A WIN-WIN FOR QUÉBEC AND THE PLANET.

2030 Plan for a Green Economy

FRAMEWORK POLICY ON ELECTRIFICATION AND THE FIGHT AGAINST CLIMATE CHANGE

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2030 Plan for a Green Economy

FRAMEWORK POLICY ON ELECTRIFICATION AND THE FIGHT AGAINST CLIMATE CHANGE

Message from the Premier of Québec

More wealth...

Of all the American states and Canadian provinces, Québec emits the fewest greenhouse gases per capita.

That's something to be proud of! But rather than resting on our laurels, I want to encourage Quebecers to use that pride to push themselves further, to take up the challenge of climate change and overhaul our economy.

Electrifying our economy

The electrification of our economy is at the heart of this project.

Our great rivers are a source of clean, abundant, and affordable energy. These invaluable assets, combined with wind power and other forms of clean energy, will allow us to significantly reduce our greenhouse gas emissions while creating more wealth.

To meet the climate challenge, we need to replace fossil fuels as much as possible with our own clean electricity. That's the best way to reduce our greenhouse gas emissions while generating wealth for ourselves. We also need to electrify our transportation, our buildings, and our businesses. Finally, we need to increase public transit in our major cities and run electric buses, trucks, and cars throughout Québec's regions.

The resulting benefits will be significant for everyone. Our reserves of lithium and strategic minerals give us the means we need to take our place in the global battery and electric vehicle market. We have what it takes to be a world leader in the electrification of the economy.

Right now, we're burning imported oil to get from place to place. We're effectively burning money and producing greenhouse gases. But within a few years, we'll be able to use our own clean energy in locally-produced batteries. We'll be able to develop a channel to responsibly recycle end-of-life batteries. We'll be able to create wealth for ourselves every time we go out, all while reducing our carbon footprint and improving our quality of life. Every Quebecer will be saving thousands of dollars.

We also need to make better use of energy and exploit the full potential of bioenergies. Along with the electrification of the economy, energy efficiency and other sources of renewable energy (like green hydrogen) can also generate wealth and productivity for our province.

A daring people

The daring of our people is our greatest strength.

In the last century, our predecessors were told that it was impossible to build large dams in the north. Yet they were able to work with Indigenous peoples and succeed. We need to tap into the same ambition they had; the ambition that drives the great visionaries and builders. That same ambition is at the heart of the **2030 Plan for a Green Economy**.

A major endeavour

With our clean electricity, we can become the green battery of northeastern North America.

Our green economy will make us even more attractive to international investors. And by exporting more electricity to our neighbours, we'll be helping them move away from polluting energies like coal.

Our ambition also extends to strengthening the industries associated with electrifying transport. By producing, using, and exporting bioenergies and green hydrogen, we'll be contributing to the reduction of greenhouse gas emissions and strengthening Québec's economy at the same time.

With this plan, we are launching what will undoubtedly be the biggest economic endeavour in the past several decades. We will achieve our goal with the help of our two greatest strengths: the richness of our land and the daring of our people.

This plan is a win-win for Québec and the planet.

Québec Premier

François Legault

Message from the Minister of the Environment and the Fight Against Climate Change, Minister Responsible for the Fight Against Racism and Minister Responsible for the Laval Region

… fewer GHGs!

Quebecers care deeply about the fight against climate change, as evidenced by their unprecedented mobilization on the matter. However, the climate crisis means that we need to pick up the pace, a requirement enhanced by the need to sustainably restart our economy as a result of the COVID-19 pandemic.

Our vision for a successful climate transition is to build on Québec's strengths, particularly its clean electricity. To that end, Québec has adopted its first framework policy on electrification and the fight against climate change, the **2030 Plan for a Green Economy**.

Throughout the consultations held to develop this plan, I have seen just how many citizens, companies, and organizations of all kinds are already actively seeking solutions. Despite the challenges of the current situation, that drive makes me confident in our ability to mobilize to achieve the climate objectives we have set for ourselves.

We have to admit that the challenge ahead is huge! Québec has committed to reducing its greenhouse gas emissions to 37.5% below 1990 levels by 2030. It's an ambitious goal for a nation whose electricity generation already comes almost entirely from clean, renewable sources. It means that we will need to focus on more difficult reduction of greenhouse gases that will require a thorough rethinking of our production methods and lifestyles.

