THE SOLUTION SERIES

CLEAN ENERGY CANADA

A Clean Economy and Jobs Plan for British Columbia

Building a Diverse and Prosperous Economy Through Climate Leadership

OCTOBER 2015

Overview

Clean Energy Canada retained Navius Research to model the job and economic implications of meeting British Columbia's 2020 and 2050 climate targets. Would jobs grow or decline? Would the economy thrive or would GDP drop?

We found that both jobs and the economy would grow while B.C. met its 2050 climate target. This document presents highlights of the analysis and key outcomes, as well as the policy recipe that will grow British Columbia's economy and create stable, long-term jobs while maintaining the province's global stature as a climate leader.

A Clean Economy and Jobs Plan for British Columbia aims to inform and stimulate public discussion during the development of B.C.'s new Climate Action Plan 2.0 and in the lead-up to the global climate talks in Paris.

The full Navius Research assessment is titled *A Plan for Climate Leadership in British Columbia: Forecasting the Benefits and Costs of Strengthening British Columbia's Greenhouse Gas Policies.* It is available at cleanenergycanada.org.

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Cover: David Dodge, Green Energy Futures.
Page 1: A forestry worker in B.C. Photo: iStock.


Not a revolution,
but an evolution.

Building a Thriving Clean Economy

Not a revolution, but an evolution.

That's what's in store for British Columbia's economy as we continue to show climate leadership. The core of our economy remains largely unchanged, some sectors evolve and transition, and emerging sectors thrive. All contribute to continued growth and prosperity, while pollution falls.

With sustained climate leadership, B.C.'s future is bright – we'll see roughly 900,000 new jobs between now and 2050, with 270,000 created in the next 10 years. Provincial GDP is expected to nearly double to $425 billion a year by 2050, growing by $46 billion in the next decade alone. That rate of growth – roughly two per cent a year – is consistent with the growth in economic activity expected without continued climate leadership.

Climate leadership is working.

This shouldn't come as a surprise to British Columbians. We've demonstrated to the world how to grow our economy while cutting carbon pollution. B.C. introduced North America's first revenue-neutral carbon tax, and committed to ensuring the electricity grid remains overwhelmingly clean and renewable. Other policies, such as our clean fuel standard, have lowered emissions and helped clear the air. Meanwhile, British Columbia's economic growth outpaced the Canadian average between 2008 and 2012.[1] Citizens and corporations enjoy among the lowest income tax and corporate tax rates in the country.

And that's why we need to keep forging ahead. British Columbia's carbon pollution is starting to increase again. The fires, drought and heat experienced this year provide a glimpse of the costs in store for our province as the climate becomes increasingly unstable. The economic opportunities – both within and outside our borders – arising from a transition to a climate-friendly future are now valued at $780 billion and growing.[2]

1 British Columbia. BC Stats. "BC Economic Accounts, Gross Domestic Product, Expenditure, by Region." Nov. 2014. Sept. 2015 <http://www.bcstats.gov.bc.ca/Files/7b8a94c1-136a-4c27-851e-4a39dea80f0a/BCEA-GrossDomesticProductExpenditureBasedbyRegion.xlsx>

2 Analytica Advisors. "Canadian Technology Industry Report." 2015. Print.

Page 2: Workers prepare to erect a wind turbine in Tumbler Ridge, B.C. David Dodge, Green Energy Futures.
Page 3: Early morning harvest of B.C. cranberries. Photo: iStock.

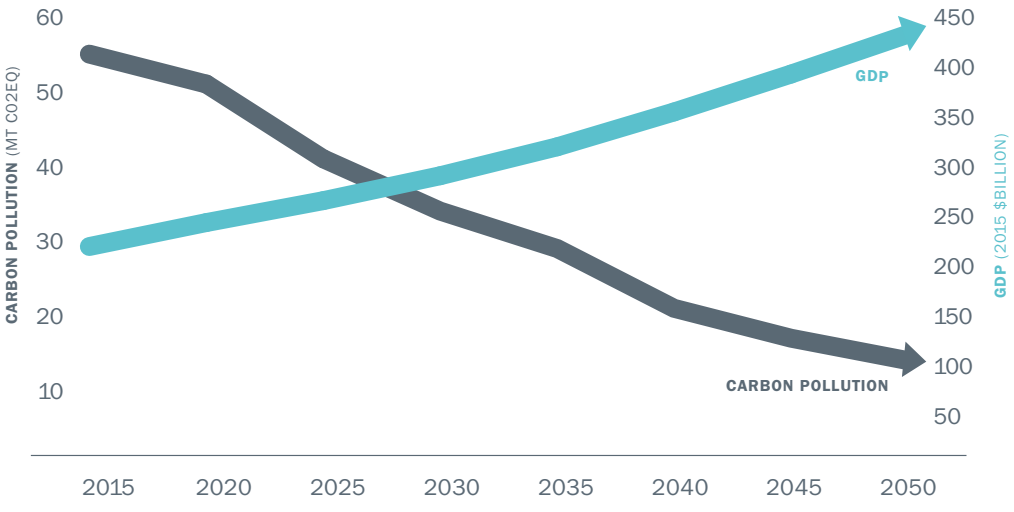
As the economy evolves to produce less carbon pollution, B.C.'s backbone resource sector remains strong.

