



# Québec successful



# Highlights

1 Québec is the North American state with the lowest GHG emissions per capita.

2 Québec has set a goal to reduce its GHGs by 37.5% compared to 1990 by 2030 and achieve carbon neutrality by 2050. It has tabled its plan for a green economy, which contains concrete and bold measures as well as investments of \$6.7 billion.

3 Québec has projects to increase access to public transit and electric transport modes amounting to \$55 billion over the next 10 years.

4 Québec recently entered into clean electricity export contracts with Massachusetts and New York. The contract with New York is the equivalent of removing emissions from 44% of the cars on New York City's streets.

5 Thanks to its Crown corporation, Hydro-Québec, Québec has clean energy surpluses available for companies that wish to set up operations in Québec.

6 Québec is committed to developing the electric bus sector with companies such as Lion and Nova Bus.

7 Québec is working on the electric train sector with Alstom-Bombardier.

8 Québec is developing a complete ecosystem, from mining to design, in order to produce one of the world's cleanest electric batteries and become a major international green battery supplier.

9 Québec is actively developing the green hydrogen sector with Hydro-Québec.

10 Québec and California are the only two North American states listed on a carbon exchange (WCI Western Climate Initiative). Discussions are underway to add other US states and Canadian provinces to this market.

11 Québec has just announced the termination of hydrocarbon extraction in its territory.

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# Québec successful

The fight against climate change is not only a priority for Québec, it is also one of its great strengths. As a leader in clean energy production and electrification, an emerging player in the battery and green hydrogen industries, and a pioneer among states in terms of carbon pricing, Québec is already a successful player in this area.

To accomplish these successes, Québec is building on one of its greatest resources: hydroelectricity. **Our ambition is to become the green battery of Northeastern America!**

We are at the forefront and we intend to stay there. Through its **2030 Plan for a Green Economy**, Québec is continuing to set ambitious targets in addition to establishing strategic alliances with its international partners. We have a wealth of assets to promote: our vast reserves of clean, affordable energy, our deposits of strategic minerals such as lithium and nickel, our know-how in the carbon market sectors and our expertise in green technologies, green aluminum, electric transportation and green hydrogen. Québec is the best place in the world for investing in the green economy!

Québec emits fewer greenhouse gases per capita than any other state in North America and became a trailblazer by integrating a price on carbon into its economy. It also contributes to the energy transition of its neighbours through hydropower export projects, particularly in Massachusetts and New York State. Our goal is no less ambitious: reduce our greenhouse gas emissions by **37.5%** below their 1990 levels **by 2030** and achieve carbon neutrality by 2050.