At the same time, we have two other challenges: we need to help our communities adapt to the existing reality of climate change and support our workers through a just transition to a lower-carbon economy. The **2030 Plan for a Green Economy** sets out the principles that will guide us and the paths we will follow to do just that, using a responsible and realistic approach.

The electrification of our economy will include concrete measures for sustainable mobility, energy efficiency and conversion, land use planning, the development of clean technologies and bioenergies, waste management, the protection of natural environments and biodiversity, agriculture, and adapting infrastructures.

The plan is not an end point in itself, but a starting point for a battle that we need to wage on all fronts, one that will ultimately lead us to our major goal: a carbon-neutral Québec in 2050. Therefore, the government will be reviewing its plan each year—based on the progress we have achieved. From there, it will adjust the plan, if needed, to account for new scientific expertise and technological innovations, changing economic situations, and public support.

As Minister, I would like to express my appreciation to all those whose proposals and comments have inspired this plan. By joining forces, we have succeeded in establishing a solid plan to transform our society in a sustainable way. But the government cannot succeed alone. The **2030 Plan for a Green Economy** represents a strong move by the government to address the many collective challenges presented by the climate crisis, but we need everyone's participation if we are to reach our climate goals. It is up to all of us—governments, businesses, and citizens—to channel the energy, courage, and creativity that characterize Québec to get there!

Minister of the Environment and the Fight Against Climate Change,
Minister Responsible for the Fight Against Racism
and Minister Responsible for the Laval Region

Benoit Charette

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OVERVIEW

The government is releasing the **2030 Plan for a Green Economy**, signalling the start of an ambitious project to electrify the economy and fight climate change. Thereby, it lays the foundations of a green and prosperous economy by 2030.

With the **2030 Plan for a Green Economy**, the government is charting a roadmap for the next 10 years.

It is also reiterating its target for 2030: to reduce Québec's greenhouse gas emissions by 37.5% below 1990 levels by 2030. Achieving this target will require substantial effort from everyone. However, it will also offer new opportunities to improve Quebecers' lives and enrich Québec as a whole.

The government wants to make the fight against climate change a major lever for economic development and international outreach. To that end, it will be relying on the electrification of the economy, the development of other renewable energy resources, and the emergence of new cutting-edge economic sectors creating quality jobs. Furthermore, the fight against climate change will make Québec more resilient to its repercussions.

The launch of the **2030 Plan for a Green Economy** is part of a worldwide green recovery movement, marked by increasing efforts to reduce carbon dependency and maximize the social and economic benefits of fighting climate change.

Priority: Electrify Québec's economy as much as possible

The government is launching a major electrification project that largely focuses on the transport sector, with streetcar and light-rail projects and initiatives targeting city and school buses, cars, and trucks.

The electrification of the economy will have a direct and positive impact on the trade balance and will be a strategic factor in the resilience of Quebec's economy.

Positioning ourselves for the future: becoming a leader in renewable energies

As it has done in the past, through endeavours like the construction of large hydropower plants, Québec intends to develop other renewable energies (green hydrogen and bioenergies, among others) in order to position itself immediately as a leader in this emerging field.

The government has chosen a pragmatic approach that is based on deploying these alternate renewable energies as a complement to electrification when the latter is not possible. This pragmatic approach will also involve reducing energy demand at the source by encouraging energy efficiency.

Maximizing the economic benefits for Québec

The government intends to maximize the economic benefits for Québec. As we head towards a green and prosperous economy, it will support the Québec industries related to the electrification of the economy and the fight against climate change. In doing so, it is committing to building the economy of tomorrow and making the fight against climate change a source of growth, jobs, and innovation.

Acting on all fronts

Part of the government's plan includes acting on other fronts of climate change mitigation. In particular, it will be working on land use planning, sustainable mobility, improving industries' carbon footprint while ensuring their competitiveness, and more efficient uses of energy in building heating.

At the same time, it will make sure that Québec is able to better adapt to the impacts of climate change.

Reducing greenhouse gas emissions and developing adaptation initiatives will result in better air quality, and major improvements to citizens' health and quality of life.