This evolving context requires an evolving plan to create jobs and grow our economy. So we worked with Navius Research – a top climate, economy and energy modelling firm – to explore how British Columbia can prosper while adopting the policies required to meet the province's legislated greenhouse gas reduction targets.

Our research found not only that jobs and GDP will continue to grow as B.C. delivers on its climate commitments, but that we will be better off – and more competitive – as the rest of North America follows our climate policy footsteps.

None of this requires fundamentally reinventing British Columbia's economy. Even as the economy evolves to produce less carbon pollution, B.C.'s backbone resource sector remains strong. Meanwhile, sectors such as renewable power generation, manufacturing and biofuels will surge, creating new jobs across the province.

As carbon pollution falls, British Columbia's GDP climbs



The Policies of Possibility

At its core, this *Clean Economy and Jobs Plan* rests on two policy actions designed to unleash innovation and the power of markets to meet B.C.'s climate targets:

- **Introduce and expand clean standards for vehicles, buildings, and industry.**
- **Create a clean economy investment and tax rebate program.**

The standards drive down carbon pollution, while the investment program ensures B.C. remains affordable and competitive. The investment and rebate program would channel revenue from an increasing carbon price into clean energy solutions.

Note: We present each policy in more detail at the end of this document. For a more detailed description, please see the companion technical report by Navius Research at cleanenergycanada.org.

The Navius modelling assumes carbon tax revenues are recycled through tax breaks only. The results in this report are based on that assumption. However, we expect similar results if some of those revenues were directed towards clean economy investment based on forthcoming research by the Pembina Institute and Clean Energy Canada's own ongoing research.

"We will continue to provide a positive example to the world that there is no need to choose between economic growth and fighting climate change."

– The Honourable Judith Guichon, Lieutenant Governor of British Columbia, Speech from the Throne, February 10, 2015

Left: Physics researcher David Morrissey inspects one of the beamlines in the TRIUMF lab in Vancouver. Photo: Ali Lambert, Flickr.
Page 4: Growth in renewable electricity is set to outpace the rest of B.C.'s economy as demand for clean energy rises. Photo: Alessandro Colle, Shutterstock.

Here's a snapshot of where British Columbians will be working in 2025 as the province continues to show climate leadership:

+32,000

Traditional Resources

Workers across British Columbia will find **32,000 more jobs** in mining, forestry and agri-foods. The mining sector also plays an important role in the clean energy transition, as energy use shifts from fossil fuels to biofuels and electricity.

+29,000

Clean Energy and Technology

People with expertise in engineering, construction, project management and more will have new opportunities as **29,000 jobs are created** in renewable electricity generation, biofuels and manufacturing. Growth in these sectors will outpace the rest of the economy as demand rises for clean energy and new technologies.

+3,000

Natural Gas

Despite the move to cleaner energy sources, **3,000 new jobs** are created as natural gas production shifts to focus on export opportunities.