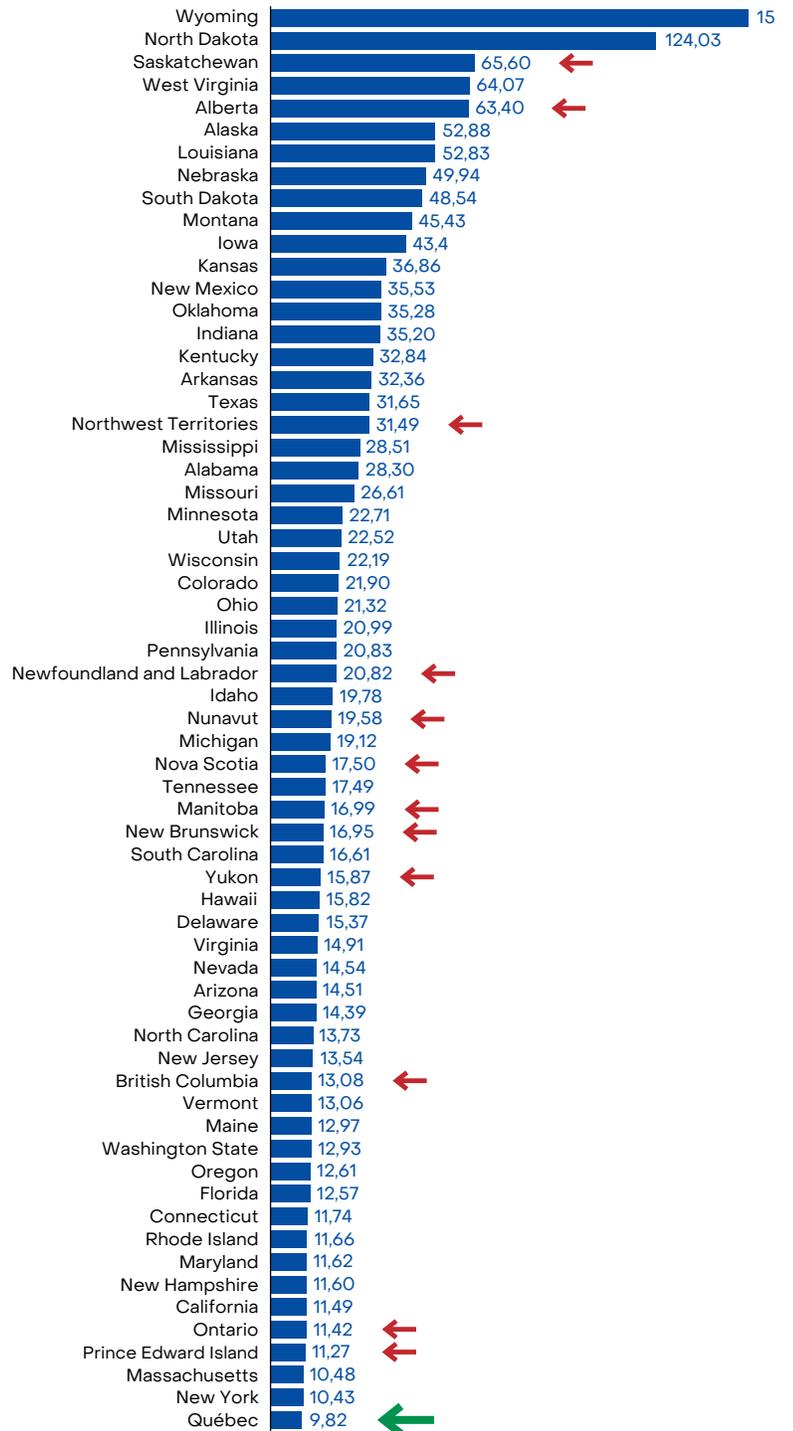
# GHG ranking per capita in North America

Québec is the only territory in North America whose per capita greenhouse gas emissions in 2018 were less than 10 tonnes of CO<sub>2</sub> equivalent per capita, ranking it first among Canadian provinces and US states.

**SOURCES:**

- **For Canada:** National Inventory Report 1990–2019: Greenhouse Gas Sources and Sinks in Canada.
- **For the United States:** CAIT data: Climate Watch. 2020. GHG Emissions. Available at: [climatewatchdata.org/ghg-emissions](https://climatewatchdata.org/ghg-emissions).

## Greenhouse gas emissions per capita in Québec, Canadian provinces and territories and US states



# Hydro-Québec: collective wealth benefitting the green economy

Today, hydroelectricity is Quebecers' greatest collective wealth. But that has not always been the case. Until the 1940s, Québec's water resources were controlled by private monopolies.

In 1944, the Québec government made a bold move by entrusting water resource management to a Crown corporation: the Québec Hydroelectric Commission. **On April 14 of the same year, Hydro-Québec was created.**

In June 1960, the government gave Hydro-Québec the exclusive mandate to develop and operate rivers that were not yet conceded to private interests.

Nationalization was achieved within a few years. Hydroelectricity, Québec's blue gold, now belonged to all Quebecers.

Today, Hydro-Québec has 4.4 million customers and 261,578 km of transmission and distribution lines. This Crown corporation plays a decisive role in Québec's economic development owing to the scope of its investments and expertise as well as its ability to produce large quantities of low-cost clean electricity.



## Québec: a leader in the electrification of the North American economy



As the world's fourth largest producer of electricity, Québec has world-renowned expertise and a reliable, safe electrical grid. It is an undisputed leader in hydroelectric generation, power transmission and renewable energy integration.

