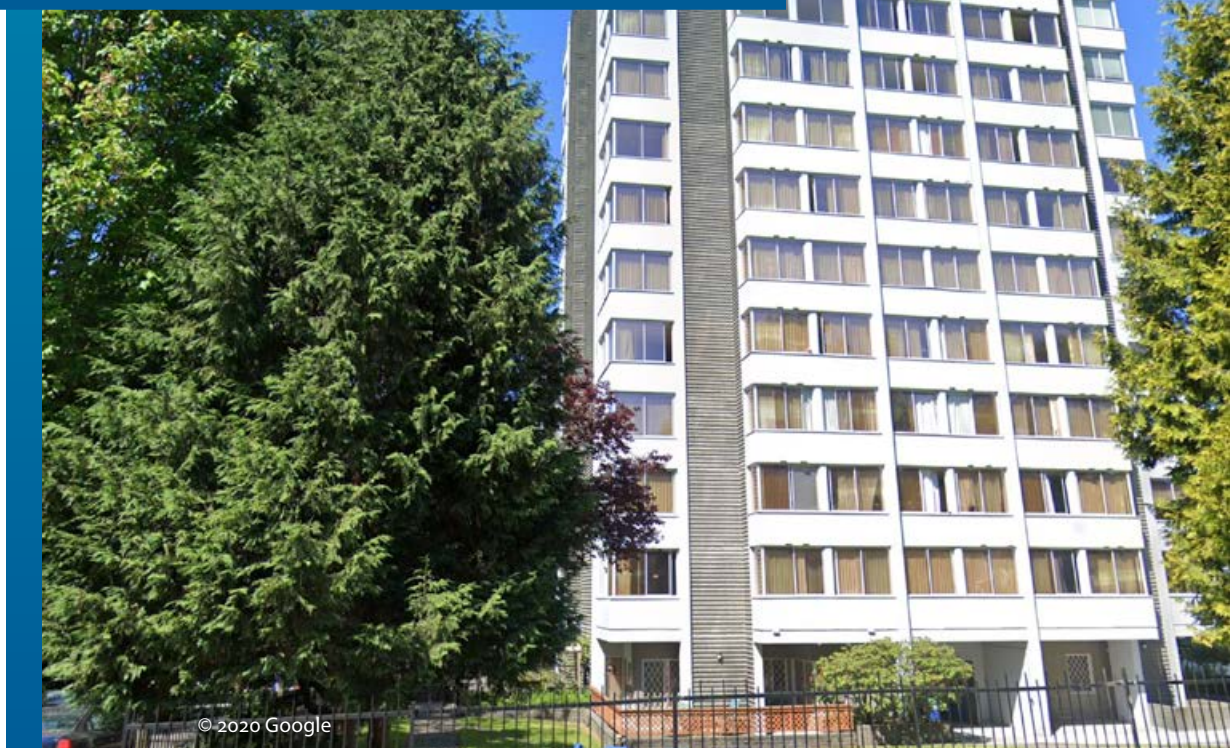
Programs in development:

- Incentives for Indigenous communities, integrated with specialized support and bulk buy coordination
- Low-interest financing option for residential efficiency upgrades
- New incentives for residential new construction
- Pilot program for rental apartments

### ENERGY RETROFITS FOR SOCIAL HOUSING

In Budget 2018, B.C. committed over \$1 billion over 10 years to upgrade social housing, including retrofitting 51,000 units of publicly owned social housing, making them cleaner, more comfortable and more energy efficient.

For example, retrofit work at Grandview Terrace in East Vancouver is expected to reduce the property's GHG emissions by 23 per cent from a 2005 baseline. That's significant considering it covers an entire city block. Improvements in 2019 included replacing building envelopes, putting in new windows, adding in-suite heat recovery ventilation units, and improving controls to help save electricity. In other buildings, retrofits may reduce GHG emissions by more than 50 per cent.



## Adopting a code for altering existing buildings

Improving the performance of existing buildings offers one of the greatest opportunities to reduce GHG emissions in the built environment. While the B.C. Building Code ensures consistency in all new construction, there is no current B.C. or national code specifically addressing existing buildings. This creates a significant barrier for renovations, retrofits and other improvements that bring older buildings up to modern standards.

To fill this gap, the federal government is developing a model code for alterations to existing buildings by 2022. B.C. is among the partners providing input to the federal process.

We're also taking steps to ensure we have our own provincial code for alterations by 2024 to:

- enhance the clarity of technical requirements
- improve energy and seismic performance
- support affordability

We launched Phase 1 of a provincial engagement in fall 2019 with further consultations planned as the work progresses. Provincial codes will harmonize with the federal standards and align with a range of objectives, including energy efficiency, earthquake safety, and occupant health and safety.

## CleanBC Building Innovation Fund (CBBI)

The CBBI Fund provides funding to accelerate the availability, acceptability and affordability of low-carbon building solutions including advanced building designs, new construction methods, and ultra-efficient building components. It's designed to increase the capacity of B.C.-based industries, build consumer confidence and help lower the costs of new technologies and building approaches over time.

In its first intake (May through July 2019) the program drew 49 applications representing \$13.8 million in funding requests. Winners in the 2019-2020 intake will be awarded a total of \$1.8 million, with selected projects distributed across industry and academia, residential and commercial buildings, and urban and rural regions.

## Energy labelling

The Province continues to assess the feasibility of energy labels for homes and buildings, similar to the ratings we see for vehicles and major appliances. In 2019, we focused on gauging stakeholder support for the concept. If there is sufficient interest, we will move forward with formal consultations in the spring of 2020.

In its Energy Efficiency Scorecard (2019), Efficiency Canada highlighted labelling as one of the initiatives B.C. could pursue to build on its progress to date.

### 4.2.3 Supporting communities

#### CleanBC Remote Community Energy Strategy (RCES)

The RCES is a multi-stakeholder effort designed to eliminate, or significantly reduce, diesel consumption in Indigenous and remote communities. RCES targets 22 diesel generating stations across B.C., 12 BC Hydro stations and 10 independently-owned stations supported by Indigenous Services Canada.

RCES aims to reduce diesel generation of electricity province-wide by 80 per cent by 2030 through four pillars of coordinated action: capacity building, energy efficiency, renewable heat, and clean electricity generation.

The program is currently under development with stakeholder engagement planned for spring 2020. Early initiatives include the Renewable Energy for Remote Communities Program, which funds the construction of renewable electricity projects. The program launched in November 2019 with an application deadline of January 17, 2020. The first funded projects will be announced in April 2020.

#### CleanBC Communities Fund (CCF)

CCF is part of the Investing in Canada Infrastructure Program. The provincial and federal governments are investing over \$60 million for the first batch of projects, supporting infrastructure projects for public use that focus on:

- Managing renewable energy
- Accessing clean-energy transportation
- Improving the energy efficiency of buildings
- Generating clean energy

The first round of applications for the Fund closed in March 2019 and drew 52 proposals. Final decisions regarding successful applications will be announced in 2020.

#### HELP FOR FAMILIES

Nearly 50 per cent of B.C. families are now receiving higher climate action tax credits, putting money back in their pockets and helping make life more affordable. As of July 5, 2019, eligible families of four will receive up to \$400 a year, rising to \$500 in July 2021.

The credit offsets B.C.'s carbon tax and helps low- and middle-income families as the province transitions to a cleaner, greener economy.

#### 4.2.4 Public sector leadership

##### Carbon neutral government

Each year since 2010, the B.C. government has achieved carbon neutral operations, maintaining a net impact of zero GHG emissions across the entire provincial public sector including health authorities, school districts, universities, colleges, institutes, Crown corporations and government offices.

In the 2018 reporting year (the most recent available data), our public sector organizations had reduced their GHG emissions 63,619 tonnes since 2010, equivalent to taking more than 22,700 cars off the road for a year.

To achieve carbon neutrality, the Province buys offsets that include emission reductions from investments in nearly every region and sector of the province. For the 2018 reporting year, offsets were sourced from projects involving energy efficiency, fuel switching and carbon sequestration.

##### **ENCOURAGING LOCAL GOVERNMENTS TO BECOME CARBON NEUTRAL**

The Climate Action Revenue Incentive Program (CARIP) provides an annual conditional grant to eligible local governments. CARIP refunds 100 per cent of corporate carbon tax expenditures to local governments that report on their climate action progress through an annual survey.

To be eligible local governments must have signed the B.C. Climate Action Charter. The Charter, established in 2008, is a voluntary agreement between the Province of British Columbia, the Union of B.C. Municipalities (UBCM) and 187 of the province's 190 local governments to:

- Become carbon neutral in their corporate emissions
- Measure and report their community's GHG emissions, and
- Create complete, compact, more energy efficient communities

In the 2018 reporting year, 50 local governments achieved corporate carbon neutrality. Communities of all sizes, in every part of the province, also continue to take action in a variety of sectors including planning, transportation, solid waste, energy generation, water, wastewater and green space.

For more information on the Climate Action Charter go to <https://www2.gov.bc.ca/gov/content/governments/local-governments/climate-action/bc-climate-action-charter>

For more information on the Climate Action Revenue Incentive Program go to <https://www2.gov.bc.ca/gov/content/governments/local-governments/grants-transfers/climate-action-revenue-incentive-program-carip>

## CleanBC Government Buildings Program

In June 2019, the Province committed to reducing emissions from approximately 1,000 courthouses, correctional centres, warehouses and ministry offices around B.C. by:

- switching from fossil fuels to clean and renewable energy sources, such as wind, solar, geothermal, biomass and hydropower
- using smart technologies to conserve energy, such as Wi-Fi building sensors to regulate lighting and real-time data displays
- installing electric vehicle charging stations
- undertaking energy retrofits in existing buildings, such as replacing heating systems and upgrading lighting
- building new energy-efficient facilities, using green design and innovative technologies
- making buildings more resilient to climate change by relocating and reinforcing equipment to protect against possible floods and wind, installing more heating ventilation and air conditioning systems and exterior drainage
- creating flexible and modern work environments to support a growing mobile workforce

Since its inception, the program has supported:

- 25+ building retrofits
- 20 new EV charging stations in government buildings
- 16 projects in eight communities to implement Leading Workplace Strategies, which respond to changing workforce demographics and optimize the use of office space, recognizing, for example, that some employees can work from home, eliminating the need to commute, while others are mobile and may not need a traditional office space to carry out their work.

Over time, the CleanBC Government Buildings program will improve energy efficiency in affected facilities by 80 per cent. This supports our 2030 goal to reduce emissions from public sector buildings by 50 per cent, compared to 2010.

### UNITED NATIONS MOMENTUM FOR CHANGE AWARD

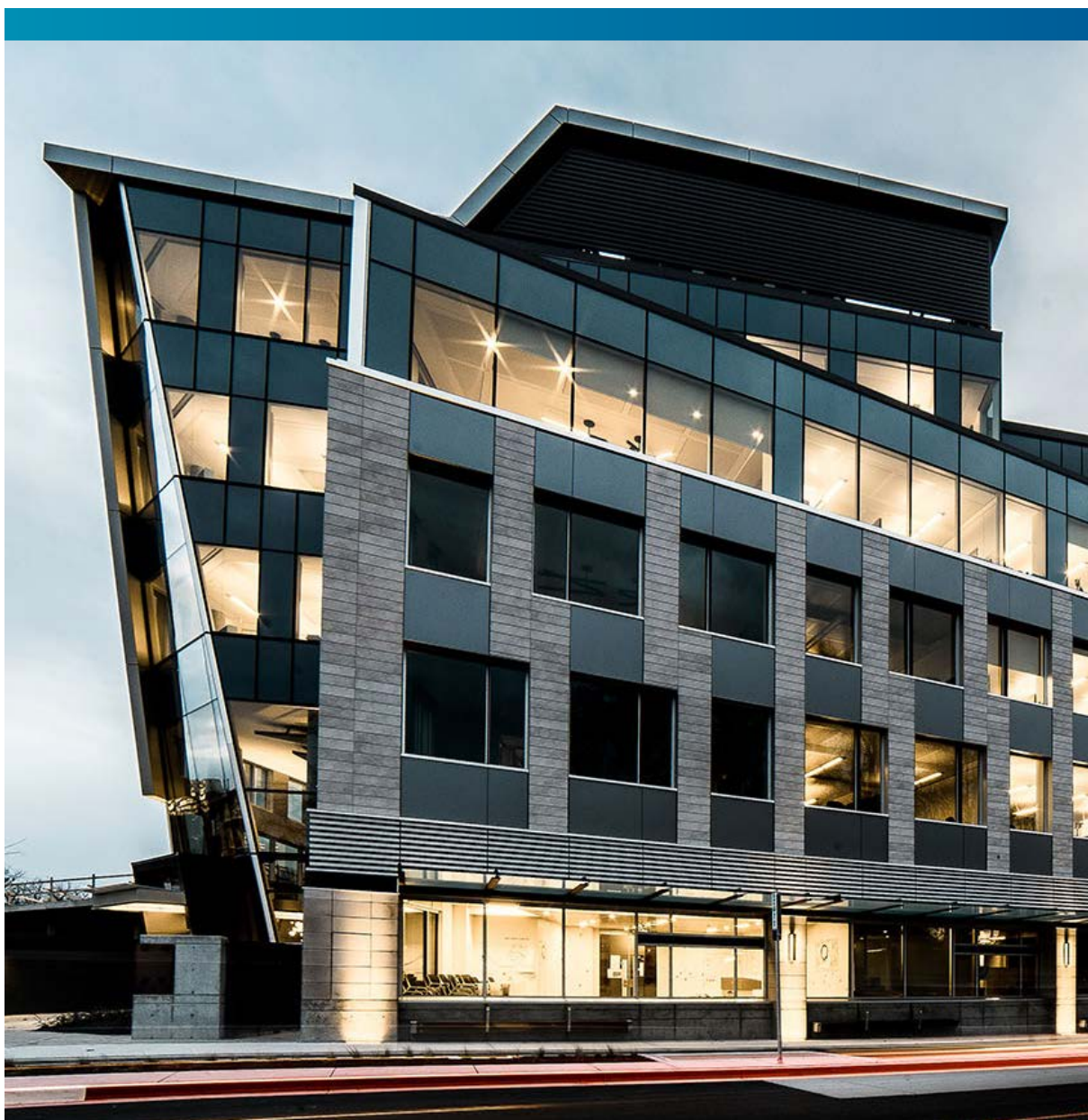
In 2018, B.C. won a “Momentum for Change” Climate Action Award from the United Nations. Our carbon neutral government initiative was one of 15 projects chosen from a pool of more than 560 applications from around the world. The UN said the winners prove that climate action isn’t only possible, it’s innovative, it’s exciting and it makes a difference.