+210,000

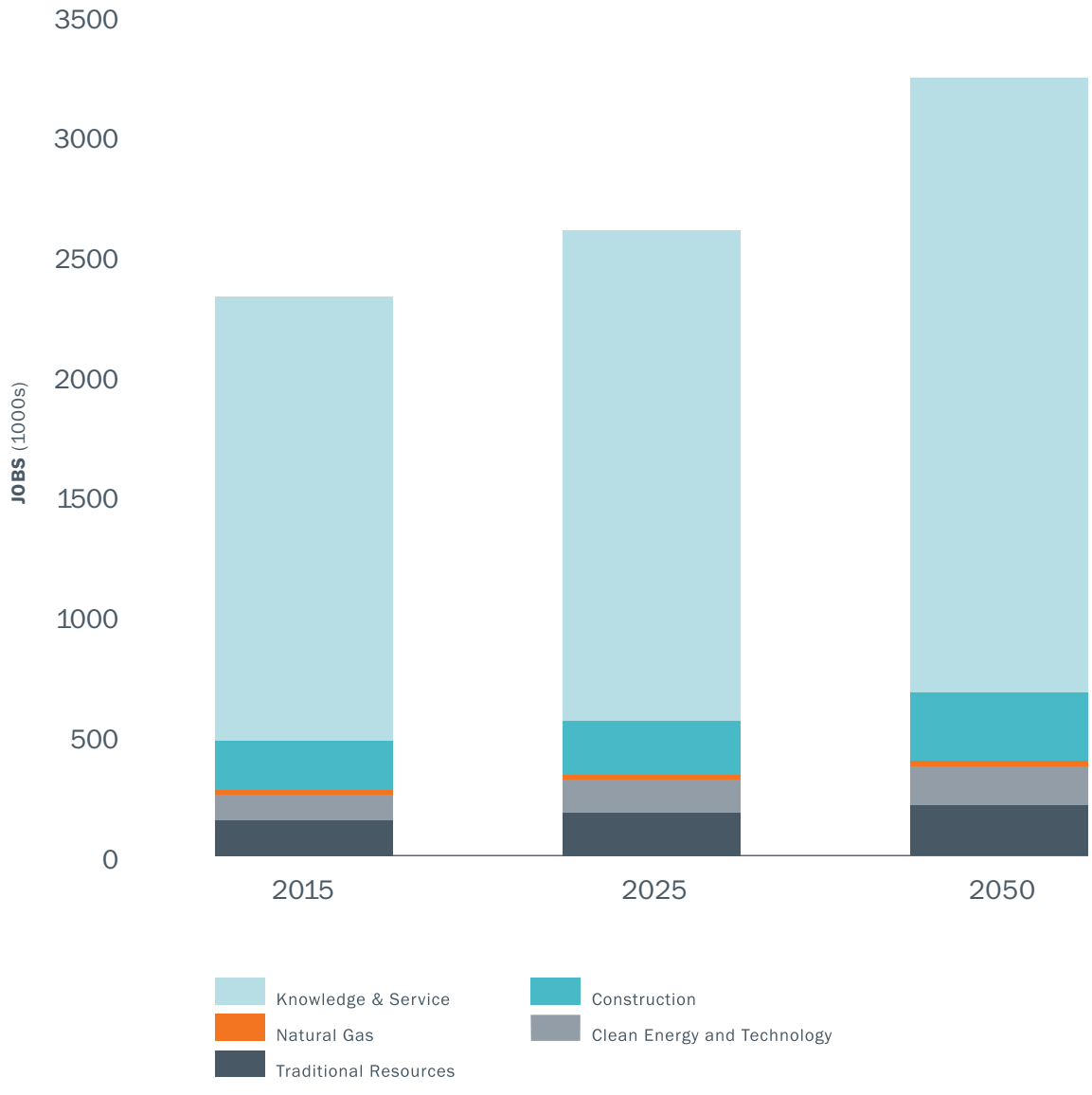
Knowledge and Services

Most British Columbians continue to work in the knowledge and service sector, taking advantage of **210,000 new job openings**.

As the above snapshot illustrates, becoming more competitive in a market where clean energy and technologies have the advantage means some industries will transition and transform, and new opportunities will emerge. But this isn't a recipe for a whole new British Columbia – it's a plan to build a diverse, strong and growing economy throughout the province now and into the decades ahead.

Left: A Huu-ay-aht forestry worker. Photo courtesy of B.C. Government

Direct Jobs in B.C. by Sector



As B.C. meets its climate commitments between now and 2050, the industries and jobs that British Columbia is known for remain similar to today, while renewable energy and clean technology development take off.

British Columbia's future is bright – and surprisingly familiar. Looking out to 2025 and beyond, iconic industries like forestry, mining and agriculture remain important and healthy in a context where B.C. remains a climate leader. The main difference is these industries will produce less carbon pollution.

Background: The Forrest Kerr run-of-river hydroelectric project on the Iskut River in northwestern B.C. Photo: Courtesy of AltaGas Ltd.

Left: Workers pour concrete at a new hospital and health centre in Burns Lake, B.C. Photo courtesy of B.C. Northern Health Authority.

Hard Hat Nation

32,000
new resource jobs by 2025

A world driving down carbon pollution will still need B.C.'s resources to make cars, chairs and potato chips.