In recent years, wind energy has also developed rapidly in Québec and is now showing significant growth potential. Currently, more than 99% of the electricity produced in Québec is derived from clean energy sources, **making it the leading renewable energy producer among all North American states.**

Overall, Québec's energy supply is one of the world's cleanest. It compares favourably with that of countries like Iceland and Sweden.

Québec can also boast of having some of the most competitive electricity rates in North America. The cost of electricity in Québec is also, on average, **49%** lower than in the G7 countries. This has allowed several industries to thrive and maintain low production costs while generating low carbon emissions. Québec is the ideal home for businesses that want access to clean, affordable energy.

The Québec government has also been working for decades in close collaboration with Indigenous communities to plan hydroelectric projects that respect their culture and traditions.

With our 62 hydroelectric plants, we're proud to say that our energy is more than 99% clean. We want to continue to support our partners in achieving their own climate objectives by exporting our hydroelectricity and to become the battery of Northeastern America.



## **An ally in electrifying the Northeastern United States**

For over a century, Québec has been a supply source of clean, reliable and affordable electricity for the United States. In 2020, Québec exported more than **23 TWh** of electricity to the New England states and New York.

Now more than ever, Québec is a partner of choice for its neighbours wanting to achieve their energy transition and electrify their economies. A clear indicator of that came in September 2021 when New York State chose Hydro-Québec to provide it with **10.4 TWh** of clean energy for the next 25 years. That amount of energy represents the energy consumption of about one million homes. Currently, fossil fuels meet 85% of New York City's energy needs. The Champlain Hudson Power Express (CHPE) project is the largest export contract in Hydro-Québec's history. It equates to removing **44%** of the emissions from vehicles on New York's streets. This is a major contribution to the electrification of the Northeastern United States and, more broadly, to the global fight against climate change.

Hydro-Québec was also selected by Massachusetts in 2017 to deliver **9.45 TWh** over a 20-year period in conjunction with New England Clean Energy Connect (NECEC), **New England's largest clean energy project.**

# Québec: a successful player in the fight against climate change

The 2030 Plan for a Green Economy (2030 PGE) is Québec's first-ever framework policy on climate change. The plan was launched in 2020 and has become Québec's primary tool for responding to the climate emergency. The 2030 PGE demonstrates Québec's intention to continue implementing the Paris Agreement and makes the approach consistent with the global effort. Québec has committed to reducing its greenhouse gas emissions by **37.5%** below their 1990 levels and achieving carbon neutrality by **2050**.

The 2030 PGE focuses on bold and innovative interventions that go beyond what has been done so far: concrete measures and major investments of **6.7 billion dollars through 2026**, an annual financial outlay to fight climate change that is twice as large as in the past.

The government wants to make the fight against climate change a major lever for economic development and international influence. It will place emphasis on the electrification of the economy and the development of other renewable energy sources, as well as on economic sectors of the future. These initiatives will enable Québec to participate in the effort to reduce greenhouse gas emissions beyond its borders, in particular by increasing its electricity and clean technology exports.

Our goal is to have **electric vehicles account for 100% of automobile sales by 2035**. The sale of gasoline-powered vehicles will be prohibited. Québec has set a target of putting 1.5 million electric vehicles on its roads by 2030, which will correspond to about 30% of the automotive fleet.