The government is also committed to leading by example and showing leadership to reduce its own emissions and engage citizens, municipalities, and businesses in the fight against climate change.

A long-term commitment

This ambitious project to electrify the economy and combat climate change is just beginning, and will continue for decades to come. While the **2030 Plan for a Green Economy** is primarily focused on the 2030 horizon, it also aims to put Québec on the right path for the future, for 2050 and even beyond. In light of the progress of international climate negotiations and emerging climate agreements, the government intends to make a longer-term commitment to achieve carbon neutrality by 2050.

A roadmap for the next ten years

Québec is already starting from an enviable position, with one of the lowest per-capita emission rates in North America.

From 1990 to 2017, Québec achieved to reduce its greenhouse gas emissions by nearly 9%. However, its annual greenhouse gas emissions have been stagnating since 2014. This does not put Québec on an ideal trajectory for 2030 and beyond.

Achieving the 2030 target means ultimately emitting just 54 million tons of CO_2 equivalent in that year. Yet it is estimated that, without continuing current efforts and implementing new measures, Québec's greenhouse gas emissions could reach 83 million tons of CO_2 equivalent by 2030. In other words, we need to ultimately reduce emissions by 29 million tons of CO_2 equivalent.

Nine principles to guide government action

The **2030 Plan for a Green Economy** is part of an orientation towards sustainable development.

As the framework policy for climate change, the **2030 Plan for a Green Economy** is based on nine principles that guide government action:

- Electrification and the fight against climate change are major levers for economic development and the creation of wealth.
- Electrification and the fight against climate change must maximize the reduction of greenhouse gas emissions across Québec while taking advantage of the flexibility offered by the carbon market.
- Electrification and the fight against climate change are grounded on the efficient use of energy and resources.
- Everyone is responsible for electrification and the fight against climate change.
- Electrification and the fight against climate change must be implemented with a positive approach that highlights the gains to be made and generates the motivation we need to get there.
- Electrification and the fight against climate change objectives will need to be integrated into government orientations, policies and strategies.
- For both electrification and the fight against climate change, the government intends to act pragmatically, rigorously, and effectively, using a science-based approach and prioritizing the results to be achieved while accounting for the future climate and the realities of the various areas that fall under the scope of this project.
- The government's vision of electrification and the fight against climate change is not limited to Québec. The Plan must ensure that Québec contributes beyond its borders.
- Electrification and the fight against climate change must ensure a just transition for society as a whole and factor in the specific realities of each of Québec's regions.

An evolving implementation

Over a ten-year horizon, the **2030 Plan for a Green Economy** will be deployed through a five-year implementation plan, that will be updated annually to cover the next five years.

Collective efforts

The fight against climate change is significant and calls for the contributions of everyone. The Québec government's actions will rely on the commitment of its citizens, municipalities, researchers, and companies, whose initiatives will be solicited and supported. In particular, all municipalities will be encouraged to develop their own climate change plans.

The federal government will also need to make a significant contribution to the collective effort.

Our clean electricity: an invaluable asset

The **2030 Plan for a Green Economy** aims to capitalize on one of Québec's most invaluable assets: its clean electricity. Québec has some of the most carbon-efficient energy production in the world, with more than 99% of its energy coming from renewable sources.

In the coming years, the government, supported by Hydro-Québec, will rely on rigorous planning to ensure clean, renewable electricity generation that aligns with the increased electrification of Québec's economy. Special attention will be paid to measures that reduce peak demand.

Mitigating climate change

Electrifying public transportation

The government is taking vigorous action to electrify the public transportation sector.

It is firmly committed to completing several structuring transportation projects, all of which involve electric streetcars or light-rail trains, in Québec's urban regions.

The government is furthering the shift already underway in public transportation funding, which aims to ensure the electrification of buses. The objective is that by 2030, electric buses should account for 55% of all city buses.

Specific initiatives will also focus on accelerating the acquisition of electric school buses, with the goal of having 65% of school buses be electric by 2030.

Electrifying light vehicles and building a charging infrastructure

As for light vehicles, the government aims to have 1.5 million electric vehicles on Québec's roads by 2030. The government will maintain purchase incentives to reduce price gaps when purchasing or leasing electric vehicles. These incentives will be adjusted as the market evolves. This desire to accelerate electrification is part of a long-term perspective, one that extends beyond 2030. The government's intention is that electric and other zero-emission vehicles will account for 100% of motor vehicle sales by 2035, and that the sale of gas-powered vehicles will be prohibited.