B.C.'s Traditional Resource Sectors Thrive

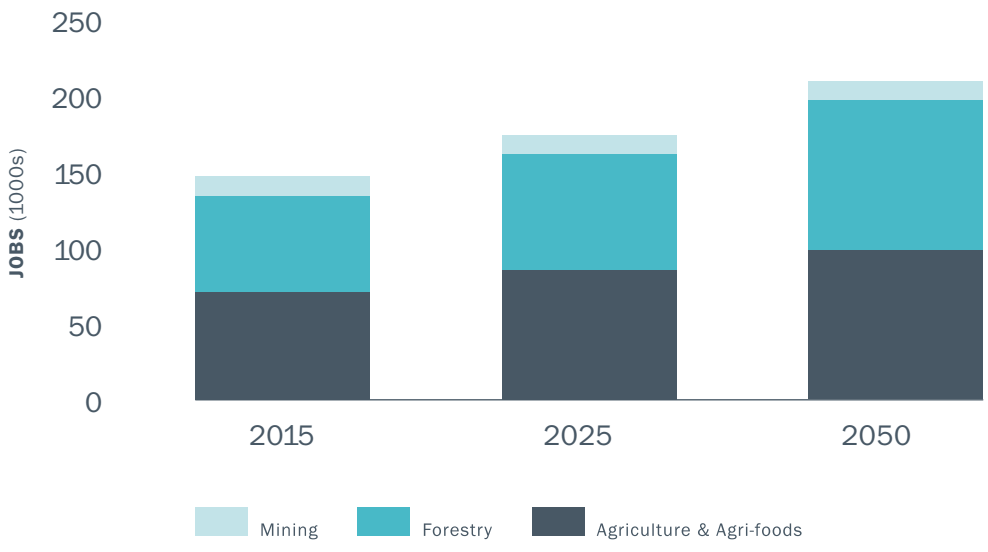
Mining. Forestry. Agriculture. British Columbians across the province will find new jobs in these sectors well into the future as B.C. meets its climate commitments. In the next decade, B.C.'s traditional resource industries will add 32,000 new jobs. Another 30,000 jobs will be created by 2050 for a total of nearly 62,000 new jobs, keeping B.C.'s rural communities diverse and prosperous.

Why? Because a world driving down carbon pollution will still need the resources B.C. can provide to help make cars, chairs and potato chips.

Companies will continue to invest in British Columbia – employing farmers, miners, and mill workers from the Fraser Valley to Tumbler Ridge and beyond.

Under our *Clean Economy and Jobs Plan*, these sectors gradually remove carbon pollution from their operations as demand increases for more efficient equipment that uses renewable electricity and fuels like ethanol, biodiesel and wood waste. By 2025 – a decade from now – we expect the mining sector will use 14 per cent less fossil fuel than today, and that use will continue to decline through 2050.

Direct jobs in B.C.'s traditional resource sectors



Left: Dr. Judith Sayers, former chief of the Hupacsath First Nation, at the China Creek run-of-river hydro powerhouse in Port Alberni, B.C. **Right:** Used vegetable oil can be dropped off at the Cowichan Biodiesel Co-op facility in Duncan, B.C. Photos: David Dodge, Green Energy Futures.

Rising Stars

Clean Energy and Technology Take Off

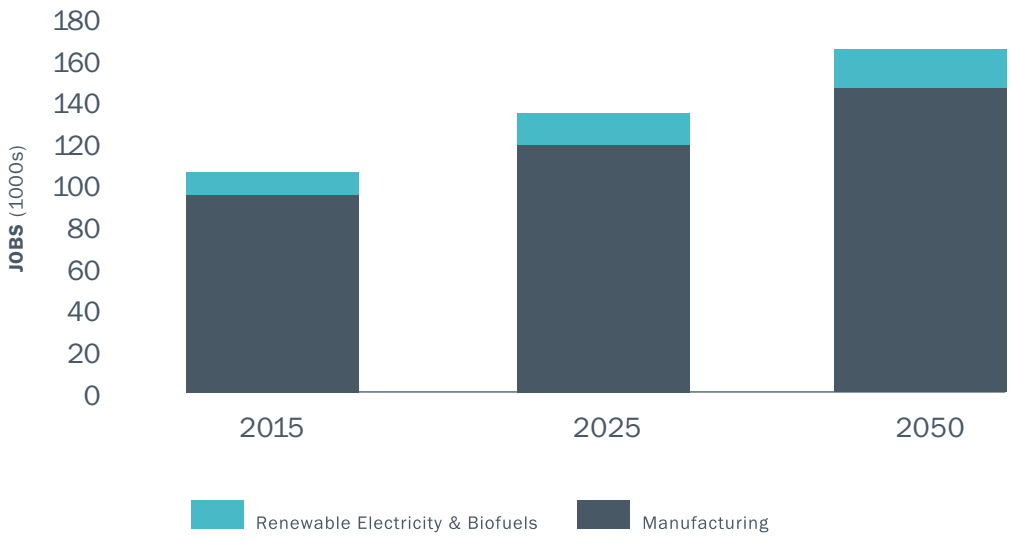
Renewable electricity generation, biofuels, and manufacturing grow quicker in the economy of tomorrow. We can expect to see 29,000 new jobs in these emerging sectors by 2025, topped up with 30,000 more by 2050, reaching 59,000 in all.

Under our *Clean Economy and Jobs Plan*, renewable electricity and biofuels provide the clean energy to power B.C.'s growing economy, while the manufacturing sector builds the technologies for the province and the rest of the world to produce that energy and use it efficiently.

29,000

news jobs in renewables, biofuels and manufacturing by 2025

Direct jobs in B.C.'s renewable energy and manufacturing sectors



What is a renewable energy job?