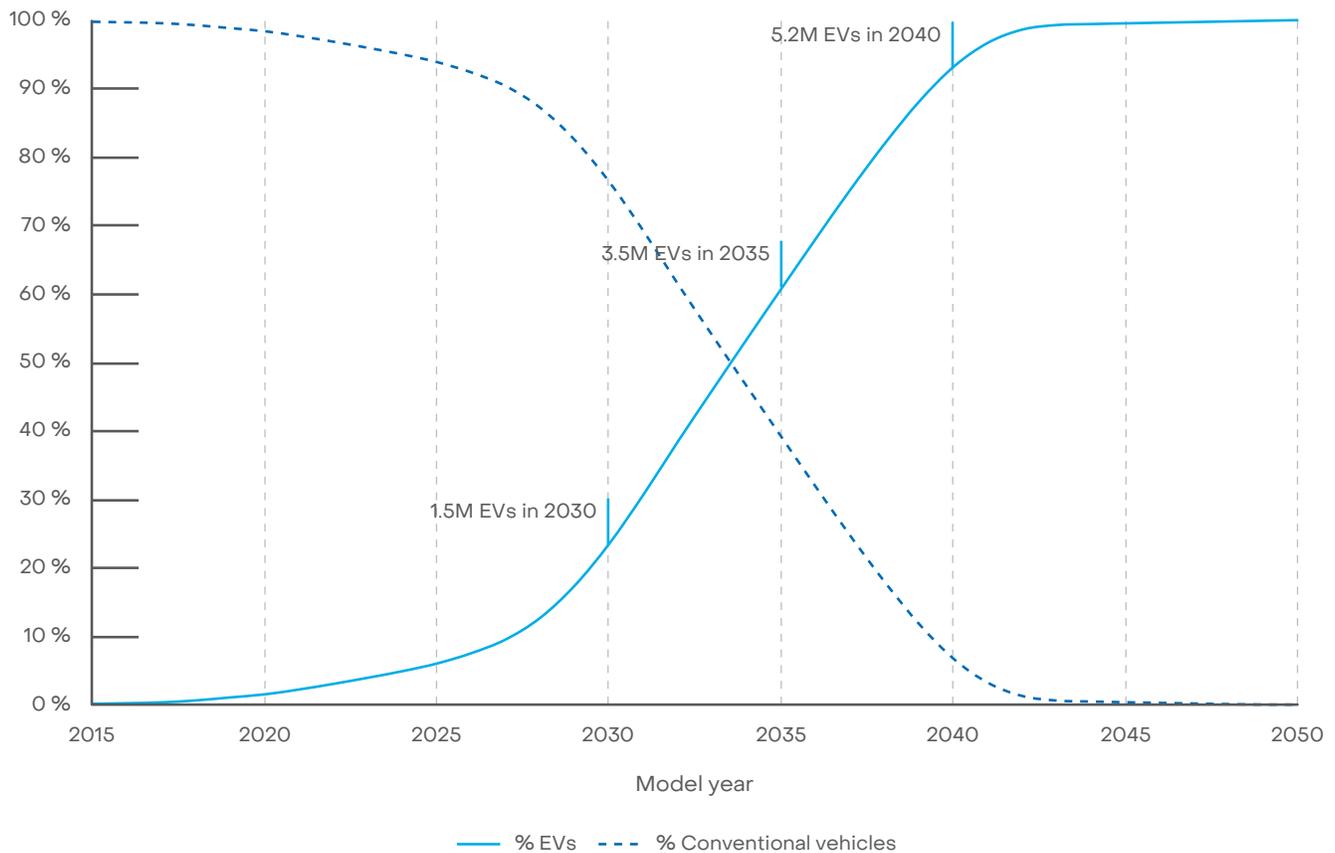


The Québec government intends to put an end to hydrocarbon development in Québec. A bill to that effect will be tabled shortly.

The carbon market also plays a role in achieving the target by contributing to reductions in industries that account for 80% of our emissions.

The collective efforts that must be made in the coming months and years are considerable. Reports published by the International Panel on Climate Change (IPCC) are unequivocal on this subject. They clearly indicate that the impacts of climate change will be increasingly significant and the economic and human costs associated with those impacts will increase rapidly. Québec is going to do its part to address this major challenge.

### Evolution of the vehicle fleet composition in Québec by 2050



SOURCE: Ministère de l'Environnement et de la Lutte contre les changements climatiques

## Québec's expertise for developing electric transportation



Québec is staunchly committed to transportation electrification and is already a leader in terms of both electric vehicles (EVs) and infrastructure. Nearly **45%** of the EVs in Canada are in Québec.