## Public sector vehicle fleet

The Province is developing a five-year plan to reduce emissions from the public sector fleet, including signing onto the West Coast Electric Fleets Pledge with our Pacific Coast Collaborative partners to accelerate the move to cleaner fleets. Early progress on these commitments include the installation of 25 electric vehicle charging stations in government buildings, and government purchase of several hybrid and electric vehicles in 2019 with more on the way in 2020.

## Public sector buildings

B.C.'s public sector organizations (PSOs) are undertaking a range of actions to cut GHG emissions from their operations and to achieve the government's carbon neutral commitment. This includes building new facilities to achieve superior performance in areas such as energy and water efficiency, storm water management and indoor environmental quality. PSOs are also using low-carbon building materials, such as wood, wood products and Portland limestone cement and pursuing other climate-friendly policies, such as installing electric vehicle charging stations for customers and staff.



## 4.3 Reducing waste and turning it into a resource

CleanBC set out a path to reducing GHG emissions from waste by diverting 95 per cent of the province's organic waste from landfills and continuing to capture landfill gases. In CleanBC's first year, we're making progress with a new Organic Infrastructure Program and steps to renew our Bioenergy Strategy. We're also developing a Plastics Action Plan to help keep plastic waste out of our environment.

### Plastics action plan

British Columbians want action on plastic waste and CleanBC is ready to deliver. A public engagement in 2019 attracted tens of thousands of responses with ideas coming from all regions of the province. Public interest was so strong, the Province extended the engagement process so everyone who wanted to could have their say on the new, proposed CleanBC Plastics Action Plan.

The plan discusses action in four connected areas:

- bans on specific types of single-use packaging
- more recycling options for single-use items
- expanding plastic bottle and beverage container returns
- preventing plastic waste in the first place

Reducing plastic waste will help to keep our wildlife and ecosystems healthy, while contributing to the fight against climate change. For example, recycling plastic beverage containers has been shown to reduce GHG emissions by almost 70 per cent compared to producing plastic from virgin resources.

### KEEPING COMMUNITIES HAPPY, HEALTHY AND FULL

Communities across B.C. are showing that small changes can have a big impact on reducing food waste, hunger and carbon pollution.

In Greater Victoria, the Mustard Seed Street Church's Food Rescue Project feeds 35,000 people each month with food that would otherwise go into the waste stream. A \$3 million provincial grant allowed the church to purchase a Food Security Distribution Centre that processes more than a million pounds of perishable food each year. That's 3,000 to 4,000 pounds of food every day being redistributed from local grocers and retailers to 46 schools and community groups.

Food waste, such as leftovers or spoiled food, make up over 25 per cent of the waste discarded from a household. Rotting organic waste releases GHG emissions into the air. While composting food waste is better than sending it to the landfill, preventing food from being wasted altogether is even better. By planning our meals, storing our food properly, and using up leftovers, we can all help make a big difference in our communities.

*Mustard Seed's Food Security Distribution Centre rescues and redistributes 3,000 - 4,000 pounds of perishable food every day.*



## Organic waste

In B.C., organic waste accounts for 40 per cent of the material sent to landfills. As it decomposes, it releases GHGs, so preventing and diverting organic waste is another way to reduce our GHG emissions.

**According to the United Nations Food and Agriculture Organization, if food waste were represented as a country it would be the third largest GHG emitter, behind China and the U.S. We can all help reduce waste by storing our food, so it stays fresh, using up our leftovers and taking a little more care to plan our meals.**

**Since 2007, municipal solid waste disposal per capita has decreased by 28 per cent, suggesting that British Columbians are throwing away less stuff.**

As part of CleanBC, the Organic Infrastructure Program will help communities process more organic waste. Funding through the program will support new infrastructure such as composting facilities and anaerobic digesters, which turns waste into a valuable resource such as nutrient rich compost or an energy source. In May 2019, the Province received 17 applications for funding. Twelve successful projects finalized agreements, with more expected to come on board in the coming months.

B.C. is also working with businesses, communities and families to end food waste. In January 2019, the Province became a founding partner of Love Food Hate Waste Canada, a national program that offers resources to help make food go farther. The Province has partnered with 30 local governments to put the program into action, helping to make the most of the food we buy, reduce waste and produce fewer GHG emissions.

## Renewing the B.C. Bioenergy Strategy

Bioenergy is an integral part of our clean energy landscape and plays a major role in reducing GHGs and meeting our renewable transportation fuel and natural gas targets. CleanBC committed to renewing our bioenergy strategy, creating opportunities to turn organic waste from sectors such as agriculture, forestry and municipal organics into products and energy.

During 2019 we worked with our partners in the B.C. Bioenergy Network and engaged with the public to further explore bioenergy opportunities. We're now developing a Bioenergy Strategy for release in 2020.

Key components of the strategy will include:

- investing in new biocrude refining capacity to meet our production target of 650 million litres of renewable transportation fuels a year by 2030
- helping communities develop and deploy clean technologies
- investing in bioenergy technologies and companies
- expanding production of renewable natural gas
- establishing a Centre of Excellence for Biofuels that leverages the work of the B.C. Bioenergy Network
- identifying and developing viable sources of hydrogen
- working with the forest sector, Indigenous and non-Indigenous communities, and the technology sector to advance the use of forest residuals for advanced building materials, commercial products and renewable fuels. This will be an important part of forest revitalization as we build a new forest bioeconomy in the future.

The strategy will embrace the value of biomass and support the commercial deployment of bioenergy technologies, helping to decarbonize our energy sector and support the transition to a low-carbon economy. Bioenergy projects also offer broader economic opportunities, including for Indigenous and remote B.C. communities.

## 4.4 Cleaner industry

CleanBC builds opportunities for businesses and industries to be world leaders, providing innovative goods and services, and reaping the benefits of greater efficiency and reduced pollution. We've launched the CleanBC Program for Industry to directly reduce emissions at industrial operations, and we're supporting technological innovation, developing solutions for long-haul shipping and trucking, and reducing emissions from natural gas production.

By reducing GHG emissions, CleanBC provides a blueprint for growing our economy. That includes a focus on our export-based industries, such as forestry, energy and mining. Along with creating and sustaining jobs, these important industries are a cornerstone of our province, bringing billions of new dollars into our economy every year, and they're working continuously to make their operations cleaner.

With growing demand for lower-carbon products and solutions, our clean industries can build on this advantage, support growth here at home and help to reduce emissions in B.C. and around the world. At the same time, we need to keep our industries competitive to guard against carbon leakage - the movement of business and investment to places with less stringent environmental policies. This is one of the challenges the Province and industry are working together to address through a new Low Carbon Industrial Strategy.

### 4.4.1 Low-carbon industrial strategy

In November 2018, British Columbia's government and business leaders signed a Memorandum of Understanding (MOU) to establish B.C. as a world leader in delivering low-carbon goods and services to domestic and global markets. The Province and the Business Council of British Columbia are developing a Low Carbon Industrial Strategy that sets out best ways for the parties to collaborate, together and with Indigenous peoples, to boost business investment and build a strong, identifiable low-carbon brand for B.C.

Together, partners collaboratively developed methodologies to assess average GHG intensity per unit of production for specific streams of coal, copper, aluminum, natural gas, LNG, lumber and pulp production. They also developed financial models to generate average production cost structures. These models were then compared against competing jurisdictions identified by both parties.

Initial results show that B.C. products can have a carbon intensity advantage over certain competing jurisdictions—in some cases, B.C. products are 50 per cent less emissions-intensive.

Overall, the financial analysis concluded that the industries modelled are losing ground against their competitors, due to a number of factors including resource quality/availability, transportation distances, market access constraints and tax policy.

The new Low Carbon Industrial Strategy will address these challenges while building on B.C.'s GHG advantage with action in the following areas: innovation, tax policy, regulation, offsets and market mechanisms, infrastructure and marketing.

## MAKING THE MOST OF OUR CLEAN ELECTRICITY

In February 2019, the Province completed Phase 1 of its BC Hydro review, resulting in a new, five-year rates forecast and a new regulatory framework that enhances oversight by the B.C. Utilities Commission.

Phase 2 of the review began in July 2019. Guided by a panel of external experts, it's examining the shifts taking place in B.C. and in continental energy sectors to strategically position BC Hydro and the Province for long-term success. The review is focused on:

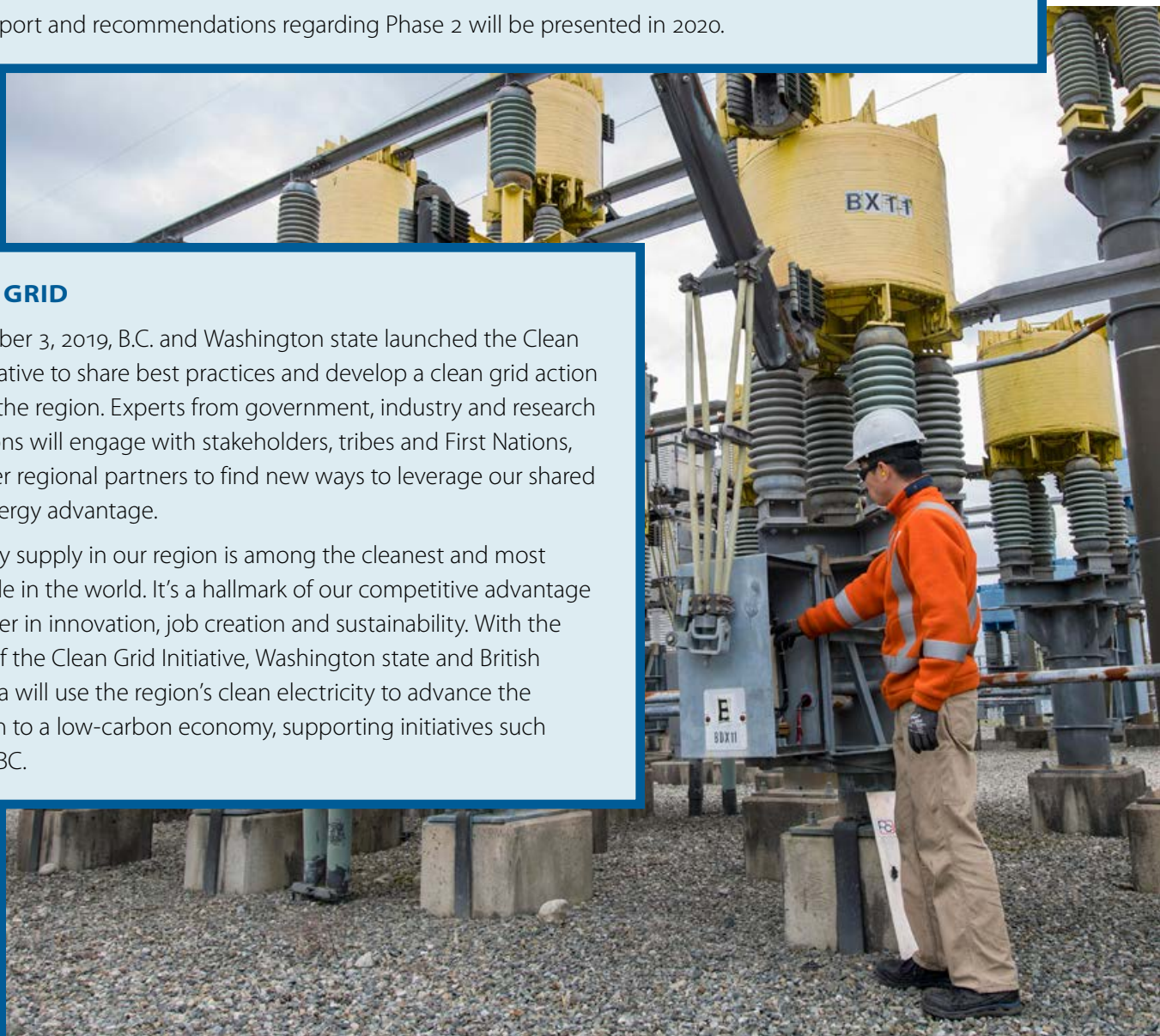
- BC Hydro's role in supporting CleanBC and meeting the Province's legislated 2030, 2040 and 2050 GHG reduction targets
- future opportunities or new roles for Indigenous Peoples and for communities in the energy sector
- integrating new technologies and electricity market trends into BC Hydro's structure, services and assets while keeping rates affordable
- new opportunities for BC Hydro to expand its business in markets outside B.C. to the benefit of ratepayers

A final report and recommendations regarding Phase 2 will be presented in 2020.