The demand for clean energy will climb as British Columbians switch to heat pumps to heat their homes and buy more electric vehicles, and as industry uses electricity instead of natural gas for power. That demand means more projects – and the jobs that go with them – to harness the power of the wind, water, sun and earth to provide electricity.

People living near wind projects are typically paid to help build and operate them. Forty per cent of construction staff at the Cape Scott Wind Farm came from the surrounding communities. Workers will be needed to build roads, install electrical systems, pour concrete and handle all aspects of project engineering.

As B.C. continues to reduce its carbon pollution, the number of people working to build new renewable energy projects will more than quadruple – with nearly 3,000 direct jobs, up from 700 today. Completed projects will employ 12,000 people by 2025 and 14,000 by 2050. At that point, B.C.'s renewable energy sector will employ as many people as the mining sector.

Left: The Burrard Generating Station is maintained by BC Hydro to generate electricity from natural gas. Photo: Niall Williams, Flickr.

A 'Transition Fuel' in Transition

3,000
new natural gas jobs by 2025

B.C.'s Natural Gas Sector Adapts

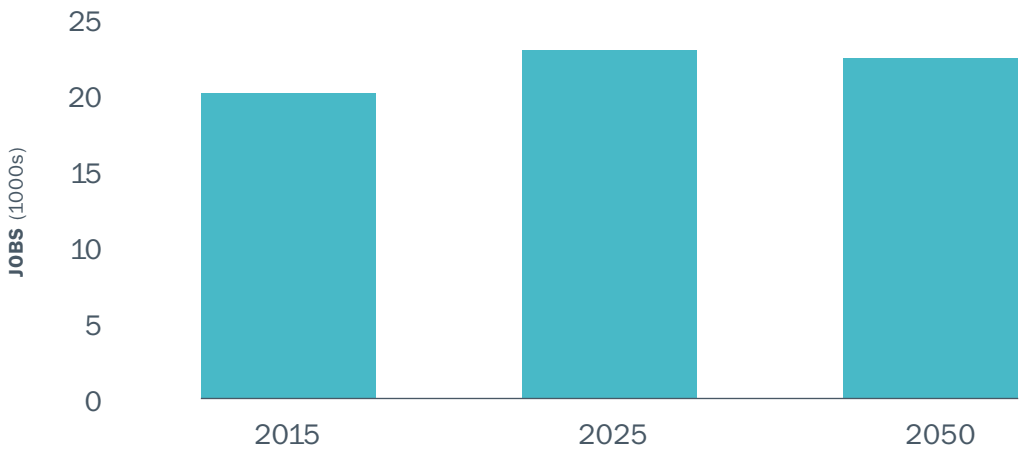
British Columbia's natural gas sector continues to provide jobs and contribute to the economy well into the 21st century, but as the province steadily sheds carbon pollution this sector shifts focus.

Today natural gas heats many of the province's homes and provides energy for many industries. But in the years leading up to 2050, the fuel gradually cedes market share to cleaner technologies and processes – a trend that's expected to emerge throughout North America.

Under our *Clean Economy and Jobs Plan*, as alternatives to natural gas take off, the industry shifts from selling natural gas to British Columbians to selling gas to Asia. Yet, despite the shift in focus, the sector continues to create jobs – adding 3,000 jobs by 2025, increasing total provincial employment in the sector to 23,000 people. This level of employment remains stable out to 2050.

If development of the LNG industry goes ahead, then our *Clean Economy and Jobs Plan* includes exporting up to 13 million tonnes of LNG per year out to 2050 from three LNG terminals in British Columbia.

Direct jobs in natural gas production and liquification



Left: Paramedics at work in rural B.C. Photo: Province of British Columbia, Flickr.