Québec is the ideal place for investors wanting to advance the electric vehicle industry, notably through the recognized know-how of its businesses and research centres, its abundance of critical minerals and clean energy, and its numerous financial assets, such as competitive energy rates and operating costs.

Québec is in the process of establishing a complete value chain that fosters the growth of transportation electrification, ranging from research to mining production and the manufacture of components, particularly batteries.



Québec's electric vehicle industry comprises world-renowned companies that are open to business proposals. These companies include **Bombardier-Alstom**, **Lion Electric Company**, **Micro Bird Corporation**, **Prévost**, **Nova Bus** and **Taiga Motors**. Other companies in the transportation sector, such as **Bombardier Recreational Products** and **Demers Ambulances** are pursuing advanced electrification projects.

A number of projects by companies in this sector are underway. For example:

- › The **Lion Electric Company** is building a battery pack assembly plant in Mirabel. The project is valued at **\$185M** and has been granted a government loan of up to \$50M.
- › **Taiga Motors** is setting up a plant to manufacture watercraft, snowmobiles, electric drive systems and battery packs in Shawinigan. The project, valued at approximately **\$125M**, has been granted a government loan of up to \$30M.
- › The **Innovative Suppliers of Electric Mobility** mobilizing project aims to develop new product lines in electric power for the electric truck market. The **\$28M** project has been granted \$14M in support and is being carried out by three companies: **Dana Laval ULC, Dana-TM4** and **Spectra Premium**.
- › The mobilizing project **to integrate equipment and technology into specialized heavy electric vehicles** aims to develop ambulances, dry cargo or refrigerated freight trucks, mobile workshops, two models of bucket trucks, and refuse trucks. This **\$15.8M** project has received \$7.9M in funding. Seven partners are participating in it:
  - Boivin Evolution;
  - The Lion Electric Company;
  - Demers Ambulances;
  - Fourgons Transit Inc.;
  - Maximetal;
  - Posi +;
  - PRAN Systems.

These are not the only initiatives the government is taking to strengthen the industry. The Ministère de l'Économie et de l'Innovation (MEI) is providing **\$50M** over the next five years to support the development of new transportation electrification products and the battery recycling sector.

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## Example of companies and their electrification products

### **Bombardier-Alstom**

- AGC battery-powered trains
- Full range of electric passenger transport train cars such as metro cars, passenger trains, airport shuttles, tramways

### **The Lion Electric Company**

- All-electric class 6 and 8 trucks
- School buses (C and D) and mini school buses (Lion M)

### **Nova Bus**

- Nova Bus LFS HEV, Nova Bus LFSe, Nova Bus LFSe+

### **Girardin and Micro Bird**

- G5 Minibus

### **Taiga Motors**

- Ekko (mountain), Atlas (crossover) and Nomad (utility) snowmobiles
- Orca watercraft

### **Exprolink**

- Sidewalk sweepers

### **Phaneuf International**

- Ice resurfacers

### **Ecotuned**

- Electric conversion systems for light and medium weight trucks

### **Motrec**

- Electric industrial vehicles

### **Bombardier Recreational Products**

- E-concepts (Sea-Doo, Ryker and Rotax Sonic E-Kart)
- Rotax modular electric powerpack technology

### **Demers Ambulances**

- Demers eFX ambulance

### **Kargo**

- Industrial mini-trucks, all-electric low-speed vehicles

### **Posi +**

- Hybrid bucket trucks

### **Wattman Trains and Trams**

- Trains, shuttles designed to transport people at amusement parks

### **In Québec, we're connected to the future.**

Thanks to the recognized know-how of our companies and research centres, and our competitive energy rates and operating costs, we're the best place in the world for investing in the electric vehicle industry.

## Modern public transportation

Québec intends to invest **\$12.8 billion by 2031** to increase access to public transit and electric transportation modes for an investment potential of **\$54.9 billion over ten years**.