In order to ensure that a sufficient number and variety of electric vehicles are available, the government also intends to strengthen its standard for zero-emission vehicles, the ZEV standard, which encourages manufacturers to offer those vehicles.

The government will intensify efforts to set up charging stations, in rural and urban areas alike.

Other initiatives will target taxis, with the aim of having 40% of taxis be electric by 2030. Efforts to electrify light vehicles will also extend to companies with fleets that can be electrified.

Electrifying trucks

Recent technological innovations have made it possible to buy 100% electric Québec-made trucks.

While the technology remains available but expensive, the government's support will include assistance to reduce the cost of purchasing the vehicles. At the same time, the government will be supporting Québec's electric truck manufacturing industry.

In areas where the technology is new or non-existent, the government will support innovation and demonstration in order to actively participate in the development of Québec-made electrification solutions that are suited to heavy transport. Furthermore, the government's support will extend to the implementation of these new technologies in the industry.

Rethinking travel sustainably

The government will revise its approach to sustainable land use planning so that it can better contribute to meeting the targets for reducing greenhouse gas emissions. For instance, densification, optimal management of urbanization, and integrated planning will help reduce greenhouse gas emissions from the transport sector.

With sustainable mobility, the government wants to reduce the need for travel at the source and encourage the replacement of solo vehicles with other means of mobility: public transportation, active transportation, and shared transportation. The government's efforts will be focused on improving the quality, quantity, and variety of these solutions.

The shift towards sustainable mobility also involves changing the way goods are transported. To that end, the government intends to rely on intermodality and multimodal networks to minimize the number of goods that are carried by truck.

Electrifying vehicles: government as a role model

To set an example, the Québec government will accelerate the electrification of its light vehicle fleet by 2030. It intends to electrify 100% of the cars, vans, minivans, and sport utility vehicles (SUVs) used by its ministries, some agencies, the health and social services network, and the education and higher education network. The government also aims to electrify 25% of those entities' pickup trucks by 2030. At the same time, it intends to speed up the installation of charging stations in its own buildings. Finally, it will work towards electrifying its heavy vehicle fleet.

More competitive industries that emit less carbon

Large industrial emitters of greenhouse gases are subject to the carbon market, which grants them a certain number of free emission allowances. The government will announce new rules on free allowances for the 2024–2030 period. This will require a significant effort from companies, in line with the greenhouse gas reduction objectives, while providing them with a predictable and stable environment to make the necessary investments.

The government will provide a mechanism to auction off some of the emission allowances allocated freely to emitters. Businesses that are eligible for free allowances will collect funds in return for the reduced allocation, starting in 2024. They will need to use those funds to invest in emissions reduction projects or research and development projects aimed at reducing emissions. This will serve as an unprecedented lever for investment in reducing greenhouse gas emissions in Québec.

Appropriate financing tools will be created to accelerate those investments, rather than waiting for money to accumulate from 2024 onwards. The government will focus on customized support based on improved knowledge of companies' ability to reduce their greenhouse gas emissions.

Increasing electrification and the use of alternative energies in the industrial sector

The industrial sector requires a multi-pronged approach to energy solutions.

The government will prioritize actions in areas where technologies are already in place and have the best potential for electrification. At the same time, it will accelerate research and development activities in areas where the technologies are still emerging. It will also promote existing technologies that use electricity and support their implementation in companies.

Bioenergies, and potentially green hydrogen, could also replace fossil fuels in areas where electricity is not a feasible or economically viable option. Finally, where fossil fuels are necessary, they will need to be used more efficiently, with a focus on the least polluting forms.

Buildings: a new approach to reducing fossil fuel consumption

The government is breaking new ground by bringing together Québec's two main energy distributors, Hydro-Québec and Énergir, with the common goal of reducing greenhouse gas emissions from building heating by 50% by 2030.

A partial conversion from natural gas to electricity will be part of a balanced approach based on the complementarity of the electrical and gas grids, maximizing the economic benefits while minimizing the costs for customers. The government will also prioritize the use of renewable energies and focus on greening natural gas. After all, it will take strong action to make buildings more energy efficient and reduce their carbon footprint.