Going Strong

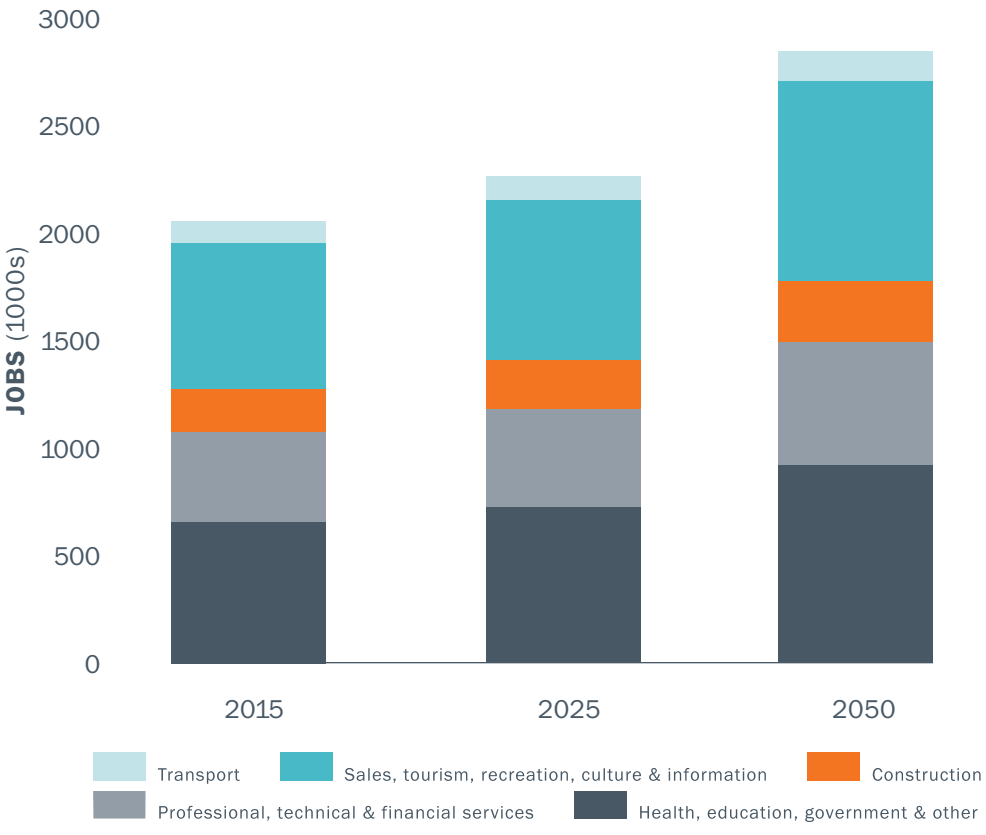
Opportunities Abound in the Knowledge and Service Sectors

210,000
new knowledge and service sector jobs by 2025

More than 85 per cent of British Columbians today work in construction, finance, professional services, health, education and government – jobs that collectively make up the service sector. That picture doesn't change much in the decades ahead. By 2050, we can expect to see a total of 770,000 more employment opportunities than exist today in these sectors.

Under our *Clean Economy and Jobs Plan*, 210,000 new jobs will be created in these sectors by 2025, with another 560,000 positions added by 2050. The opportunities are diverse – from software developers to financial analysts to restaurant workers, people with a wide variety of skills will find new opportunities in the knowledge and service sectors in the future.

Direct jobs in B.C.'s service sectors



As British Columbians transition to cleaner vehicles and more efficient homes, they will pay less for energy than they do today – whether they live in the Peace River Region or Vancouver.

Background: Bryn Davidson, principal of Lanefab Design/Build, designs energy efficient homes in Vancouver. Photo: David Dodge, Green Energy Futures.

The Future is Affordable

Even though energy rates are projected to increase over the next 10 years, British Columbians can expect to spend less on energy overall by boosting efficiency at home and work, and upgrading to vehicles that use less fuel.

The Lower Mainland:

Fifteen years from now, an average Vancouver household can expect to save $900 a year on their energy bills. Today, the average Vancouverite drives a small car, lives in an apartment or town home and spends $2,600 a year on electricity, natural gas and gasoline. By 2030, energy spending would drop by $900, with the average household spending $1,700 a year entirely on electricity. Households save money by switching from furnace to heat pump, trading their gas-powered vehicle for an electric one, and installing more efficient lights throughout the house – all during normal renovation periods.

Up North:

The energy savings are even higher for the average household in the Peace River region. Today, living in the region typically means driving a truck, living in a house and spending up to $6,000 a year on energy – mainly gasoline and natural gas for heating. On average, a detached house will be larger than an apartment and, since the Peace River Region is farther north, households spend nearly twice as much money on heating and three times as much on gasoline compared to the average Vancouver household. However, by switching to a hybrid truck and heat-pump system, rural households can cut energy costs by $1,200 a year by 2030.

Left: The Vancouver Sky Train. Photo: Can Pac Swire, Flickr.

Charting the Course

The policy tools we need to build a thriving clean economy

It's clear that B.C. can continue to create jobs and prosperity while leading on climate. It is affordable to all British Columbians – whether they live in the rural regions or the cities.

A mix of policies, illustrated here, are required to build B.C.'s clean economy. Those policies are built around two essential actions:

1. **Standards:** Set standards that require buildings, fuels, vehicles and industry to produce less carbon pollution over time.
2. **Investment:** Create a clean economy investment and tax rebate program – paid for through new carbon tax revenues – to help businesses compete, keep B.C. affordable and invest in clean infrastructure.

We recommend including this mix of policies in British Columbia's Climate Leadership Plan to enable British Columbia to remain a climate leader while growing the economy, creating jobs, and positioning our province to thrive in the decades ahead.

Raise the Bar

Cleaner Buildings

Require new furnaces and hot water heaters purchased after 2025 to emit no carbon pollution. After 2030, require all new buildings and homes to produce as much energy as they consume.