## CLEAN GRID

On October 3, 2019, B.C. and Washington state launched the Clean Grid Initiative to share best practices and develop a clean grid action plan for the region. Experts from government, industry and research institutions will engage with stakeholders, tribes and First Nations, and other regional partners to find new ways to leverage our shared clean energy advantage.

Electricity supply in our region is among the cleanest and most affordable in the world. It's a hallmark of our competitive advantage as a leader in innovation, job creation and sustainability. With the launch of the Clean Grid Initiative, Washington state and British Columbia will use the region's clean electricity to advance the transition to a low-carbon economy, supporting initiatives such as CleanBC.



### 4.4.2 CleanBC Program for Industry

As noted in section 4.4.1, British Columbia's important industries have a proven GHG advantage over some competitors. The CleanBC Program for Industry is designed to make them even cleaner. It uses the carbon taxes paid by industry to help industrial operators reduce their emissions.

The program has two components:

- a CleanBC Industrial Incentive that encourages cleaner operations and maintains competitiveness by giving back some carbon tax to lower emitting industrial facilities that meet a world-leading emissions benchmark
- a CleanBC Industry Fund that invests industrial carbon tax revenue directly into emission reduction projects, helping to make our traditional industries cleaner and more competitive

Under the Incentive program, operations that meet a world-leading emissions intensity benchmark will be able to get back 100 per cent of the carbon tax they paid beyond \$30 per tonne of CO<sub>2</sub>e. Operators that don't meet the benchmark will continue to pay a higher rate of carbon tax, creating an incentive to reduce their emissions.

The Incentive Program issued its first call for applications in April 2019 as the Province and industry completed the technical work required to further its development. Details are expected to be announced in early 2020.

The Industry Fund issued its first call for proposals in spring 2019. The Fund received and evaluated 34 proposals, with funding agreements for approved projects finalized at the end of 2019. Approved projects represent a substantial investment in emission reduction projects in pulp and paper, mining, agriculture, oil and gas, and cement sectors, and over the next decade will realize significant GHG reductions.

Both programs are open to eligible operations that report emissions under the *Greenhouse Gas Industrial Reporting and Control Act*, i.e. industrial facilities that emit more than 10,000 tonnes per year. B.C. currently has 131 reporting operations, totalling 654 facilities. These operations accounted for 18.4 Mt of emissions in 2018.



### 4.4.3 Making industrial transportation cleaner

#### Go Electric medium/heavy-duty program for electric vehicles and fuels

With the announcement of CleanBC, the Province committed to support the adoption of medium and heavy-duty electric vehicles and fuels. Since that time, we've been working with our stakeholders to develop a program for launch in 2020. The program will include vehicle rebates and infrastructure investments for electric vans, trucks, buses, port and airport ground equipment, and ferries and other marine vessels.

The new program will build on the progress of the Speciality Use Vehicle Incentive. Since 2017, the Province has provided over 230 rebates for electric vehicles in the commercial vehicle sector, including trucks, buses, port and airport ground equipment. More than a third (90 rebates) have been provided since the launch of CleanBC.

#### Heavy Duty Vehicle Efficiency Program

In October 2019, the B.C. government rolled out a new Heavy-duty Vehicle Efficiency Program to help lower fuel costs and lower GHG emissions in the commercial trucking sector.

Under the program, the Province is partnering with the BC Trucking Association to buy and install fuel-saving equipment in heavy-duty vehicles and share information on driving practices that further reduce GHG emissions.

Heavy-duty vehicles produce approximately 35 per cent of GHG emissions from road transportation in B.C., and fuel is one of the industry's highest-cost inputs. The program is addressing both challenges, putting fuel-saving technologies and practices within reach of more companies.

#### Clean trucking pilot project

The Province continues to work with the Vancouver Fraser Port Authority to reduce emissions from the short-distance hauling of goods between terminals and other facilities. In 2019, four proponents submitted proposals for pilot projects that will make the latest in clean trucks and fuels available for testing. The proposals cover a range of technologies and fuel types, including renewable fuels, hydrogen, and electric.

#### HEAVY DUTY TRUCKS FUELLED BY WASTE HYDROGEN

B.C.'s Hydra Energy is making it easier to cut GHG emissions from commercial trucking. The company retrofits diesel-powered fleets to run on a blend of diesel and hydrogen, reducing emissions by up to 40 per cent, and reducing costs as well.

Its technology works on all heavy-duty diesel trucks. There's no up-front cost for owners and Hydra supplies the hydrogen at a lower cost than diesel.

The company is building a system to capture waste hydrogen from a chemical plant in Prince George and use it to fuel tractor-trailer trucks. Construction is scheduled to start in 2020.



#### 4.4.4 *Making B.C. industries the cleanest in the world*

##### Peace region electricity supply project

Industries and businesses in the Peace Region will soon have access to cleaner energy to power their operations. In May 2019, BC Hydro started construction on two parallel, 230-kilovolt power lines between the future Site C Substation near Fort St. John and the existing Groundbirch Substation, east of Chetwynd. The new lines will meet the need for more electricity to support planned industrial development.

The Peace Region Electricity Supply project will be completed in 2021, building on the success of the Dawson Chetwynd Area Transmission Line (DCAT). Completed in 2016, it connects natural gas industrial operations to the BC Hydro grid, so they can use clean electricity instead of fossil fuels. The DCAT line is now fully subscribed, further supporting the Province's commitment to make our industries the cleanest in the world.

With CleanBC, we're committed to making our natural gas as clean as possible, starting with electrification of upstream production.

##### *Reducing emissions from natural gas production*

##### Electrification Memorandum of Understanding (MOU)

In August 2019, the governments of B.C. and Canada signed a new MOU to affirm their joint commitment to power B.C.'s natural gas sectors with clean electricity. This approach will avoid emissions and position Canada as a supplier of the world's cleanest natural gas. It will also support projects that create new jobs and opportunities in rural and Indigenous communities across the province. In line with the government's approach to liquified natural gas, the projects should:

- Guarantee a fair return for B.C.'s natural resources
- Guarantee jobs and training opportunities for British Columbians
- Respect and make partners of First Nations
- Protect B.C.'s air, land and water, including living up to the Province's climate commitments

##### Reducing methane emissions

As promised in CleanBC, the Province has brought in new regulations to reduce methane emissions in the upstream production of natural gas by 45 per cent by 2025. Developed in collaboration with the natural gas sector, environmental organizations and the federal government, the amendments to the Drilling and Production Regulation will begin to take effect in 2020, with full implementation set for 2023.

The new rules target two key methane sources: fugitive emissions, typically from leaks, and venting, which includes emissions from equipment. The rules encourage the use of new and upgraded technologies, and leak detection and repair programs.

The Province expects to finalize an equivalency agreement with the federal government in 2020 to ensure B.C.'s regulations and oversight remain in force for our natural gas sector.

The BC Oil & Gas Methane Emissions Research Collaborative was created in April 2019 to broaden our understanding of methane reduction and management. Partners in the collaborative include the BC Oil and Gas Commission, the Canadian Association of Petroleum Producers, Geoscience BC and the Pembina Institute. They're studying leading technologies and best practices that can be adapted for use in B.C. by 2023.

## *Reducing the emission intensity of natural gas*

### 15 per cent renewable content

CleanBC committed to making residential and industrial natural gas cleaner by putting in place a minimum requirement of 15 per cent renewable content by 2030. The goal is to reduce its emission intensity and, by extension, its GHG impacts, while supporting jobs and economic growth in sectors such as forestry and agriculture.

Renewable natural gas (RNG) will play a big part in meeting the target, helping our environment while generating new opportunities and revenues for farmers and local governments. They work with FortisBC to capture biogas from decomposing organic matter. That gas is purified to make RNG, which FortisBC injects directly into its system. Participating customers can choose to allocate up to 100 per cent of the natural gas they use in their homes and businesses as RNG.

RNG is also used for transportation fuel and will play an important part in implementing CleanBC. It is carbon neutral, and because it's made from organic material and not fossil fuels, its production captures GHG that would otherwise escape into our atmosphere. Our agriculture, forestry and other sectors can supply the feedstock we need to generate more RNG in the future, opening up new opportunities and revenue streams throughout B.C. as we work to meet our targets in 2030 and beyond.

### **CREATING MORE RENEWABLE GAS**

The Province is partnering with the pulp and paper sector, utilities and academia to accelerate the production of syngas or renewable natural gas made from biomass that would otherwise be burned or sent to a landfill. The syngas can displace natural gas in lime kilns or can be further processed to sell to utilities as a clean gas. The initiative could also enhance the long-term sustainability of B.C.'s forest sector by adding a new product line in B.C. pulp mills.

FortisBC, which provides electricity and natural gas to 1.2 million British Columbians, is working to reduce its customers' emissions by 30 per cent overall by 2030. The 30BY30 Target is among the most ambitious in Canada's utility sector.

#### 4.4.5 Technological innovation, including carbon capture, utilization and storage

Clean technologies and other innovations hold enormous promise for our future. They can help us save money, use less energy, drive cleaner vehicles, produce less waste, and enjoy a cleaner, healthier environment while generating jobs, economic growth and revenues that can be reinvested in British Columbia.

We already have among the strongest clean tech sectors in the country. The 2019 Global Cleantech Top 100 list includes 12 Canadian companies, eight of which are from B.C. Province-wide we have more than 270 clean technology companies employing more than 14,550 people and contributing \$3.7 billion a year to our economy.

The Province supports this vibrant sector through mechanisms such as the Small Business Venture Capital Tax Credit, which encourages equity capital investments in early-stage small businesses. In 2018, the program helped clean tech companies raise over \$15 million in venture capital, providing their investors with \$4.6 million in tax credits. Another initiative, the Innovative Clean Energy (ICE) Fund, has provided more than \$100 million since 2008 to support pre-commercial clean energy projects, clean energy vehicles, research and development, and energy efficiency programs in partnership with B.C. universities, First Nations, local governments and clean tech companies.

B.C. is also home to Canada's Digital Technology Supercluster, and centres of excellence at seven universities and colleges across B.C. bring together experts from the public, private and academic sectors to collaborate on applied research, development and commercialization of new technologies.

Investors and companies around the world look to us for expertise in fields including:

- Hydrogen and fuel cells, particularly for applications beyond transportation, from the smallest mobile devices to telecommunications stations
- Clean transportation, with major international manufacturers developing plug-in electric, fuel cell and natural gas engines
- Energy management and efficiency technologies, such as smart measurement, monitoring and controls that power intelligent energy use
- Renewable energy technology based on the development, testing and use of British Columbia's abundant natural resources
- Water and waste resource management technologies that turn wastewater and solid waste into pristine drinking water, clean energy and valuable, marketable materials

#### Industrial carbon capture, utilization and storage

Industrial carbon capture, utilization and storage technologies have the potential to keep large amounts of GHG emissions out of our atmosphere, storing carbon underground or recycling it to produce other, cleaner forms of energy.

**A recent report by CMC Research Institutes and the Pembina Institute estimates the global carbon capture market could be worth \$800 billion by 2030.**

Since the release of CleanBC, the Province has been working to develop a new regulatory framework for direct-air capture of carbon emissions and to update regulations that provide for safe, effective underground carbon-dioxide storage.

Along with reducing GHG emissions, advancing this technology will offer new economic opportunities for British Columbians.

### CARBON CAPTURE COMPANY BREAKING NEW GROUND

Burnaby-based Svante, Inc (formerly Inventys) is building a \$15 million demonstration plant in Saskatchewan to test its new “adsorption” material, which the company says can capture carbon at half the cost of conventional technology. With support from the Province’s Innovative Clean Energy (ICE) Fund, Svante is also piloting its carbon dioxide capture system at cement producer Lafarge Canada’s plant in Richmond, B.C.

Svante was a four-person operation 10 years ago. It now employs 80 people in its research, development and manufacturing facilities. The company expects to expand even further by 2021 when it moves from demonstration to commercialization.

### Emerging Economy Task Force

B.C.’s economy is influenced by a wide range of factors including global trends, emerging technologies, changing business processes and our responses to climate change. To better understand these dynamics and their impacts on our people and communities, the Province established the Emerging Economy Task Force in July 2018 with the goal of ensuring British Columbians around the province can benefit from advances in innovation and technology.

Chaired by the president of the B.C. Institute of Technology, the task force has 14 members, including B.C.’s Innovation Commissioner. They’ve been examining the B.C. economy, focusing on emerging trends that have the potential to change the nature of business and society in the decades to come.

The task force’s work to date has included engagement, assessment and advice. It will deliver its findings and recommendations to government in 2020.

### Food Security Task Force

With climate change affecting growing conditions and production practices across the province, it’s more important than ever to reconsider how we grow our food and support our farmers and producers. As part of CleanBC, the Province has appointed a three-member Food Security Task Force to examine new ways to use technology and innovation to strengthen our agriculture sector and grow our economy.

The task force will deliver recommendations to government in 2020, providing advice on:

- applying agri-technologies to help farmers and producers enhance productivity, increase economic competitiveness and sustainability, reduce waste and help make sure B.C. farmers are growing the food needed to meet demand
- expanding the emerging agri-technology industry in B.C. as a standalone economic sector to produce technologies that will be in demand globally
- supporting the objectives of CleanBC through the adoption of technologies and practices that will help reduce GHG emissions
- increasing access to fresh, healthy food and supporting local economies

We’ll use this advice to help the sector develop, pilot, commercialize and adopt technologies to ensure the sector remains competitive and resilient, domestically and abroad.

#### 4.4.6 Forest carbon management

The Intergovernmental Panel on Climate Change recognizes that land-based actions, including forest management, are critical to addressing climate change and its impacts. With that in mind, the Province launched the Forest Carbon Initiative (FCI) in 2017, supported by the federal Low Carbon Economy Leadership Fund.

