

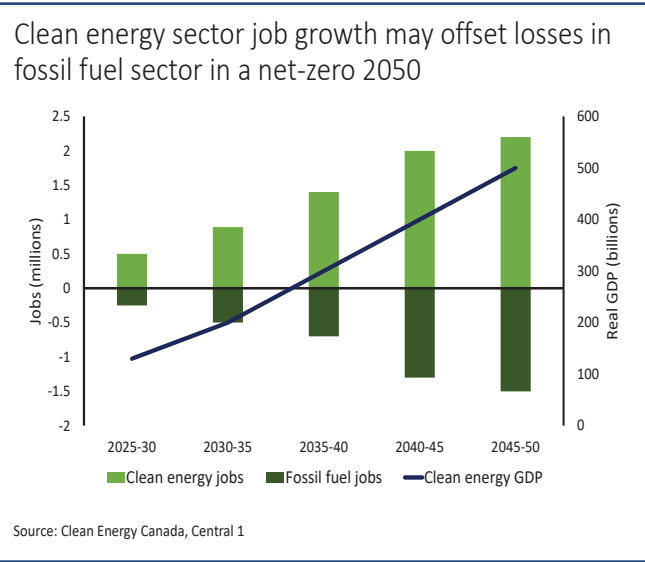


### Canada's Clean Economy

The push for clean energy has been loud in Canada with concerns about climate change echoed across the country. While the Canadian clean sector currently accounts for a relatively small share of the economy, there are hopes for its accelerated growth in the coming years with increasing efforts by the government to meet climate goals by 2050.

The Canadian government has made commitments to address climate change and greenhouse gas emissions for decades, beginning in 1990 and through to 2016's "Pan-Canadian Framework in Clean Growth and Climate Change", 2020's "A Healthy Environment and a Healthy Economy" and 2022's "Canada's 2030 Emissions Reduction Plan". All plans outline ways to reduce carbon emissions, meet environmental goals and support Canadians through the transition to a clean economy while securing long term jobs. According to the Environmental-Economic account produced by Statistics Canada, economic growth outpaced industrial greenhouse gas emissions from 2009 to 2021, with the economy growing by 2.0 per cent per year on average while emissions decreased 0.2 per cent per year on average during this period.

The incentive to reach Canada's net-zero targets are strong given the resulting socio-economic benefits which may include a considerable boost to Canada's GDP, job creation, and broader human welfare gains. According to research done by Clean Energy Canada and Navius Research, jobs in Canada's clean energy sector are forecasted to grow 7 per cent per year, from 509,000 in 2025 to 2.7 million in 2050 if net-zero targets are met. It estimates that a 2.2-million gain in clean jobs would more than offset the 1.5-million job loss expected in fossil fuels sectors. Findings from the same research show the real GDP of the clean energy sector would increase to become six times larger in a net-zero 2050 compared to 2025, while that of fossil fuels would halve. The result is that Canada's clean energy sector in 2050 would be worth 63 per cent more than Canada's fossil fuel sector in 2025, even after inflation.

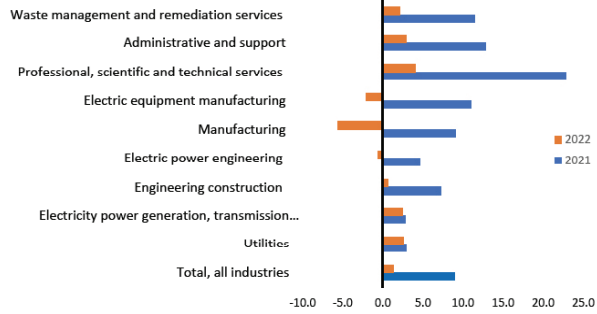


### What makes up the clean energy sector?

At the moment, Canada's clean energy sector is made up of companies that aim to reduce carbon pollution, be it by generating clean energy, which is derived from renewable sources without pollutants, reducing energy consumption, or developing low-carbon technologies. The Environmental and Clean Technology Products Economic Account (ECTPEA), which measures economic variables in the clean technology sector, recorded a 22.0 per cent jump in real GDP as of 2022 compared to 10 years ago. That said, year-over-year growth in the sector has slowed in recent years, with real GDP in the sector up by 1.9 per cent in 2021 and slowing to 1.2 per cent in 2022, below pre-pandemic levels. This was also a paltry performance when held against the backdrop of the Canadian economy, which grew by 3.9 per cent in 2022. Ontario and Quebec contributed the largest to the sector, accounting for 34.3 per cent and 30.0 per cent of the sector's GDP respectively during the year, while B.C. contributed 14.7 per cent to the total amount.