Five major projects are underway:

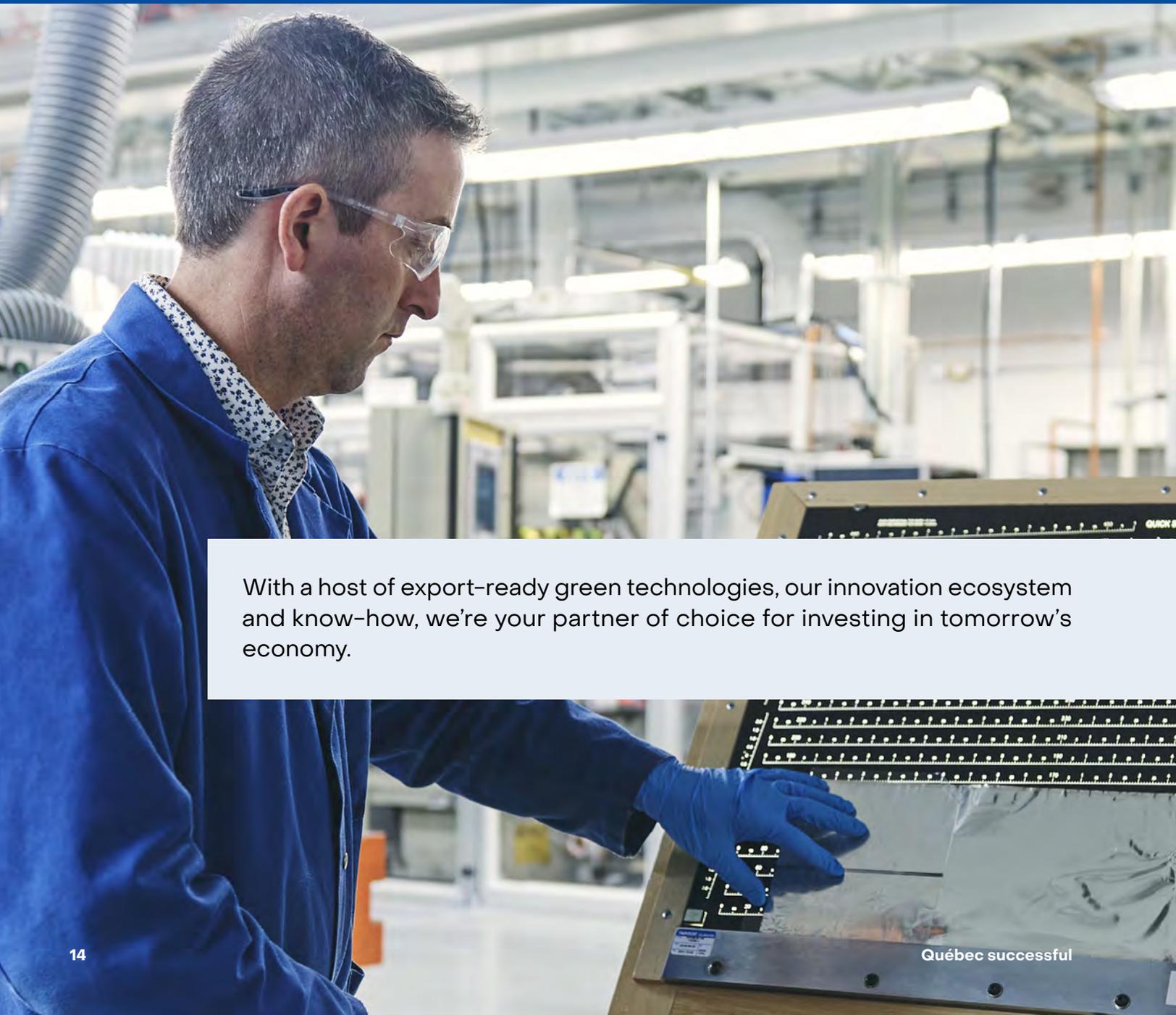
- › The Réseau express métropolitain (REM) in Montréal will become the largest public transit project to be completed since the construction of the Montréal metro. It consists of an automated light rail system with **26 stations over 67 km** connecting downtown, the airport and the Montréal metropolitan area. Its operation is expected to be phased in gradually starting in spring/summer 2022 and ending in late 2024.
- › The Réseau express métropolitain de l'Est (REM de l'Est), consisting of a new **32 km** light rail network with **23 stations**, will connect Montréal's east and northeast and substantially improve the public transit offer.
- › The government's vision for public transit in the Québec City metropolitan area, the Réseau express de la Capitale (REC), focuses on two travel routes (north-south and east-west) and the complementarity of four major public transit projects that will be deployed in the regional territory over a ten-year horizon.
- › The project to extend the Montréal metro's blue line includes the addition of five stations over a distance of **5.8 km**. The project will support urban and economic development in East Montréal and improve mobility in the metropolitan area.
- › The structuring electric public transit project between west Gatineau and downtown Ottawa will connect west Gatineau, downtown Gatineau and downtown Ottawa by a tramway system stretching over approximately **26 km** on two routes. The project will foster sustainable mobility and linkage with Gatineau's public transit network.