The FCI is investing in a range of activities including fertilization, reforestation, and using forest residues to generate bio-fuels. These investments are advancing B.C. government priorities, such as:

- revitalizing the forest sector
- partnering with Indigenous Nations to help advance reconciliation
- supporting the Province's CleanBC commitments to reduce waste, develop more bio-fuels, generate more hydrogen and make the transition to a low-carbon economy, and
- providing economic benefits for rural communities, helping to make life more affordable for all British Columbians

By 2022, the province will have planted at least 70 million trees through FCI activities, including post-wildfire through the Cariboo and Provincial Reforestation projects. The federal government has also committed to planting two billion trees over the next 10 years. For more on the FCI and a link to the FCI Project Portal, go to <https://www2.gov.bc.ca/gov/content?id=3919ABD1BBC747069352CE0C5F84A37F>.

#### 4.4.7 Hydrogen economy

Hydrogen will be a critical part of our clean, low-carbon energy future. We have the raw materials, including clean electricity, and hydrogen has the advantage of being carbon free at the point of use. As hydrogen supply continues to grow, it can be:

- used directly in fuel cells to power electric vehicles, stationary power systems, and off-road industrial vehicles
- used as a replacement for diesel in remote and rural communities that aren't connected to the power grid, and
- blended with natural gas to create a cleaner burning fuel and increase the renewable content delivered through our extensive natural gas infrastructure

In addition to reducing GHGs, all of these applications have the potential to generate jobs, growth and opportunities in every part of British Columbia.

In February 2019, the Ministry of Energy, Mines and Petroleum Resources, in partnership with the BC Bioenergy Network and FortisBC, commissioned the [British Columbia Hydrogen Study](#) to assess how this emerging industry can benefit our environment and our economy. The study included stakeholder interviews and workshops attended by industry, utilities, academics, various levels of government and non-government organizations.

Completed in June 2019, the study concluded that large-scale deployment of hydrogen in B.C. can close the gap in current plans to balance emissions reductions with optimal use of our natural resources. That includes:

- decarbonizing key sectors of the economy such as heating and cooling, long-range transportation applications, and energy intensive industries
- economic growth and job creation through the development of B.C.'s hydrogen supply chain and infrastructure, and supply to emerging export markets
- leveraging B.C.'s natural resources and infrastructure to meet our emissions reductions goals



## 5 HELPING PEOPLE GET THE SKILLS THEY NEED

---

**Building a cleaner future means new opportunities for everyone. Whether it is to produce clean energy, renovate buildings or design new technologies, a cleaner future will help create good jobs, and support generations to come.**

### Developing a CleanBC Job Readiness Plan

Government is developing a CleanBC Job Readiness Plan to help people seize opportunities as we move towards a cleaner economy. This plan will identify opportunities across the province for workers, industry, and businesses.

Public and stakeholder engagement on this work began in November 2019 to help identify:

- which occupations and skills will be needed in the future
- where new jobs are likely to be
- how mid-career workers can develop new skills

We've reached out to people across the province—from rural and remote communities to urban centres. We've spoken with industry leaders, training professionals, workers, high school students, and community members.

The opportunities around clean jobs are diverse in B.C. and will continue to grow—encompassing sectors like clean buildings and construction, energy efficiency, transportation, waste management, sustainable tourism, sustainability education, and urban planning.

People are interested in the new job opportunities that come with building a cleaner province, but they want to make sure that training opportunities are accessible and appropriate for people at different ages and stages of their careers. Partnering together—as educators, employers, workers, and communities—will be critical to strengthening these opportunities and planning for the future.

Our job readiness plan will respond to feedback from stakeholders, assessments of labour market conditions and economic trends in a low-carbon economy—providing a framework for sector-specific actions and guiding investments in skills training. Consultations will continue into 2020.

### Building skills for a cleaner future

With more people choosing cleaner vehicles, we expect to see more jobs in B.C.'s EV sector. We committed \$6 million in *Budget 2019* to support training programs for automotive technicians and electricians, and to advance research and commercialization in the electric vehicle sector.

The B.C. Institute of Technology (BCIT) hosted two pilot training sessions for EV mechanics in the fall of 2019. The City of Vancouver had 12 mechanics take part, building their skills and providing feedback to help fine-tune the training program.

The newly developed EV Maintenance Training Program at BCIT will make sure the province's workforce has the skills and training needed to support more EVs on the road, and will be publicly available in 2020.

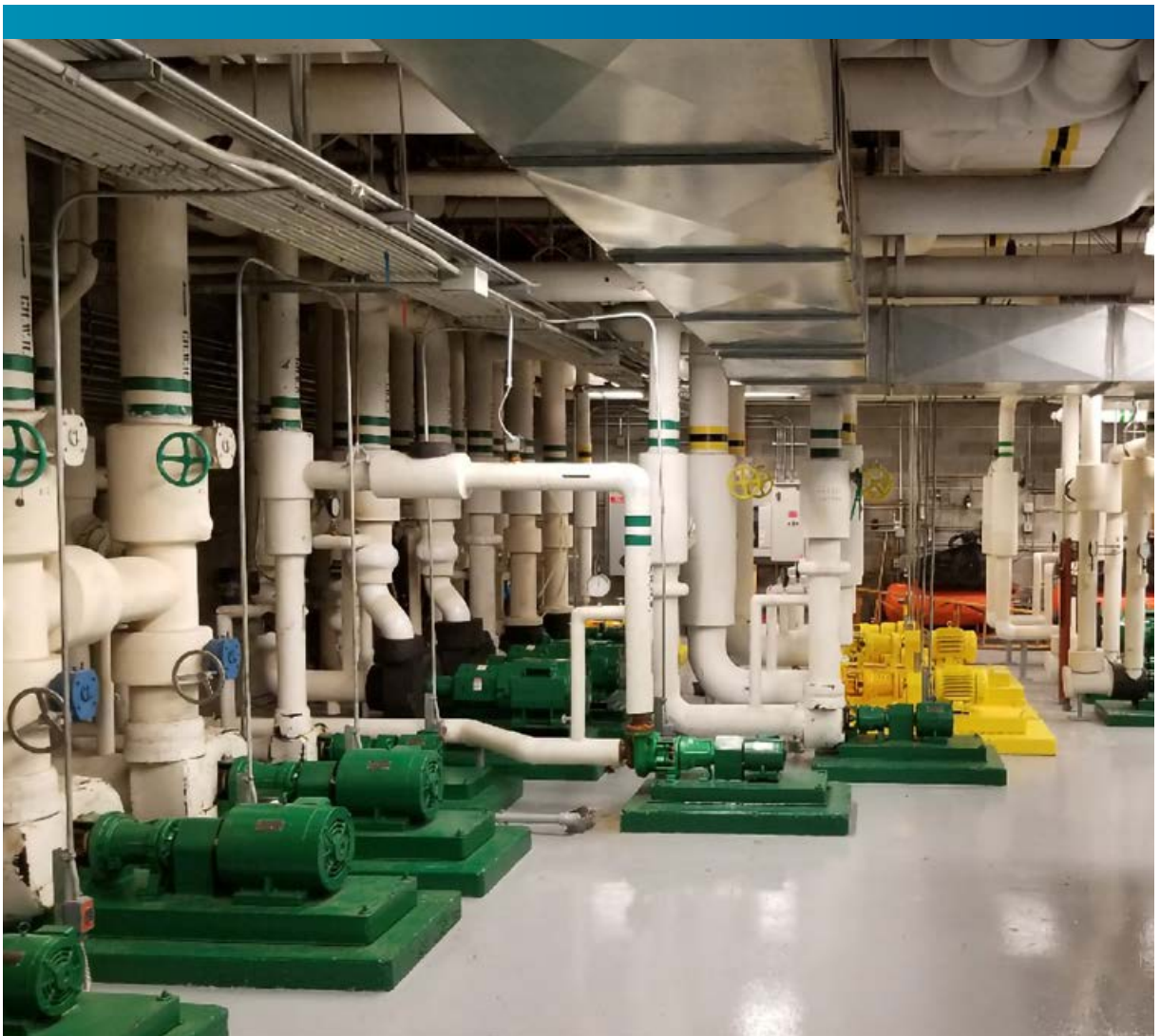
### SUSTAINABLE ENERGY ENGINEERING

Sustainable energy engineering, a program unique to Western Canada, has a new, state-of-the-art facility at Simon Fraser University's (SFU) Surrey campus.

The new 20,458 square-metre facility serves as an innovation hub, creating better access for prospective tech students throughout the Lower Mainland. It accommodates 440 new full-time equivalent (FTE) student spaces and 40 faculty and staff.

Sustainable energy engineering integrates science, environmental and business courses, preparing students to work in clean technology sectors, such as smart cities, clean power generation and sustainable food and water solutions.

The five-storey, LEED-gold-certified building is adjacent to the current SFU campus at Surrey's Central City Mall complex. It features modern teaching labs, classrooms, study spaces, offices, a large light-filled central atrium space and a 400-seat lecture hall to serve SFU as well as the broader Surrey community.



## 6 PREPARING FOR A CHANGING CLIMATE

---

**By planning and taking action now, we can take care of our homes, businesses and communities and build a future where everyone has the support they need to adapt to a changing climate. We can develop effective responses that are integrated into planning at all levels of government, making them less expensive and more effective.**

Climate change is already impacting our communities and our environment. While all of B.C. will have warmer temperatures, each region will face different impacts. For example, while winter rainfall is expected to increase throughout the province, some places such as southern Vancouver Island will likely see less rain in the summer while others, such as the north-east region, will see more precipitation across all seasons. Consistent throughout all regions in B.C. is that Indigenous communities are being disproportionately affected by climate change and extreme weather.

Generally, we're expecting to see:

- Warmer temperatures in all seasons
- More intense and more frequent heavy-rain events
- Changes in growing seasons for crops and gardens
- Increased drought and water shortages
- Larger and more frequent wildfires
- Changes in streamflow patterns and lake levels
- Stronger storm surges
- Rising sea levels
- Changing forest conditions
- Changes in plant and animal distributions
- Smaller snowpack and loss of glaciers
- Lower pH in our oceans which affects shellfish (ocean acidification)

To better understand and prepare for these changes, the Province released a Preliminary Strategic Climate Risk Assessment and is developing a climate preparedness and adaptation strategy. Both are direct responses to the 2018 B.C. Auditor General's Report, [Managing Climate Change Risk: An Independent Audit](#).

## 6.1 Strategic climate risk assessment

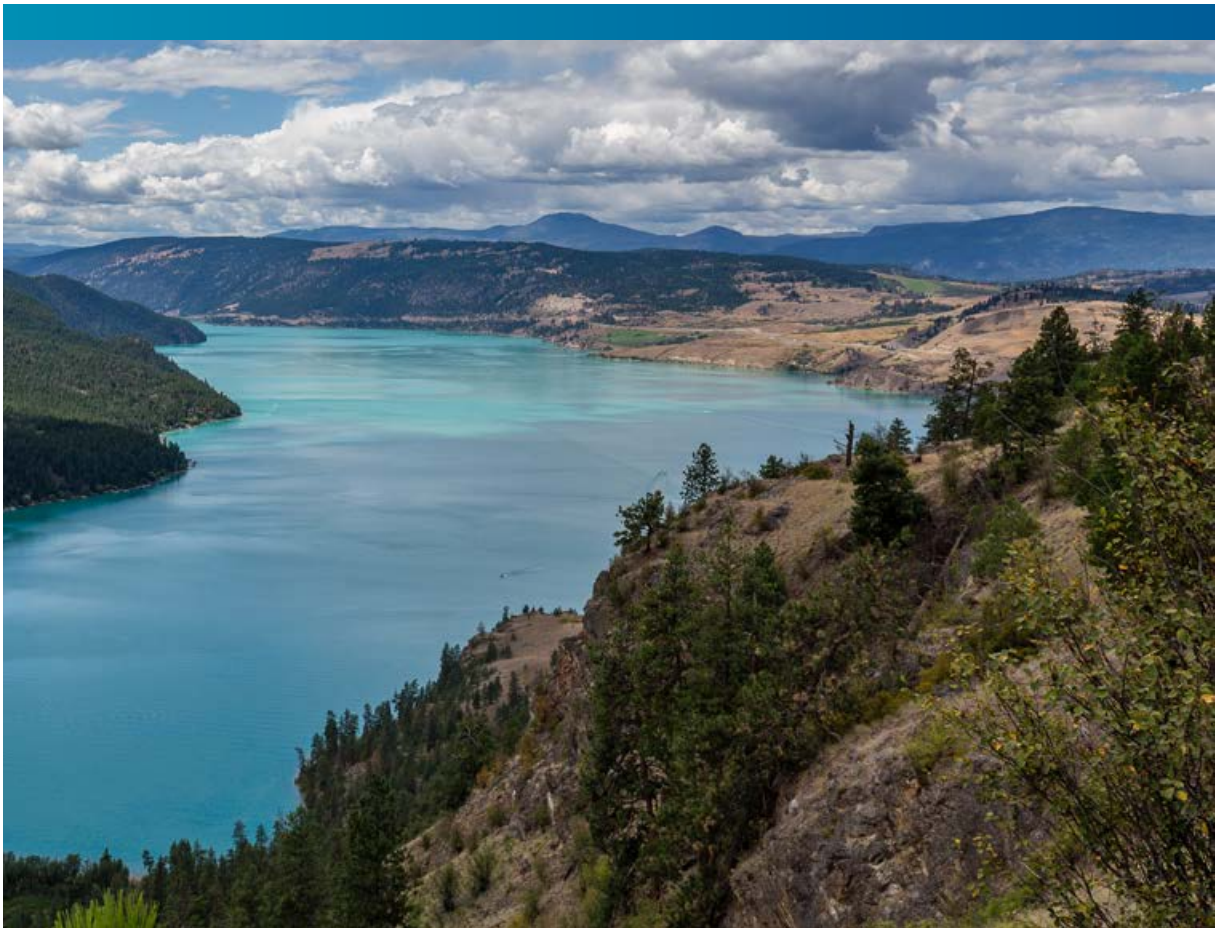
As a first step in better understanding climate risks and how we can address them, the Province released a [Preliminary Strategic Climate Risk Assessment](#) in July 2019.