### Employment growth seen in several subsectors in the clean energy economy

Employment Change between 2020/2021 and 2021/2022, per cent

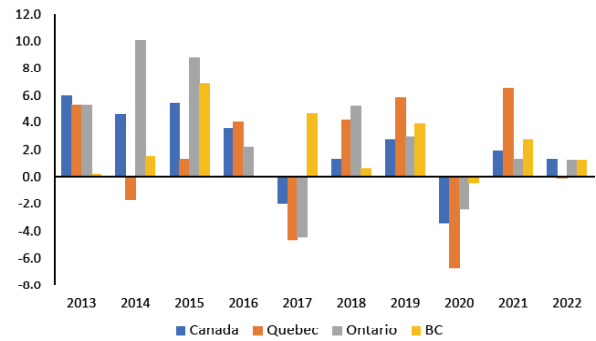


Source: Statistics Canada, Central 1

latest: 2022

### Growth in Canadian clean environmental products and services slows in 2022

Growth rate of Real GDP Environmental and Clean Technology Products and Services, per cent



Source: Statistics Canada, Central 1

latest: 2022

About 327,506 jobs were found in the sector in 2022, a 1.3 per cent increase from 2021 and represented 1.6 per cent of all jobs in Canada during the year. A lot of progress will need to be made between now and 2050, as this is only 0.1 per cent of the projected number of jobs in the sector if net zero goals are met (2.7 million). Growth in wages in the sector (up 5.3 per cent to \$101,595) outpaced average economy-wide wage growth (up 4.5 per cent to \$72,633) during the period. In terms of international trade, the export volume of environmental and clean technology products fell by 2.3 per cent in 2022 and manufactured goods accounted for more than half of the value of these exports. Import volume rose 7.9 per cent during the same period.

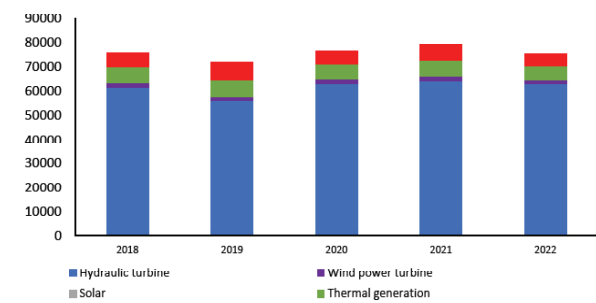
As of 2022, renewable energy sources accounted for just 16.9 per cent of Canada's total primary energy supply. Given Canada's competitive advantage in renewable energy production due to its geography and vast landmass, there is still room for improvement and immense opportunities to be seized as the clean economy grows. The requirement for new fuel sources has become more paramount in recent years as Canada's population multiplies.

While total electricity generation is mainly from hydroelectric sources in Canada (61 per cent in 2022), electricity generation is derived from varied sources across Canada's provinces. Nuclear energy serves a key role in electricity provision in Ontario, majority of Prince Edward Islands supply comes from wind, while in B.C., Manitoba, Quebec and Newfoundland and Labrador, hydroelectric sources account for a great proportion of their electricity source. Some provinces remain reliant on fossil fuels, such as Alberta, Saskatchewan, Nova Scotia, and New Brunswick.

In B.C. in particular, CleanBC was created to focus on the provinces' clean economy goals. So far, progress has been recorded although more recent data is needed to gauge the current situation. In 2021, greenhouse gas emissions were reduced by 3.0 per cent compared to emissions in 2007 while been down 6.0 per cent from 2018, the start of CleanBC<sup>1</sup>. The CleanBC Roadmap to 2030<sup>2</sup> released in 2021 set interim goals to reduce emissions to 16 per cent by 2025, limit emissions to 40 per cent by 2030 and 100 per cent of emissions target to be met by 2050 and in so doing expand the economic opportunities in the clean energy sector in B.C.. As part of the plan, B.C.'s carbon tax applied to the purchase and use of fossil fuels rose from \$65 to \$80 per tonne in April 2024.

### Hydroelectricity generation main source of electricity in B.C.

Gigawatt hours



Source: Statistics Canada, Central 1

latest: 2022

Hydroelectricity serves as main source of electricity in B.C. and with lines connecting to other areas in Western North America, B.C. is usually a net exporter of electricity. The province can obtain electricity from the U.S. when prices are lower and resell when prices are higher, usually

1 2023 Climate Change Accountability Report - CleanBC

2 Roadmap to 2030 - CleanBC

resulting in a positive trade balance. Biomass is the second largest source of electricity generation, while other sources include solar and wind.