# The cleanest battery in North America



Québec has unparalleled assets for producing one of the world's cleanest electric batteries. To fulfill its ambitions of becoming a major global supplier of green batteries, Québec is currently developing a complete ecosystem, from mining to design and including the manufacture of key components and end-of-life management of batteries.



With a host of export-ready green technologies, our innovation ecosystem and know-how, we're your partner of choice for investing in tomorrow's economy.

Québec offers a sustainable alternative to international partners looking to invest in a safe and reliable supply of critical and strategic minerals. Québec's booming electric battery ecosystem can rely, in particular, on:

- A subsoil rich in strategic minerals, such as lithium, nickel, graphite and cobalt;
- Working mines and major development projects;
- The implementation of several projects involving first-stage battery material processing;
- Clean, abundant and affordable electricity and an advantageous business environment for the manufacture of battery components;
- A cutting-edge battery research sector, with more than **850 patents**;
- Competitive access to the North American market thanks to numerous international trade agreements and rail or road access to **more than 65%** of North America's battery cell factories;
- Expertise for producing electric vehicles locally;
- Geographical proximity of collection infrastructure that makes it possible to recover raw materials at a competitive cost;
- Local technologies for recycling **95% of end-of-life battery materials** for reuse.

## Green hydrogen: at the forefront of tomorrow's economy

Thanks to the abundance of its hydroelectric resources, Québec is fortunate to be one of the few states in the world capable of producing green hydrogen by water electrolysis at a competitive price.

Energy efficiency and direct electrification are core solutions for succeeding in the energy and climate transition, but they will not suffice to replace all fossil fuels. In the coming decades, green hydrogen and bioenergy will have to play an increasing and complementary role to that of electricity in decarbonizing sectors that emit the most GHGs.

Québec has incomparable assets for developing these sectors, including diversified biomass sources and clean electricity at a competitive cost.