The assessment examines 15 significant climate risk events for B.C. and evaluates the likelihood of each one occurring, now and in the 2050s. It also evaluates the consequences of each event across eight areas covering health, social, economic and environmental impacts.

This initial assessment concluded that the greatest risks to B.C. are: severe wildfire, seasonal water shortage, heat wave, ocean acidification, glacier loss, and long-term water shortage. Other risks, such as severe river flooding and severe coastal storm surge, have a lower likelihood but would have major consequences for infrastructure, public health, the environment and the economy.

The second phase of the risk assessment, which began in the fall of 2019, includes working to understand Indigenous perspectives on climate change and identify approaches that support Indigenous communities who are playing an important role in adapting to a changing climate. The Province will also customize and pilot the risk assessment's methodology for use in ministry and regional level climate risk assessments. This work will support ministries and other organizations in understanding, prioritizing, and responding to emerging climate risks.

As we move forward, we will continue to assess the risks we face, factoring in new information as it becomes available. Under the *Climate Change Accountability Act*, the provincial risk assessment will be updated every five years.



## 6.2 Climate preparedness and adaptation strategy

As promised in CleanBC, the Province is developing a climate preparedness and adaptation strategy in collaboration with Indigenous peoples and informed by the Preliminary Strategic Climate Risk Assessment. Public consultations began in spring 2019 with 10 regional Indigenous engagement sessions. Local government, public, stakeholder and further Indigenous engagement began in fall 2019 and will continue until the release of the strategy in late 2020.

The provincial climate preparedness and adaptation strategy will build on a strong foundation of actions already underway to manage climate change risks, including work in the following areas.

### Preparing for wildfires

In May 2019, the Province added \$36 million to the Community Emergency Preparedness Fund, which supports local governments and Indigenous communities to reduce their wildfire and flood risk and effectively respond to emergencies when they happen.

We've also invested in wildfire prevention and preparedness—with \$235 million going to the Forest Enhancement Society of B.C. for wildfire risk reduction, reforestation, forest rehabilitation, and other efforts. The Community Resiliency Investment Program provides \$60 million to help local governments and First Nations lessen wildfire threats around their communities.

Since the release of CleanBC, the Ministry of Agriculture has delivered farm and ranch wildfire preparedness workshops in 10 communities, while the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) has continued to fine-tune forest management practices to help reduce the potential for wildfires. The Province has also developed a Wildfire Preparedness Guide for individuals, families and businesses, providing advice on what to do before, during and after a wildfire.

Through these programs and others aimed at addressing and reducing wildfire risk, we're building more resilient communities. We will continue to meet with leaders from local governments and Indigenous communities to hear about their unique challenges and learn how we can better respond to wildfires and other climate caused weather disruptions.

Additionally, the Province is developing an emergency management cluster initiative aimed at improving governments' capabilities for hazard prevention, mitigation, response and recovery, with an early focus on wildfire prediction. The initiative is focusing on developing innovative solutions, such as new applications of geospatial data and machine learning, to solve challenges while growing partnerships among various levels of government, Indigenous peoples, academia and industry.

### Preparing for flooding

Along with providing additional funding through the Community Emergency Preparedness Fund, the Province has developed guidance for local governments and professionals on incorporating sea level rise into sea dike design and coastal development to protect people, buildings, and infrastructure from flooding. Work is also underway to better understand how climate change will affect flood risk in B.C. and how the Province can work with other levels of government to effectively manage those risks. The Province updated the B.C. Flood Response Plan in 2018, and is developing a B.C. Flood Risk Strategy, as well as a modernized *Emergency Program Act*.

## Preparing for water shortages

B.C.'s *Water Sustainability Act* contains new tools that can be used to manage water through shortages and plan for future changes in water resources, including changes in supply and demand that are caused by climate change. More work is underway to better understand how the Province's approach to managing water shortages can be enhanced to address more frequent droughts.

## Protecting our infrastructure

Risks to our transportation infrastructure are being addressed on a number of fronts, including climate change risk assessments of highway segments throughout B.C. The Province has also:

- collaborated with Engineers and Geoscientists B.C. to produce guidance on including climate change considerations in engineering design work
- collaborated with the Pacific Climate Impacts Consortium at the University of Victoria to create "Climate Explorer," an online tool providing future climate projections for any location in the province. This information will help planners and builders understand the threats our infrastructure may face in the future.

In December 2019, the Province completed a pilot project to test a software tool (XDI Platform) that assesses the vulnerability of infrastructure in a changing climate and considers cross-dependencies.

The pilot focused on Nanaimo Regional General Hospital and its surrounding infrastructure to help identify climate vulnerabilities. A second pilot is planned to apply the software to a broader range of public sector buildings and infrastructure in select areas of Metro Vancouver.

## Ensuring future food supplies

Ministry of Agriculture and partners in the BC Agriculture & Food Climate Action Initiative are working with producers across the province to understand climate change impacts on agriculture and prepare the sector for the future. Since the release of CleanBC they've:

- completed Regional Adaptation Strategies for two regions: Kootenay & Boundary, and Bulkley-Nechako & Fraser-Fort George
- initiated a Regional Adaptation Strategy for Vancouver Island
- launched 10 multi-year applied research projects to advance climate change adaptation on B.C. farms and ranches

The Province has also established a task force to examine new ways to use technology and innovation to strengthen our agriculture sector and grow our economy.

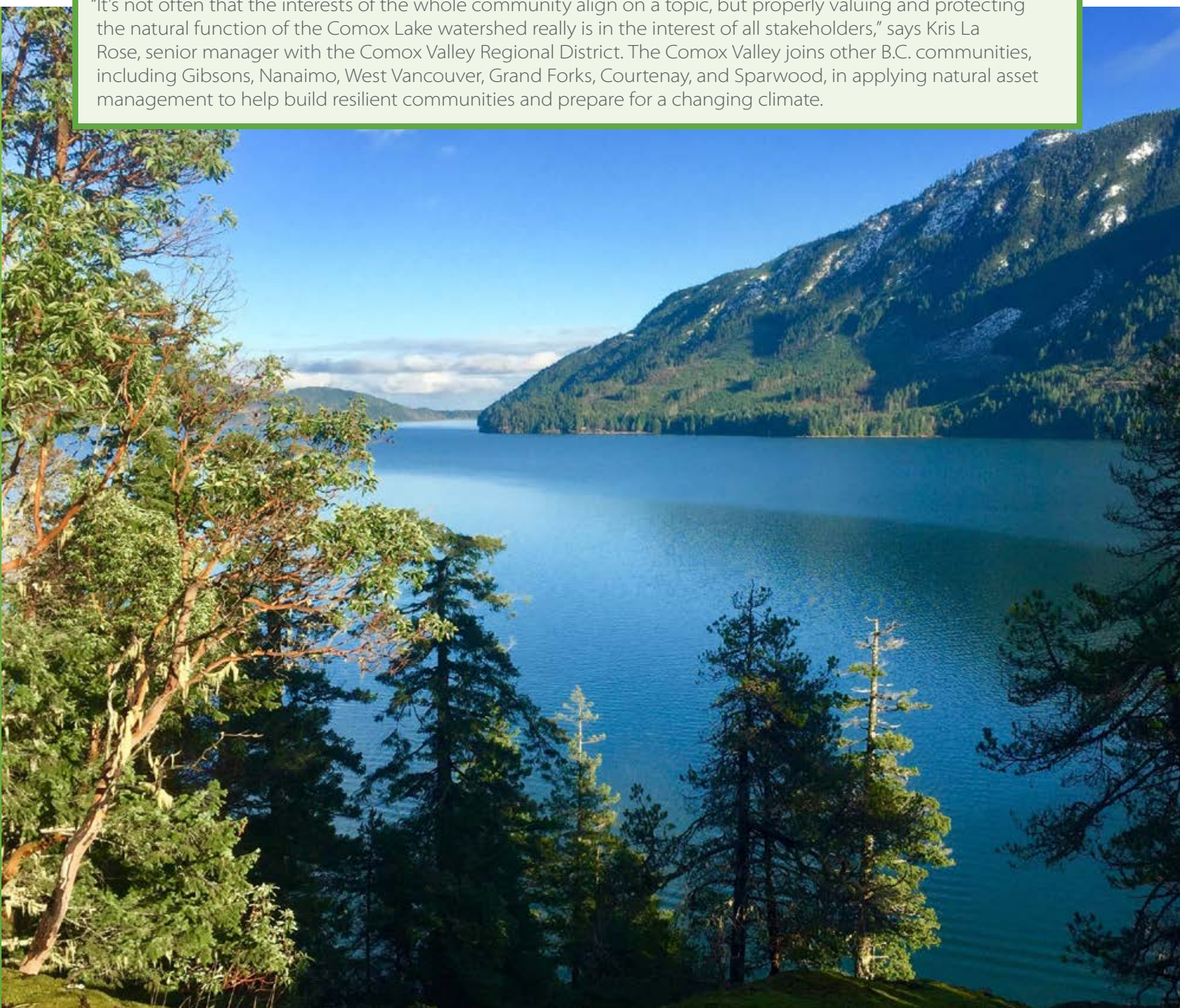
The Climate Preparedness and Adaptation Strategy will build on all of these activities and provide a central focus as our work moves forward.

### **BUILDING A RESILIENT COMOX VALLEY WITH NATURAL ASSET MANAGEMENT**

Climate change in the Comox Valley is expected to result in more intense rainfall in the winter and more frequent, longer droughts in the summer. A new project is focused on maintaining safe, reliable drinking water and other values thanks to a partnership between the Municipal Natural Assets Initiative, a not-for-profit, and the Kómoks First Nation, Comox Valley Regional District, City of Courtenay, Town of Comox and the Village of Cumberland.

This is Canada's first natural asset management initiative at the watershed level, helping communities to manage risks by better understanding the role of natural assets, like forests and wetlands, in providing vital services and including them in core asset management and financial processes. Natural asset management recognizes, for example, that wetlands protect communities from floods, that forested watersheds help maintain clean drinking water, and that green spaces moderate temperature and filter air—often for less money than engineered alternatives and with a range of other benefits.

"It's not often that the interests of the whole community align on a topic, but properly valuing and protecting the natural function of the Comox Lake watershed really is in the interest of all stakeholders," says Kris La Rose, senior manager with the Comox Valley Regional District. The Comox Valley joins other B.C. communities, including Gibsons, Nanaimo, West Vancouver, Grand Forks, Courtenay, and Sparwood, in applying natural asset management to help build resilient communities and prepare for a changing climate.



## 7 WORKING TOGETHER

---

**CleanBC is designed to benefit all British Columbians, so public engagement continues to be a priority. The plan itself reflects the ideas and advice we heard throughout 2018 when we first proposed a series of actions to reduce carbon pollution, use clean energy to power our economy, and create opportunities across the province.**

Since the release of CleanBC, we've held a series of Telephone Townhalls with more than 12,700 participants, giving people an opportunity to speak directly with the Minister of Environment and Climate Change Strategy. We've engaged directly on issues like reducing plastics, active transportation, CleanBC job readiness, and preparing for a changing climate. We've also been working closely with individuals and organizations, as described below.

### 7.1 Partnering with Indigenous peoples

In November 2019, B.C. made history by passing the *Declaration on the Rights of Indigenous Peoples Act*, which creates a legislative framework for the Province's work toward reconciliation. Developed in collaboration with the First Nations Leadership Council, the legislation supports partnership and collaboration with Indigenous peoples, ensuring Indigenous rights are respected and building a stronger, more inclusive and more just B.C. that will create a better future for everyone. Working together for a cleaner future provides an opportunity to advance lasting reconciliation and support the self-determination of Indigenous peoples.

#### 7.1.1 Engaging with Indigenous peoples

Since the launch of CleanBC, we've been working closely with Indigenous peoples to build stronger partnerships to implement initiatives that include developing clean energy infrastructure in remote communities, supporting community resiliency, participating in new clean economy opportunities, recognizing traditional knowledge, and working with communities to adapt to the impacts of climate change.

The Province hosted 10 regional engagement sessions across the province to talk about collective actions to reduce emissions and prepare for a changing climate. The sessions were attended by people representing 90 Indigenous communities and organizations.

The Province also participated in the Indigenous Clean Economy Conference, held a two-day session at the 43<sup>rd</sup> Annual B.C. Elders Gathering, presented at the Métis Nation B.C.'s Annual Youth Forum and continued to meet with the First Nations Leadership Council, various Indigenous organizations, and individual First Nations. These discussions focused on CleanBC's policies and programs related to transportation, buildings, clean energy opportunities and preparing for a changing climate, as well as the development of the climate preparedness and adaptation strategy. In addition, the Ministry of Advanced Education and Skills Training held a series of workshops across B.C. to gather advice from Indigenous organizations and individuals with expertise on employment and labour readiness training.