Cleaner Fuels

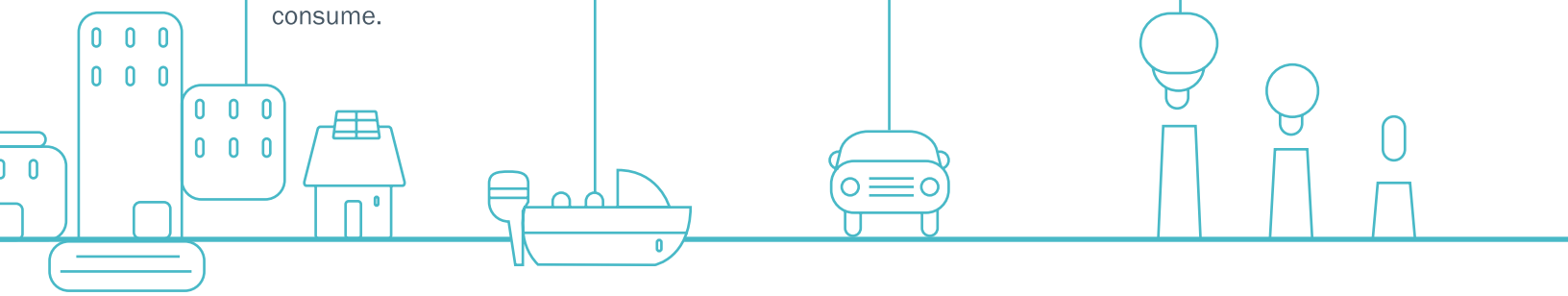
Require the fuels British Columbians use in their cars, trucks and boats, to be 20% cleaner by 2030 than in 2010.

Cleaner Vehicles

Increase cleaner vehicle options for British Columbians so at least 5% of new vehicles sold by 2020 are electric, plug-in hybrid or hydrogen models.

Cleaner Industry

Apply the existing intensity standard to LNG facilities. For other industries, set a carbon performance standard and reduce it over time.



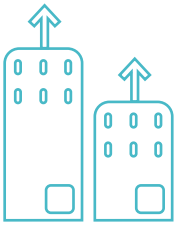
Invest in Solutions

Support for People

Invest in tax rebates for low-income families and incentives for buying cleaner vehicles and other energy-saving technology.

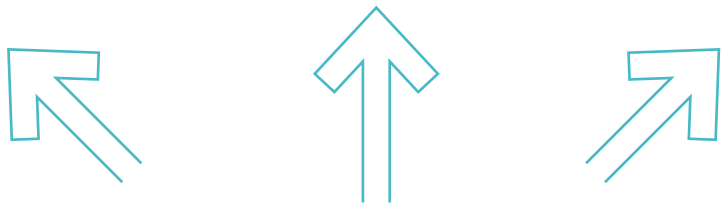
Competitive Businesses

Help B.C. businesses adapt and foster new, cleaner industries.



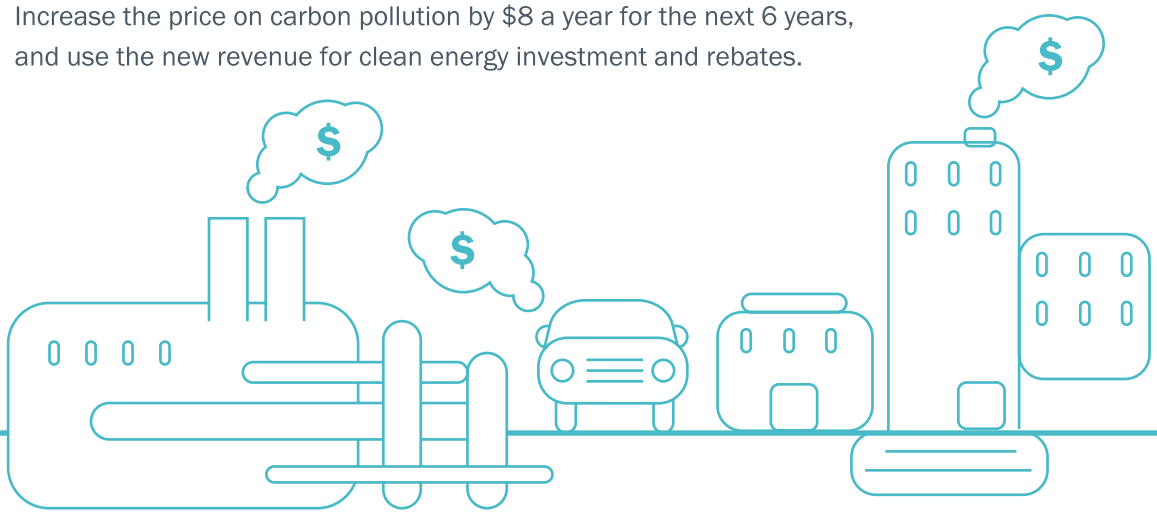
Clean Infrastructure

Invest in transit and transmission infrastructure to keep people moving and clean electrons flowing.