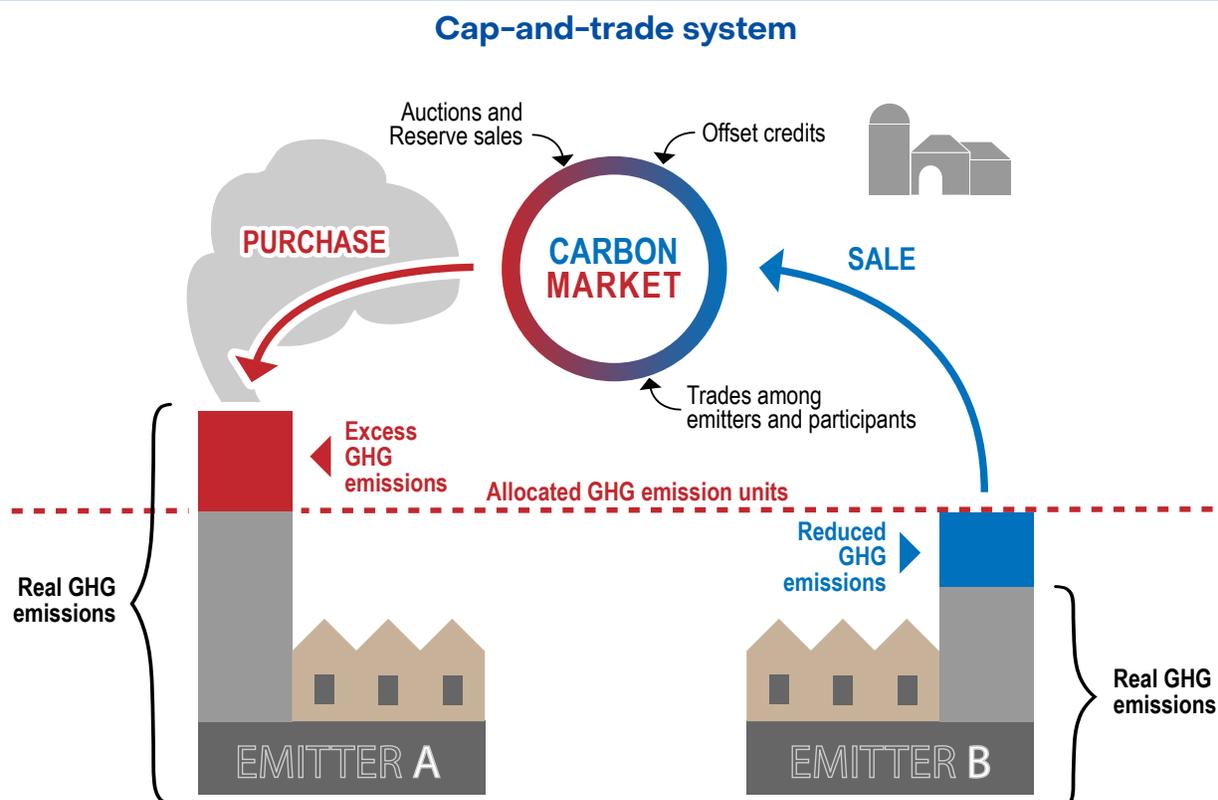
Hydro-Québec will serve as a strategic partner by meeting the energy demand associated with developing the green hydrogen sector. It will also play a key role in developing the industrial ecosystem and will be in a position to leverage its research and development resources as well as its expertise and know-how in the renewable energy sector. Many projects are already in preparation or underway:

- Hydro-Québec is a partner in the construction of an electrolyser for green hydrogen production as part of a cellulosic ethanol production project in Varennes led by Enerkem;
- Air Liquide has put a **20-megawatt** electrolyser into operation to produce green hydrogen in Bécancour;
- A pilot project on fuel cell electric vehicles is underway in Québec City with the addition of some 50 vehicles to the government fleet. The vehicles are refueled at Québec City's very first hydrogen filling station, which is accessible to the public.

# The carbon market: a tool for green economic growth

Québec is a pioneer in North America when it comes to the carbon market. As early as **2007**, it set a price on carbon through a levy on fossil fuels. Québec's strength lies especially in its ties with other states. In **2014**, Québec partnered with California to form what is now the largest carbon market in North America. Québec continues to exercise leadership with other governments interested in the advantages of this market.

The functioning of Québec's carbon market is considered exemplary by the Secretary-General of the Organisation for Economic Co-operation and Development (OECD).



SOURCE: Ministère de l'Environnement et de la Lutte contre les changements climatiques

Québec is leveraging its carbon market to reduce the GHG emissions of companies and, through the revenue it generates, help Québec society's energy and climate transition.

It reinvests all revenue from this market in measures to combat climate change. Carbon market revenue will continue to help in the fight against climate change beyond 2020 by funding the Plan for a Green Economy over the next 10 years.



Québec shares its carbon pricing expertise within several international organizations, including the OECD, World Bank, Carbon Pricing Leadership Coalition, International Carbon Action Partnership and Collaborative Instruments for Ambitious Climate Action Initiative of the United Nations Framework Convention on Climate Change (UNFCCC).

Québec was appointed co-chair of the platform for cooperation on Carbon Pricing in the Americas. It also co-chaired the International Carbon Action Partnership (ICAP) from 2014 to 2018.



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