The First Nations Leadership Council is partnering with ministries in a Technical Working Group on Climate Change. The working group's role is to engage in dialogue, exchange information and develop recommendations on climate change laws and regulations, clean energy policies, programs and relevant actions undertaken by the Province and First Nations.

Indigenous peoples are also closely involved in adaptation plans. An Indigenous Climate Adaptation Technical Working Group is making sure Indigenous expertise and advice are incorporated into B.C.'s climate preparedness and adaptation strategy. The Province also continues to fund, in collaboration with Natural Resources Canada, climate preparedness workshops with Indigenous communities through the BC Regional Adaptation Collaborative.

### **7.1.2 Supporting Indigenous climate leadership**

With CleanBC, the Province is working with Indigenous peoples to incorporate Indigenous knowledge and support Indigenous climate leadership.

#### **7.1.2.1 First Nations Clean Energy Business Fund (FNCEBF)**

FNCEBF supports First Nations' participation in the clean energy sector. The Province invested close to \$1 million from the fund in 2019, helping 14 First Nations pursue clean-energy projects. Examples include:

- upgraded heating systems on the Halalt First Nation
- a hybrid solar smart grid for the Kwikwasut'inuxw Haxwa'mis First Nation
- a solar and wind power microgrid for the Tlatlasikwala First Nation
- heat-pump systems in the Mowachaht Muchalaht First Nation's administration and recreation buildings
- community energy plans for the Cheam, Kwakiutl, Kitsumkalum, Sumas and Fort Nelson First Nations, and the Bonaparte Indian Band
- clean-energy feasibility studies for the Kwikwetlem, Saulteau, Tl'esqox and Xeni Gwet'in First Nations

Applications for the next FNCEBF intake closed at the end of January 2020. Since 2011, more than 110 First Nations communities have benefited from more than \$11.2 million in capacity and equity funding.

#### **7.1.2.2 Renewable Energy for Remote Communities Program (RERC)**

The Renewable Energy for Remote Communities Program (RERC) will support First Nation communities in remote parts of the province to switch from diesel to clean energy. The program has earmarked \$16.5 million over three years for renewable energy projects, complementing other initiatives that focus on energy planning, energy efficiency and decarbonizing energy systems. RERC is part of the CleanBC Remote Community Energy Strategy.

#### **7.1.2.3 BC Indigenous Clean Energy Initiative (BCICEI)**

The BC Indigenous Clean Energy Initiative supports the early development of community-scale clean energy projects and energy-efficiency measures in Indigenous communities. CleanBC contributed \$5 million in 2019, supporting three rounds of project funding. The first intake received 50 applications from across the province, and 13 projects were funded.

## BC INDIGENOUS CLEAN ENERGY INITIATIVE

The BC Indigenous Clean Energy Initiative (BCICEI) provides support to develop Indigenous communities' capacity and readiness to advance local or regional clean energy projects. Over three years (2019-2022) the BCICEI will receive \$5 million from the Province and \$4.5 million from Western Economic Diversification Canada. Renewed funding and support will build on past success by enabling more Indigenous communities to engage in early stage development of local clean energy projects.

Through recommendations from its advisory committee, the BCICEI has invested over \$6 million in 43 projects, including 14 in remote, off-grid, or diesel-dependent communities. These investments have gone towards hydro, solar, geothermal, bioenergy, and innovative demand-side management projects across British Columbia.

Overview of the 2019-2020 Funding Intake:

- 50 proposals representing \$10.75 million in combined funding requests
- 19 applications received in the most recent funding intake were from communities identifying as remote, off-grid, or diesel-dependent
- Projects ranged in size from 17.8kW to 30MW
- Proposed projects captured clean energy projects from early feasibility stages to pre-construction activities
- 13 projects funded for a total of \$2.5 million

The funding intake for 2020-2021 closed on January 31, 2020.

### PROJECT IN DETAIL: TŠILHQOT'IN NATIONAL GOVERNMENT SOLAR FARM

#### Tšilhqot'in Solar Farm Shines Bright

The territories of the Tšilhqot'in Nation are rich with sun, wind and water, making it the perfect location to bring clean energy to surrounding communities. Located on a two-hectare site, 80 kilometres west of Williams Lake, B.C., the Tšilhqot'in Nation installed 3,456 solar panels that will provide 1,500 megawatt hours per year of power through the BC Hydro grid. That's enough electricity to power roughly 135 homes. Owned and operated by the Tšilhqot'in, it's among the largest solar farms in B.C.

The BC Indigenous Clean Energy Initiative is investing in this and other clean energy ventures. The First Nations Clean Energy Business Fund also provided \$300,000 in equity investment in the project in 2018.

*Owned and operated by the Tšilhqot'in Nation, the solar farm is among the largest in B.C.*



#### **7.1.2.4 Community Energy Leadership Program (CELP)**

The Community Energy Leadership Program supports First Nations and local government investments in energy efficiency and clean energy projects. The program aims to reduce GHG emissions, increase energy efficiency, stimulate economic activity in the clean energy sector and support vibrant and resilient communities. \$650,000 was dedicated to the 2019 funding intake.

## **7.2 Partnering with business and industry**

### **7.2.1 Small business**

Through the Small Business Roundtable, the Province has engaged with small and medium-sized enterprises on CleanBC programs, policies and resources. The Roundtable is an advisory board of small business leaders from across B.C. who collectively represent the diverse interests of all regions and sectors. Engagement is typically done through quarterly meetings, community consultations and feedback received through the Roundtable's website.

Working with small business leaders we highlighted available programs, incentives and training opportunities. These include the BC Tech Co-op Grant, which provides up to \$10,800 for hiring new co-ops to work in clean tech, and the B.C. Employer Training Grant, which provides up to \$300,000 a year to offset the costs of skills training.

The Province also held several meetings with the Catalyst Business Coalition, formerly known as the Business Coalition for a Clean Economy. The group formed in 2018 with three goals: to inform British Columbians how clean energy policy is good for businesses, to celebrate climate action, and to hold government to account when B.C. lags behind. Meetings in August and October 2019 included specific information on supporting small and medium-sized businesses in their efforts to reduce carbon pollution, prepare for the low-carbon future, and invest in clean solutions under CleanBC.

In future years, there is an opportunity to work with partners such as the tourism sector to reduce GHG emissions, foster responsible visitor travel and refine sustainable performance indicators for the tourism industry.

### **7.2.2 Industry**

Throughout 2019, the Province worked in partnership with the Business Council of British Columbia to develop a strategy positioning B.C. as a world leader in delivering low-carbon goods and services. The first stage of work involved intensive research and analysis to validate B.C.'s GHG advantage in key industries, including forestry, energy and mining, and to assess how competitive our industries are with other jurisdictions.

Guided by a 2018 Memorandum of Understanding, the work towards a Low Carbon Industrial Strategy spanned months and involved more than 40 subject matter experts. The degree of effort and collaboration between industry and government was unprecedented in B.C.

## 7.3 Partnering with local governments

The Union of B.C. Municipalities (UBCM) has struck a Special Committee on Climate Action to generate new ideas, explore opportunities and barriers to local government action, and identify avenues for further partnership work in mitigating, and adapting to, the effects of climate change. The committee, whose members include the Ministry of Municipal Affairs and Housing, seeks partnerships and alignment to further lower emissions and create new economic opportunities across the province.

Additional engagement with municipal leaders has involved a number of events, including interactive workshops on CleanBC and the provincial climate preparedness strategy.

## 7.4 Engaging with youth

Young people are understandably concerned about their future and engaging with them will be a priority for CleanBC going forward.

We witnessed their dedication to the cause in September 2019, when young people around the world took to the streets in unprecedented numbers to demand action on climate change.

In November 2019, the Province partnered with the Pacific Institute for Climate Solutions to convene youth and young leaders interested in climate change, learn about their perspectives and work, and further identify how they can get involved with CleanBC. The event included a youth-led panel and open table discussions on youth activism, decarbonization, adaptation, intersectionality, intergenerational knowledge transfer, climate policy and the circular economy.

Organizations such as the Climate Initiative and Sustainabiliteens Vancouver are also making a difference. Engaging with them and youth in general will help ensure their interests and ideas are incorporated into CleanBC programs and initiatives, including the development of B.C.'s climate preparedness and adaptation strategy.

### Métis youth

The Province was invited to present CleanBC at the Métis Nation B.C.'s Annual Métis Youth Forum in August 2019. The two-hour workshop was attended by 40 Métis youth from across B.C. It encouraged them to consider how B.C.'s climate is changing and what actions can be taken to prepare for these changes—including where homes are built, and which crops are grown. The workshop also examined where B.C.'s climate emissions come from and how CleanBC is working to reduce them. Youth provided feedback on CleanBC and brainstormed ideas for further emission reductions and adaptation actions in their communities.

## 7.5 Engaging with British Columbians

### ClimateReadyBC

On November 7, 2019, the Province launched ClimateReadyBC: Preparing Together, an online public engagement to help develop a new climate preparedness and adaptation strategy. The site provides information on B.C.'s changing climate, with a survey and discussion forum for individuals and organizations to share their experiences and their vision for a climate ready future. This input will be used to help the Province develop a policy discussion paper for release in spring 2020, which will inform the climate preparedness and adaptation strategy to be released later in the year.

Additional engagement with Indigenous communities and organizations, local governments and stakeholders will continue through winter 2019/2020.

### CleanBC job readiness

Public and stakeholder engagement on a CleanBC Job Readiness plan began in November 2019, recognizing that, as the clean economy grows, people will need new skills to fill emerging jobs and professions. We hosted an online forum, held community meetings across the province, and reached out to business, workers, educators, and Indigenous communities. The Province invited people's perspectives on topics ranging from "What's a green job?" to "How can we drive business growth with CleanBC."

### Zero-Emission vehicle legislation

The Province has conducted two engagements with auto sector stakeholders to help shape the new *Zero-Emission Vehicle Act* and regulations. The first session was held in the spring with the second in the fall of 2019.

### Active transportation

In March 2019, the Province opened a public engagement on active transportation. The process included eight regional forums, meetings with local governments and an online engagement process that garnered over 1,800 comments from British Columbians. People offered lots of good ideas for improving active transportation links between neighbourhoods, transit facilities and town centres.

Feedback from the engagement was incorporated into B.C.'s first active transportation strategy, "Move. Connect. Commute." which was launched in June 2019.

### Plastics action plan

During the summer of 2019, a public engagement on plastic pollution attracted so much interest that the Province extended it so everyone who wanted to was able to participate. More than 29,000 people completed online feedback forms and the consultation website recorded more than 40,000 visits. The information gathered will help us finalize a B.C. Plastics Action Plan.

### Telephone town halls

In March 2019, the Minister of Environment and Climate Change Strategy took questions directly from British Columbians in four telephone townhalls, two on the Lower Mainland, one on Vancouver Island and one in the North and Interior regions. Nearly 13,000 people participated, staying on the calls for an average of 21 minutes.

## APPENDIX A

### 1. List of indicators that are currently quantified

CATEGORY	INDICATOR	MEASURE	HISTORICAL <sup>12</sup>	MOST RECENT	% CHANGE	PERIOD
Economic Transition	GHG intensity of the economy	Tonnes of CO <sub>2</sub> e per million dollars of GDP	309	250	-19%	2007 – 2017
	GHG emissions per person	Tonnes of CO <sub>2</sub> e per British Columbian	15.1	13.1	-13%	2007 – 2017
	Provincial GHG emissions (gross)	Million tonnes of CO <sub>2</sub> e	63.7	64.5	+1.2%	2016 – 2017
Transportation	Electric vehicle sales	Percentage of EV as a proportion of light-duty vehicle sales	0%	8.6%	+19,000%	2011 – 2019
	Electric vehicle registrations	Light-duty EVs registered in B.C.	97	31,230	+32,000%	2011 – 2019
	Renewable fuel content	Per cent renewable content in transportation fuels	4.2	6.6	+58%	2010 – 2018
	Renewable fuel supply	Million litres of biofuel supplied	326	602	+84%	2010 – 2018
	Annual public transit ridership	Average number of transit trips taken per British Columbian	51	65	+27%	2007 – 2018
Buildings	Residential heat pumps	Percentage of households with heat pumps as primary or secondary heating	3%	9%	+258%	2007 – 2018
	Clean electricity	Percentage of households that use clean electricity as primary heating	36%	44%	+24%	2007 – 2017
	Energy intensity of residential buildings	Gigajoules of energy use per square-metre of floorspace for residential buildings	0.7	0.5	-27%	2007 – 2016
	Energy intensity of commercial buildings	Gigajoules of energy use per square-metre of floorspace for commercial buildings	1.2	0.9	-23%	2007 – 2016
Waste	Municipal solid waste disposal	Kilograms of waste disposed per British Columbian	703	506	-28%	2007 – 2017
	Organic waste	Per cent of population covered by an organic waste restriction	3.3	64.8	+1,850%	2007 – 2017
Industry	GHGs from industry	Million tonnes of CO <sub>2</sub> e from industrial reporters in British Columbia	19.9	18.4	-7%	2012 – 2018
	Methane from oil and gas	Million tonnes of fugitive and vented methane emissions (in CO <sub>2</sub> e) reported from the upstream oil and gas sector	2.0	1.7	-17%	2014 – 2017
Public Sector	GHGs from B.C. Public Sector	Kilotonnes of CO <sub>2</sub> e reported by the B.C. Public Sector	813	750	-8%	2010 – 2018

<sup>12</sup> Historical refers to the baseline year in which the current year data are compared. Data permitting, this historical year is 2007, the reference year for emissions reduction targets in the *Climate Change Accountability Act*. The historical year and current year are identified in the Period column.