Reliable Funding

Increase the price on carbon pollution by $8 a year for the next 6 years, and use the new revenue for clean energy investment and rebates.



From software developers to financial analysts to restaurant workers – people with a wide variety of skills will find new opportunities in a future where B.C. also meets its climate goals.

Background: A chef and his team plate meals at the Vancouver Convention Centre. Photo: Vancouver Convention Centre, Flickr.
Back: James Wheeler, Flickr.

A Clean Economy and Jobs Plan for British Columbia: Building a Diverse and Prosperous Economy Through Climate Leadership

By Jeremy Moorhouse, James Glave and Julia Kilpatrick
October 2015

Clean Energy Canada (cleanenergycanada.org) is a climate and energy think tank housed at the Centre for Dialogue at Simon Fraser University. We work to accelerate our nation’s transition to a clean and renewable energy system.

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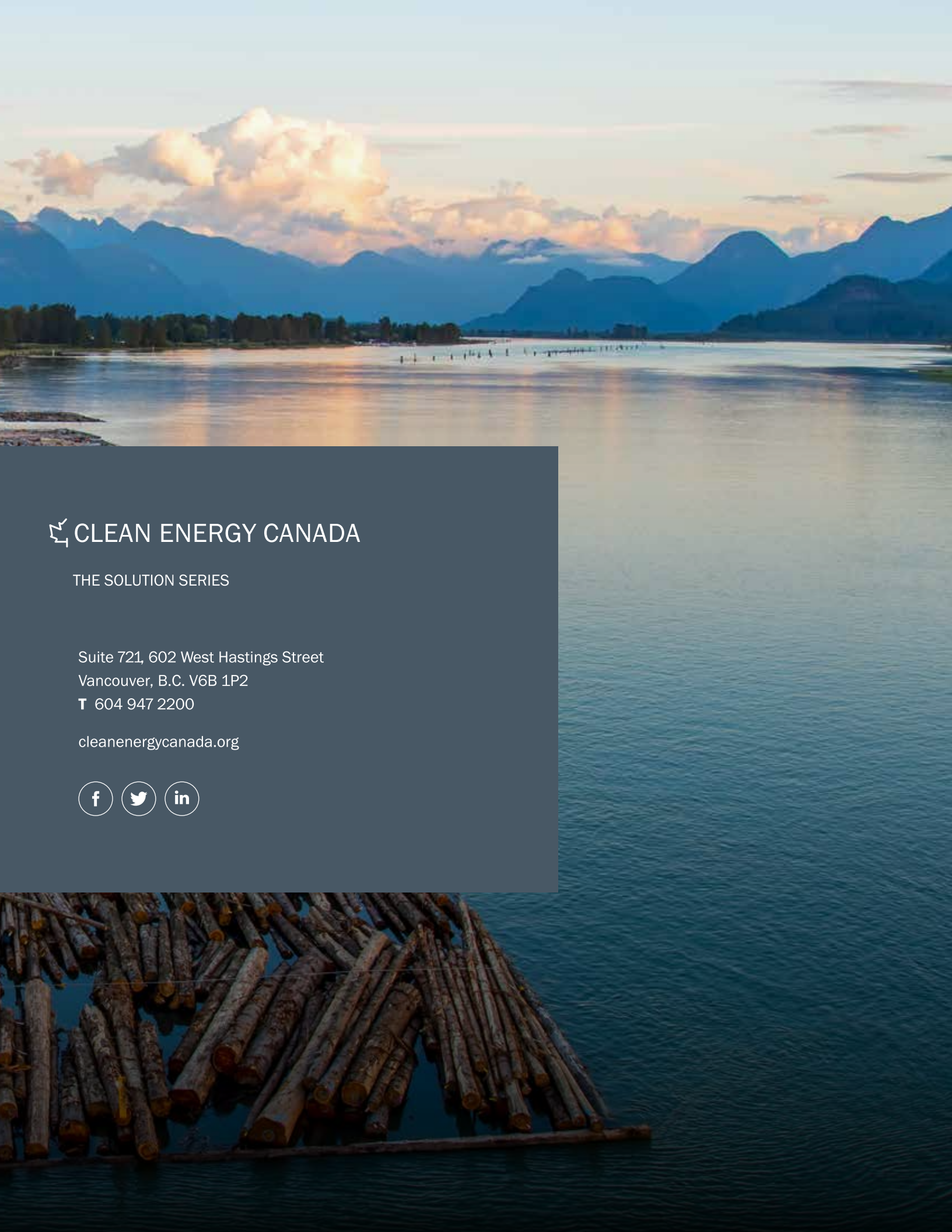

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