Ontario is one of the provinces that has taken many strides in moving towards a greener economy. One of these steps is being the first province to phase out coal-fired electricity. Nuclear power generation in the province has assisted in the transition towards a non-emitting electricity grid. Ongoing construction at Ontario Power Generation's Darlington site will be home to the country's first grid scale small modular reactor (SMR) and will provide low emissions electricity regardless of weather conditions and with reduced land usage<sup>3</sup>.

Key initiatives and credits to incentivize cleaner energy use have been successfully implemented in the province. For example, Natural gas conservation programs have produced a significant reduction in climate-changing emissions while Ontarians have been able to reduce their bills. Other energy sources will also continue to play a role in decarbonizing the province. Late 2023, the Independent Electricity System Operator announced procurement of more wind and solar power to address growing energy needs in Ontario.

### ***Challenges bringing on opportunities for growth***

A greener economy, though vital for sustainable economic growth, does not come at zero costs. For example, transition risks arise from the imposition of tight regulations on different industries. Companies may face more challenges, especially those in energy-intensive sectors, as they navigate and adapt to changing climate-favoring regulations. Emissions cap and carbon taxation may lead to higher costs for businesses, which may then be passed on to consumers. Also, these regulations may prompt a severe dip in production which would in turn lead to job losses. The potential job losses in the oil and gas industry may pose several issues for the economy and disincentivize investments by companies. A well-coordinated transition to a cleaner economy may entail motivations such as tax incentives, subsidies for clean technology usage and other considerate policies to mitigate risks to businesses and aid them in adopting sustainable production processes.

### ***Addressing alternatives***

Clean energy initiatives built around the abundant supply of hydroelectric power as a main alternative to fossil fuels have been called into question with doubts about the longer-term ability of hydropower to continue as a major source for electricity supply. According to the Canadian Climate Institute, approximately 1.3 to 2.6 times more electricity generation and 1.8 to 2.9 times of capacity is needed to reach net zero goals. Climate change has not only impaired the ability to predict future climate patterns and forecast energy supply and demand but has also made it more difficult to generate hydropower since severe drought conditions have been more common recently. Escalating conditions during the record-breaking fire season mid-2023 also contributed to calls for quicker switching to cleaner energy sources.

At the same time, work is needed to mitigate potential damages of climate change as Canadian households will also be impacted as the physical risks to communities and uncertainty around climate change intensifies. Insured damage costs by severe weather reached \$3.1 billion in 2023, marking the fourth worst year for insured damage in Canada<sup>4</sup>.

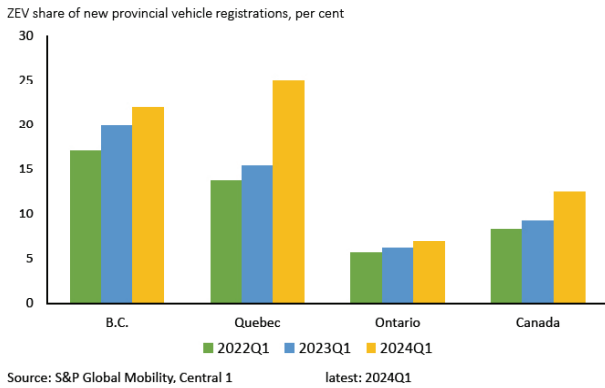
The decarbonization of the transportation sector is important in the country meeting its climate goals and expanding electric vehicle usage throughout Canada may be a key solution. According to an S&P Global Mobility report, 1 in 8 vehicles registered in Canada in first quarter of 2024 were zero emission vehicles (ZEVs). Quebec had the highest ZEV adoption rate in the country as they accounted for 25 per cent of new vehicle registrations in the province, compared to 21.9 per cent in B.C. and 7.0 per cent in Ontario. In 2022, the Canadian government put forth proposed regulations and requirements for manufacturers and importers to meet annual ZEV sales targets and to ensure that increasing consumer demand is met by adequate supply. The new proposal requires 100 per cent of all new light-duty vehicles sold be ZEVs by 2035.