## 2. CleanBC initiatives by sector

### CleanBC initiatives by sector

INITIATIVE	DESCRIPTION	GHG MT IN 2030
<i>Cleaner Transportation</i>		
<b>Bring down the price of clean vehicles</b>	<b>Within 20 years, every new car will be a zero-emission vehicle</b> <ul style="list-style-type: none"> <li>Mandate 100% of new cars to be zero-emission vehicles (ZEVs) by 2040; 30% ZEV by 2030 and 10% ZEV by 2025</li> </ul>	1.0
	<b>Help people to afford cleaner cars and save money on gas bills with EV incentives</b> <ul style="list-style-type: none"> <li>Continue to provide rebates for light-duty vehicles</li> <li>Expand incentives for clean buses and heavy-duty vehicles</li> </ul>	0.3
	<b>Make it easier to charge an electric car or fuel a hydrogen car</b> <ul style="list-style-type: none"> <li>Expand the charging network with home, work and public fast-charging stations and additional hydrogen fueling stations</li> <li>Enable private investment in charging and hydrogen fueling infrastructure to get more stations faster</li> </ul>	
<b>Speed up the switch to cleaner fuels</b>	<b>Phase in more renewable fuels for the gas we use</b> <ul style="list-style-type: none"> <li>Make our fuel cleaner by increasing the low carbon fuel standard to 20% by 2030</li> <li>Increase the supply of cleaner fuels by ramping up new production in B.C. of 650 million litres of renewable gasoline and diesel by 2030</li> </ul>	4.0
	<b>Make vehicles run cleaner by increasing tailpipe emissions standards for vehicles sold after 2025</b>	0.7
<b>Get to work on getting rid of gridlock</b>	<b>Help people get around with a long-term strategy to increase active transportation and look at better commuting solutions.</b>	
<b>Subtotal<sup>13</sup></b>		<b>6.0</b>
<i>Improve where we live and work</i>		
<b>Better Buildings</b>	<b>Make every building more efficient</b> <ul style="list-style-type: none"> <li>Improve the BC Building Code in phases leading up to “net-zero energy ready” by 2032</li> <li>Adopt the model National Energy Code for existing buildings by 2024</li> <li>Increase efficiency standards for heating equipment and windows</li> <li>Encourage the development of innovative and cost-effective low-carbon building solutions</li> </ul>	
<b>Support for Better Buildings</b>	<b>Focused investments in public housing to use less energy at home</b> <ul style="list-style-type: none"> <li>\$1.1 B for Capital Renewal fund for public housing to improve living conditions, energy efficiency, and reduce emissions</li> <li>Incentives to make heat pumps affordable and make homes more comfortable through building envelope upgrades</li> <li>Retrofits for public buildings so they use less energy</li> <li>Improve building energy information available to buyers and renters</li> </ul>	0.2
	<b>Make residential natural gas consumption cleaner by putting in place a minimum requirement of 15% to come from renewable gas</b>	1.6
<b>Support for Communities</b>	<ul style="list-style-type: none"> <li>Help remote communities reduce their dependence on diesel</li> <li>Support public infrastructure efficiency upgrades and fuel switching to biofuels with the CleanBC Communities Fund</li> </ul>	
<b>Subtotal</b>		<b>1.8</b>

<sup>13</sup> While policies presented in this table have been grouped together under sectoral headings, emission reduction estimates represent the difference between reference case and policy case emissions across the entire economy. Subtotals, therefore, represent the net effect of reduction policies, including effects in other sectors.

INITIATIVE	DESCRIPTION	GHG MT IN 2030
<i>Cleaner Industry</i>		
<b>Ramp up the clean growth program for industry</b>	Direct a portion of B.C.'s carbon tax paid by industry into incentives for cleaner operations	2.5
<b>Improve air quality by cutting air pollution</b>	Clean up air pollution in the lower mainland with a pilot project to test options to switch 1,700 freight trucks to natural gas and low or zero-carbon fuel by 2030 Make heavy-duty vehicles more efficient with fuel efficiency improvements, education on best driving practices	
<b>Reduce emissions from methane</b>	Reduce methane emissions from upstream oil and gas operations by 45%	0.6
<b>Industrial electrification</b>	Provide clean electricity to planned natural gas production in the Peace region Increase access to clean electricity for large operations with new transmission lines and interconnectivity to existing lines	2.9
<b>Carbon capture and storage</b>	Ensure a regulatory framework for safe and effective underground CO <sub>2</sub> storage and direct air capture	0.7
<b>Cleaner fuels for industry</b>	Make industrial natural gas consumption cleaner by putting in place a minimum requirement of 15% to come from renewable gas	0.4
<b>Subtotal</b>		<b>7.1</b>
<i>Reduce Waste</i>		
<b>Reduce waste and turn it into a clean resource</b>	Help communities achieve 95% organic waste diversion for agricultural, industrial, and municipal waste—including systems in place to capture 75% of landfill gas Waste less and make better use of it across all sectors of our economy, like forestry, agriculture, and residential areas, including renewing the BC Bioenergy Strategy and building out the bioenergy and biofuels cluster	0.7
<b>Subtotal</b>		<b>0.7</b>
<i>Helping People Get The Skills They Need</i>		
<b>Make sure British Columbians can lead the clean transition</b>	<ul style="list-style-type: none"> <li>• Develop programs like Energy Step Code training and certification, and Certified Retrofit Professional accreditation</li> <li>• Expand job training for electric and other zero-emission vehicles</li> </ul>	
<i>Measuring Our Progress</i>		
<b>Establish credible targets and a strategy to meet them</b>	<ul style="list-style-type: none"> <li>• Roll-out associated programs and enabling legislation for CleanBC</li> </ul>	
<b>Stay accountable</b>	<ul style="list-style-type: none"> <li>• Coordinate implementation and reporting for CleanBC</li> </ul>	
<b>Carbon pricing</b>	Grow the carbon tax \$5 per year 2018 to 2021 to encourage lower emission alternatives, with rebates for low and middle income British Columbians and support for clean investments	1.1
<b>Subtotal</b>		<b>1.1</b>
<b>2019 CleanBC TOTAL REDUCTIONS<sup>14</sup></b>		<b>16.7</b>

<sup>14</sup> Policy line items represent individual reduction potential estimates. Subtotals and totals are derived from combined modelling and may be lower than the sum of policies because of policy interactions (two policies contribute to the same reduction)

## APPENDIX B

---

### Final report from Climate Solutions and Clean Growth Advisory Council

# Climate Solutions and Clean Growth Advisory Council: Final Report

October 25, 2019

## Overview

The Climate Solutions and Clean Growth Advisory Council is pleased to provide this final summary of feedback and recommendations. As our two-year term ends, we thank the B.C. Government for the opportunity to contribute to British Columbia's leadership on climate change and its pursuit of clean growth and economic development.

We trust that this report will provide you with a useful summary of the work undertaken by the Council and our advice to government as it implements the CleanBC plan and establishes its next advisory council to guide and measure successful implementation.

## About the Climate Solutions and Clean Growth Advisory Council

The Council was established in the fall of 2017 with a mandate, in part, to provide advice to government on policies and actions that can contribute to carbon pollution reductions and optimize opportunities for sustainable economic development and job creation. The Council's mandate includes providing advice and feedback to the Climate Action Secretariat on how to enhance potential benefits and mitigate potential impacts of government's climate policies to ensure sustained economic prosperity and social equity.

The Council is comprised of 18 members with varied areas of expertise representing broad aspects of society in B.C., as shown on page 10.

Within the first few months of our formation, the Council identified a set of principles, listed in Appendix A, to guide our work and inform our advice to government.

Over the first year of our term, the Council worked closely with the Climate Action Secretariat to review and provide feedback on the components of the CleanBC plan, which was launched on December 5, 2018.

In our second year, we have been focused on the implementation and accountability measures for CleanBC, and on providing advice on strategies to reach B.C.'s targets as outlined in this report.

## Feedback Regarding CleanBC and Progress to Date

As we outlined in our letter of January 25, 2019, overall, the Council is supportive of the CleanBC plan. We believe it provides an ambitious and credible policy and investment road map to reducing B.C.'s greenhouse gas emissions at a scope, scale and speed required to bring us 75% of the way towards B.C.'s legislated 2030 greenhouse gas target. We acknowledge that the plan recognizes the challenge and opportunities, and the need for urgent action. There has also been encouraging progress on implementation since that time, including in the 2019 B.C. Budget, and the passing of zero-emission vehicles legislation.

We recognize that the plan:

- Commits government to a wide range of very ambitious and potentially effective policies and actions that target the key drivers of the province's greenhouse gas emissions, including shifting from fossil fuels to increased clean energy
- Combines a necessary range of environment, energy, economic and affordability priorities, actions and objectives, the details of which will need to be developed as the plan moves forward
- Builds a framework for a more collaborative economic approach to help ensure B.C. continues to benefit from a strong economy, and that our industries can remain competitive with other jurisdictions that have not yet made commitments similar to B.C.'s
- Recognizes that enduring support will necessitate ongoing engagement with Indigenous and non-Indigenous communities, industry, civil society, youth and young adults, organized labour, and utilities

In our letter dated January 25, 2019, we encouraged government to move quickly to develop a detailed implementation framework—including costing and legislative approaches—to advance the CleanBC plan. Specifically, the Council identified the following challenges:

- Significant funding is needed; this has been somewhat addressed in the last budget, but additional funding will be required going forward
- Efforts are needed to support innovation across all sectors of the economy; however, many of the innovation pathways required to meet targets, particularly in industry, are not yet in place
- The roles of local governments to help reduce emissions from buildings, transportation and waste through their policies, planning and service delivery need to be

defined, and the policies and incentives that help local government fulfill those roles need to be expanded

- Indigenous governments, along with the federal government, need to be meaningfully engaged in the process and their responses reflected in the plan's implementation
- Implementation must be both robust and mindful of opportunities and risks—particularly unintended consequences
- The Labour Readiness Plan will need to ensure that just transitions for workers are addressed, and that the requirement for future workforce opportunities is successfully cultivated
- Ensuring industries remain competitive in relation to jurisdictions with less stringent carbon or other policies requires effective policy initiatives for all sectors, particularly emissions-intensive, trade-exposed (EITE) industries

One important area of concern with the implementation of Phase 1 relates to the low-carbon fuel standard and the renewable gas standard, both of which account for a significant share of the reductions in CleanBC. Our understanding is that government is considering a broader range of compliance options for each policy than initially included in the CleanBC modelling. We are supportive of this direction because it opens up the most opportunities for innovation and lower-cost solutions. However, the change also introduces a risk that the package of CleanBC policies will achieve fewer reductions than previously modelled, because the low-carbon fuel standard and the renewable gas standard will include reductions covered by other policies. To mitigate this risk, we encourage government to either revise the 2030 reduction targets for both policies to ensure that the total reductions align with the levels anticipated when CleanBC was launched, or revise the Phase 2 work to identify the reductions through other policies.

As this Council wraps up its two-year mandate, recognizing that emission reductions have only declined 2% from the 2007 baseline as of the 2017 Provincial Greenhouse Gas Emissions Inventory, the Council members have the following broad advice for government, with further specific recommendations detailed below:

- Government should act swiftly to maintain the momentum on implementing the Phase 1 policies and programs, while working aggressively to plan for and start implementation of the Phase 2 policies to ensure we have a complete plan to meet targets
- Government should develop a clean energy strategy that clearly identifies how all of the commitments and policy actions will be achieved; it should also detail the best-suited clean energy sources to meet future clean energy demands
- Government should prioritize coordination across government ministries, particularly the Ministry of Energy, Mines and Petroleum Resources and the Climate Action Secretariat as the lead agencies, in addition to the Ministries of Environment and Climate Change; Forest, Lands, Natural Resource Operations and Rural Development; Transportation and Infrastructure; Jobs, Trade and Technology; Municipal Affairs and Housing; and Indigenous Relations and Reconciliation, and the federal government and other stakeholders, to ensure CleanBC is implemented in a comprehensive manner
- Government should continue to deepen its engagement with Indigenous and local governments to ensure CleanBC is implemented as effectively as possible, and that Indigenous and local governments are fully involved in development of policies for Phase 2
- Government should urgently develop an action plan based on its 2019 Climate Risk Assessment to address climate adaptation
- Government should actively engage with various sectors of the economy, including the innovation and technology sector, to understand the impacts of CleanBC, to seek feedback on additional solutions to achieve the remaining 25% reduction in emissions and to consider the advice in developing policy alternatives
- Government should identify specific actions to support industrial competitiveness through the transition to a low-carbon economy, and avoid carbon and capital leakage to jurisdictions with less stringent climate action or other policies or established measures to safeguard trade-exposed sectors; this should consider the full range of policy tools at the government's disposal
- Develop a comprehensive engagement strategy with youth and young adults to ensure their perspectives and voices form part of all climate action plans and policies
- As new mitigation policies continue to be developed for the first 75% and the remaining 25%, government should look for opportunities that bring together mitigation and adaptation in ways that are synergistic
- Finally, the Council is aware that Internationally Transferred Mitigation Outcomes (ITMOs) are an important part of ongoing international climate negotiations. The B.C. government should be a proactive voice, with the government of Canada, to ensure that any ITMOs have a high degree of credibility and transparency. Irrespective of future decisions regarding the use of ITMOs, the B.C. government should also continue to identify and implement opportunities to close the gap to its 2030 targets.

## Recommendations Regarding CleanBC Phase 2

As noted earlier, the CleanBC plan launched in December 2018 is intended to achieve 75% of required 2030 emissions reductions. We believe that this was appropriate as a first phase, assuming that Phase 2 would be initiated quickly.

At our June 10, 2019 meeting, the Council spent some time discussing the potential policies that could address the remaining 25% of carbon reductions required by 2030.

Key themes discussed by the Council:

- The need to broaden the scope of actions to fully incorporate actions that were originally absent or only partially reflected in the CleanBC plan
- The innovative pathway to long-term targets must include new and emerging technologies—many of which are being developed in B.C.—and regulations that are detailed and accounted for, as well as appropriate contingency plans to manage risk
- The need to consider ongoing funding sources to support the necessary infrastructure, adoption and development of new technologies, etc.
- The need to be mindful of costs of new policies; consider both the short-term and long-term societal costs of actions, as well as the cost to society of not taking strong actions
- The need to consider the implied behavioural changes and impacts for citizens of the shift to a low-carbon economy, including effects on lifestyle, convenience, cost of living, etc.
- The need for the CleanBC plan to address competitiveness issues for existing industries, particularly in the resource sector, and the impact on B.C.'s overall economic competitiveness in comparison with jurisdictions with less stringent climate action programs
- Actions implemented under Phase 2 should be informed by analysis from B.C.'s Low-Carbon Industrial Strategy (an initiative underway with the Business Council of British Columbia), which is aimed at unlocking B.C.'s full economic potential, maintaining economic competitiveness through the transition to a low-carbon economy, and supplying low-carbon goods and services to the world
- Ensure that measures in Phase 2 support the economic transition of all businesses, including small and medium-sized enterprises, to a low-carbon economy
- As the industrial sector in B.C. continues to transform, the Council recommends that government develop comprehensive policies that will ensure the shifts in emissions from B.C.'s industrial sector fit within CleanBC targets and Canada's global responsibilities under the Paris Agreement

Recommendations:

### • Phase 2 and B.C.'s long-term targets:

- Accelerate technology switches; in order to reach climate goals, pursue step change technologies where feasible and cost-effective, rather than bridging technologies (e.g., utilizing electric vehicles versus compressed natural gas vehicles)
- When implementing policy change, ensure equal thought is put into the associated behavioural change and what is required to support that change, keeping in mind how British Columbians live and work
- As policies to reach the 2030 target are formulated, be mindful of the longer-term target of an 80% reduction by 2050
- Review policies to strengthen those that are cost-effective

### • Government's focus and alignment with other priorities:

- Government should prioritize support for cost-effective technological innovation and solutions for industry. This will include, but will not be limited to, innovation in the clean tech space. Technological innovation will enable B.C. to achieve its climate goals while creating economic opportunity.
- Highlight co-benefits and prioritize actions/system changes that address multiple priorities (health, affordability, economic opportunity, etc.)
- Government incentives for businesses to meet CleanBC targets should focus on key areas of importance (e.g., high emitters, highly competitive markets), not just where incentives are easy; early adopters and movers should not be penalized for leadership, and EITE industries should be protected to avoid carbon leakage
- Government must create strong systems across all Ministries to ensure CleanBC alignment (e.g., include deliverables and responsibilities related to CleanBC in all Minister mandate letters)

## Recommendations Regarding Implementation Plan

We have appreciated the opportunity to comment on the draft implementation plan presented to the Council on January 25, 2019. For those policies and programs that have been identified, the timelines put forward by government seem reasonable. However, we note that there appear to be some significant missing pieces of the implementation plan.

Recommendations to close those gaps are provided below. We note that a future Climate Advisory Council has a strong role to play in providing advice to government in these areas:

- **Accounting for major policy initiatives/review:** Government should provide additional detail regarding major policy initiatives or reviews, such as the review of BC Hydro, electrification, rate reform, public sector leadership in low-carbon procurement, and the Low-Carbon Industrial Strategy. Any policy changes or new policies implemented affecting the objectives of CleanBC should be done transparently, with clear accounting for how they affect those objectives, both positively and negatively.
- **Establishing a “climate lens” for policy and program decision-making:** Government should use a Treasury Board directive that requires any new program proposal to include an assessment of its impact on greenhouse gas emissions, including consideration of opportunities to mitigate any potential increase in emissions.
- **Enhancing an all-of-government approach:** Government should ensure adequate resourcing of all Ministries supporting CleanBC implementation, and create durable and transparent cross-government working groups that align with sectors identified in CleanBC (transportation, buildings, industry).
- **Stronger focus on just transition planning, including the Labour Readiness Plan:** Government needs a stronger plan for labour readiness and adjustment. This would take the form of more funding and details regarding the assessment, timeline, output and desired outcomes, and the Ministry or Ministries responsible.
- **Clarifying the role of local government in CleanBC:** Government should be clearer about the role of local government in the implementation of CleanBC, including land use planning, zoning decisions, bylaws, permitting and licensing, etc. The need for financial and capacity support for smaller communities also needs to be recognized. This was a significant gap identified by the Council, and should be an area where members of a future advisory council could offer guidance.
- **Improve inter-governmental coordination:** Government should be appropriately resourcing and prioritizing implementation of CleanBC across B.C. Ministries, as well as coordinating and collaborating with the federal government and other provincial governments.
- **Engage Council on public awareness and communications:** Government should formally engage with a future advisory council on plans for ongoing communications and engagement strategy with the public and specific groups, as identified earlier regarding the ongoing implementation of CleanBC.

## Recommendations Regarding Accountability Framework

The B.C. government has already committed to four components that the Council recommends should be included in a robust accountability framework. These are:

- **2030 emissions reduction target.** The target of a 40% reduction in emissions from 2007 levels by 2030 is legislated in the Climate Change Accountability Act. This corresponds, based on current reporting methodology, to 38 megatonnes (MT) of emissions in 2030.
- **Medium-term emissions forecasts to 2030.** CleanBC includes modelling of emissions by sector to 2030, with current forecasts achieving 75% of the 2030 emissions reduction target. This modelling will be updated annually, including forecasting of emissions to 2030 based on new policies, actions and industrial development. The model should also demonstrate a pathway to achieve B.C.'s full 2030 emissions target. This will allow for important planning mechanisms, including 2030 targets and annual emissions targets (see additional recommendation below) to be established.
- **Three-year emissions forecasts.** CleanBC commits to an amendment of the Climate Change Accountability Act that requires development of three-year emissions forecasts. These forecasts will be updated annually, concurrent with the medium-term emissions forecast, and will take into account expected emissions reductions due to CleanBC actions and any increases or decreases due to other policies, trends and pressures.
- **Three-year financial budget to support meeting reduction targets.** As part of CleanBC fiscal planning, three-year fiscal implementation plans will be tabled annually with the Ministry of Finance's Annual Budget and included in the service plans of responsible Ministries. This will help ensure climate policies are adequately funded and ensure cross-Ministerial responsibility for achieving targets.

The Council has two additional recommendations for government's consideration on the accountability framework. These were previously discussed as a Council at the June 2019 meeting and provided to government:

- **Establish 2030 sectoral emissions reduction targets.** Introduced in 2018, the Climate Change Accountability Act gives Ministerial power to establish emissions goals for individual sectors. Government should establish sectoral goals to help ensure that Ministries play an active role in identifying emissions reduction opportunities in the sectors they regulate. To allow for flexibility, sectoral targets could be expressed as a range.
- **Establish annual emissions target ranges five years in advance.** To allow for improved planning and transparency in comparison to three-year emissions forecasts, government should establish, through legislation, annual economy-wide target ranges for the next three years, based on the legislated 2030 emissions target. We recommend government calculate these based on their medium-term emissions forecast in order to help ensure B.C. is on track to achieve its 2030 emissions target. In combination with the three-year emissions forecasts, these annual target ranges will help enable transparency in determining whether provincial emissions forecasts are on track to achieving targets. We recommend that, in its public reporting, government provide an analysis and discussion of the cause and effects underlying any differences between forecasts and targets (e.g., economic context, technological advances).

Along with the four components that government has already committed to, adoption of these additional recommendations would allow for enhanced planning and transparency.

## Recommendations Regarding A Future Advisory Council

We applaud the government for establishing the Climate Solutions and Clean Growth Advisory Council and for engaging with us prior to, during and following the development of the CleanBC plan.

We offer the following considerations regarding the establishment of a future advisory council to ensure that this group and its process is set up for success:

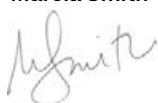
- **Establish clearer terms of reference (TORs).** Council felt that its TORs were vague and that clear roles and responsibilities are important for the next Council. Clear TORs will improve the Council's ability to provide government with meaningful and effective input.
- **Council should be connected to other ongoing initiatives.** The Council should not operate in isolation—it needs to be clearly connected to other government strategies aimed at achieving CleanBC objectives, such as the Low-Carbon Industrial Strategy. Operating in isolation will lead to ineffective advice and ineffective policy.
- **Council's purpose should be connected with the government's social and economic objectives.** A future advisory council will benefit from further details of the government's economic and social strategies, and the connection between those and other government priorities and initiatives such as the Labour Readiness Plan or the Emerging Economies Task Force. Reconciling these important objectives should be part of future Council engagement and will also need to be appropriately embedded in future updates of the CleanBC plan.
- **Maintain diversity of Council membership while keeping size manageable.** In addition to the perspectives and interests represented on the current Council, the membership of the future advisory council should consider other voices in climate, clean energy and clean economy. This should include representation of perspectives such as youth, rural communities, affordable living, utilities, small business and industry, and adaptation. This could include individuals who represent multiple important perspectives.
- **Formalize the use of subcommittees.** As you know, the Council established a Technical Advisory Committee, an Engagement Committee and an Adaptation subcommittee, which were not originally part of the Council's TOR. We encourage government to formalize these three subcommittees with separate TORs, and to enable the Council and the Climate Action Secretariat to establish and/or include additional subcommittees as needed.
- **Ensure that the future council has access to relevant technical and other expertise.** The Council obviously benefits from the technical expertise of Climate Action Secretariat and consultants they engage, but also from occasional speakers and experts who speak directly to the Council about their work and about related research and initiatives in other jurisdictions. Ensure that the future advisory council has access to the expertise that will be required to fulfill its mandate.
- **Engage the future advisory council early and often.** As with any good consultative process, government should engage with the new advisory council as early as possible in the development of any future plans, and then at a minimum, quarterly through their development, to ensure that government has an opportunity to benefit from the perspectives and expertise of new advisory council members.
- **Develop an orientation and onboarding process.** Given the diverse backgrounds of Council members, government should conduct a thorough onboarding process to educate new members regarding the mandate of the Council and the subject matter that the Council will be discussing. If it is helpful, the co-chairs of the current Council could provide a presentation regarding our work to the new Council, once established. The current Council also believes that more frequent meetings would be beneficial.

## Acknowledgements

The Council would like to thank you and the Climate Action Secretariat for its work in supporting our Council meetings and responding to our information requests.

We again reiterate our appreciation for the opportunity to have been of service to the government of B.C., and we look forward to seeing the successful implementation of CleanBC for the benefit of all British Columbians.

### Marcia Smith



Senior VP, Sustainability & External Affairs  
Teck Resources

### Merran Smith



Executive Director  
Clean Energy Canada

Co-chairs, Climate Solutions and Clean Growth Advisory Council

### Taylor Bachrach

Mayor  
Town of Smithers

### Aaron Sumexheltza

Councillor  
Lower Nicola Indian Band

### Matt Horne

Climate Policy Manager  
City of Vancouver

### Karen Tam Wu

Regional Director  
British Columbia

### Lee Loftus

Past President  
BC Building Trades Council

### Katheryn Teneese

Chair  
Ktunaxa Nation Council

### Gavin McGarrigle

Western Regional Director  
Unifor

### Jill Tipping

President and CEO  
BC Tech Association

### Michelle Molnar

Environmental Economist  
David Suzuki Foundation

### Tesicca Truong

Co-Founder  
CityHive

### Nancy Olewiler

Professor  
School of Public Policy Simon Fraser University

### Josie Osborne

Mayor  
District of Tofino

### DJ Pohl

President  
Fraser Valley Labour Council

### Susan Yurkovich

President and CEO  
Council of Forest Industries

### Sybil Seitzinger

Executive Director, Pacific Institute for Climate Solutions  
University of Victoria

## Appendix A

### Climate Solutions and Clean Growth Advisory Council Principles

- 1. Demonstrating ambitious leadership.** We strive to sustain a strong economy, meet our legislated targets and contribute to global climate action by sharing our policy successes and solutions with other jurisdictions while learning from the experiences of others.
- 2. Ensuring credible, durable and cost-effective policies.** British Columbia needs a suite of credible, durable and cost-effective climate policies and regulations to reduce carbon emissions. Policies need to be designed to support multiple benefits, including social, environmental and economic goals.
- 3. Creating prosperity and jobs.** Our recommendations will seek to build a strong, sustainable economy that is steadily reducing greenhouse gas emissions and growing investments while creating and maintaining jobs.
- 4. Supporting a just transition.** We support a just transition, meaningful employment, secure jobs and fair wages, including, for example, the education and training of workers and support for communities.
- 5. Enabling industry competitiveness.** We support actions to enable industry competitiveness so that companies can continue to thrive and innovate while reducing emissions.
- 6. Increasing community resilience.** We support mitigation policies and actions that concurrently strengthen community resilience to climate impacts.
- 7. Respecting diversity and ensuring equity.** We respect British Columbia's diverse cultures, regions, sectors and income levels, and support fairly distributing benefits while minimizing impacts.
- 8. Committing to meaningful engagement.** We support meaningful engagement with British Columbians to ensure the Climate and Clean Growth Strategy resonates with their communities, their work and their way of life.

**cleanBC.ca**

February 2020

Copyright © 2020, Province of British Columbia  
All rights reserved.