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<sup>3</sup> The Climate Catalyst: Ontario's Leadership In The Green Global Economy - Ontario Chamber of Commerce

<sup>4</sup> Severe Weather in 2023 Caused Over \$3.1 Billion in Insured Damage - Insurance Bureau of Canada

### Growth in provincial ZEV market share highest in Quebec in first quarter of 2024



This being said, concerns about the costs of owning electric vehicles still linger in the minds of some Canadian consumers as they grapple with higher costs of living and rising mortgage costs. The lifetime cost of owning an electric vehicle is typically lower than gas-powered vehicles due to saving on fuel prices and maintenance costs. However, the upfront cost of an electric vehicle is still much higher and serves as a barrier to purchase. In addition, the extra expenses related to setting up and operating an electric vehicle charging system in-house may make owning an EV less appealing. The government and EV manufacturers will need to continue working together to address issues surrounding EV affordability and charging station infrastructure. Currently, there are federal and provincial rebate programs supporting

Canadians who decide to purchase ZEVs. Incentives programs coupled with education about the benefits of owning ZEVs may promote their adoption further.

Canada’s electric vehicle battery supply chain may provide about 250,000 jobs and generate \$48 billion for the economy by 2030<sup>5</sup>. With the growth in the popularity of electric vehicles, untapped opportunities may exist to utilize Canada’s metals and minerals in the manufacturing process. In the Federal Budget 2024, a new 10 per cent electric vehicle supply chain investment credit is offered to build important portions of these vehicles, including assembly and battery production. In addition, upcoming projects in B.C. include a \$1 billion lithium-ion battery cell manufacturing facility being constructed by battery company E-One Moli which was announced in November 2023. It will be funded by the Government of Canada with a contribution of \$204.5 million through the Strategic Innovation Fund’s Net Zero Accelerator Initiative, a fund designed to invest in new clean energy opportunities as well as aiding industries in the transition to a net-zero economy. Also, Ontario is a major vehicle manufacturing hub in North America, with major car manufacturers situated in the province, and a key location for EV battery manufacturing. Earlier in 2024, Honda Canada announced a \$15 billion project to create a comprehensive electric vehicle supply chain in Ontario, the first of its kind in Canada. In addition, Volkswagen is investing \$7 billion to build an electric vehicle battery manufacturing plant by 2027 in Ontario, which will hope to create 3,000 direct jobs and up to 30,000 indirect jobs while generating about \$200 billion in value<sup>6</sup>.

### ***Making the transition possible***

With government programs tailored to assist households as cleaner in-home practices become more popular, financial institutions such as credit unions could play a crucial role in supporting communities through the shift to a clean economy. This may entail the provision of green financing and widening commercial services which offer loans and investments for sustainable projects.

The government estimates \$125-140 billion will be needed annually to reach net-zero goals by 2050. An inaugural \$5 billion green bond was issued in Canada in 2022. This saw strong demand with a final order book of more than \$11 billion while foreign investors seeking green investment opportunities purchased almost half of the issuance and represented 70 per cent of buyers. 39 per cent of proceeds were allocated through mostly grants and loans to clean transportation while the remainder was spread amongst other categories including renewable energy, “living natural resources & land use”, sustainable water and wastewater management and climate change adaptation.

In all this appears the need for aid from financial institutions to raise much-needed capital. The private and public sectors have a major role to play in promoting investment in renewal energy technology/strategies. The relationship between financial efficiency and renewable energy investment is important and public investment alone is insufficient to deploy new renewable energy projects since investment in clean energy is more expensive than conventional energy investments.

5 Canada’s New Economic Engine - Clean Energy Canada

6 Volkswagen’s New Electric Vehicle Battery Plant Will Create Thousands of New Jobs

Ontario has led the provinces as the largest issuer of Canadian dollar green bonds. So far, there have been sixteen green bonds issued by the province reaching a sum of \$19.3 billion with more than \$17 billion still outstanding. It produced a sustainable bond framework with which it can issue Green bonds, Social bonds, and Sustainability bonds, each providing support and financing for environment and socially beneficial projects.

Climate change is a pressing global issue and quicker action is required to mitigate its impact. Further to making plans to meet climate objectives set by the government, simplifying regulatory processes to license projects which contribute to the clean economy is needed so these targets are achieved on time. The end goal for a decarbonized, clean economy is an inevitable one and it is not a one-man job. From consumers adopting greener practices in their day-to-day lives to businesses embracing greener production processes, joint effort from multiple stakeholders is imperative. A viable transition will materialize as provincial and federal governments find an efficient balance between economic output and environmental protection through creative policymaking. Although incentives already exist for impacted households and businesses, more of these are necessary as we get nearer to 2050.

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