In addition, by 2030, the use of fuel oil for heating buildings will be phased out and replaced, primarily by electricity and by other renewable energies.

Beyond the greenhouse gas emissions associated with heating buildings, the government will promote the use of materials with a lower carbon footprint like wood and other organic materials.

The government has committed to reducing the greenhouse gas emissions from its buildings to 60% below 1990 levels by 2030.

Agricultural production, waste management, and natural environments

The efforts to mitigate climate change described in the **2030 Plan for a Green Economy** also follow an approach that has been tailored to fit the agricultural sector (based on supporting agricultural businesses and expanding local consumption); to reduce and better manage waste; and to rely more on natural resources like forests to sequester carbon.

Improving access to electricity

A small number of Hydro-Québec customers are not connected to the main grid because they live in remote areas. These clients are served by 22 off-the-grid systems, which must produce their own power. Most of those systems use diesel generators, which emit greenhouse gases. Numerous projects are planned or underway to replace some or all of the output from thermal power plants in off-grid systems.

In regions that are connected to the main grid, steps will be taken to extend the three-phase grid to certain rural areas, consolidate the electrical grid in oversaturated sectors, and complete the grid to reach certain unconnected industrial and agricultural consumers.

Building the economy of tomorrow

Taking advantage of our clean electricity

The government wants to make Québec the “battery” of northeastern America. Given the current climate crisis, Québec is well positioned to consolidate its status as North America’s leading supplier of clean energy.

Major export projects are already under development and more may emerge in the coming decade. By 2030, the government has set its sights on increasing electricity exports to neighbouring markets under long-term contracts. It will propose energy alliances to neighbouring provinces and states in the American Northeast in order to promote Québec’s resources and increase electricity exports. These energy alliances will make the American Northeast a greener, more competitive region.

For several decades, electricity has been a powerful factor in the industrialization of Québec’s economy, attracting investments that have profoundly transformed and enriched numerous regions. With the **2030 Plan for a Green Economy**, the government intends to build on this strategic asset to boost the productivity of Québec’s economy and stimulate investment and innovation while reducing greenhouse gas emissions from its activities.

Becoming a leader in the production of green hydrogen and bioenergies

Québec intends to position itself as a leader in the production of green hydrogen and bioenergies, which are clean energy sources that can be used as a complement to electricity.

Developing the production of green hydrogen will make it possible to reduce our use of imported fossil fuels, and therefore greenhouse gas emissions. That development will make Québec's energy systems more resilient while creating jobs in all regions.

Developing the green hydrogen industry will require significant investments from the private sector. The government will reassure investors by creating a stable and predictable economic environment, based in particular on Québec's expertise.

Like green hydrogen, bioenergies will complement electricity as a way of reducing Québec's carbon footprint. Developing and expanding these energies will help us achieve environmental targets. Bioenergies will also help diversify and secure energy supplies, improve Québec's economic balance, and generate significant social and economic benefits in regions as part of a circular economy.

The government is maintaining its target of increasing bioenergy production by 50% by 2030. In addition, it plans to increase the minimum volume of renewable natural gas injected into the natural gas grid to 10% by 2030.

The great electrification endeavour

The government's major transport electrification endeavour, launched with the **2030 Plan for a Green Economy**, is an exceptional opportunity for growth and development for all the industries that will be associated with it.

For the construction of public transit networks, the government will use the tools at its disposal to make sure that Québec industry will profit from the economic benefits of investments as much as possible, in compliance with Québec's Canadian and international trade commitments. In particular, these investments will support the development of Québec's railway industry.

Many electric vehicles are manufactured in Québec, including specialized vehicles and heavy trucks for transporting goods. Some Québec companies are also active in the conversion of both light and heavy vehicles. These activities rely on a multitude of Québec's distributors that can supply manufacturers with parts and components. Québec is also an innovator in the manufacture of electric buses (both public and school), and the prospects for development in that industry are promising.

Batteries are the most valuable component of electric vehicles, which is why there is much interest in more thoroughly developing this industrial sector in Québec. The government intends to play an active role in that development. For instance, the processing of critical minerals will be an important part of the strategy that the government will implement. The aim is to develop a complete, efficient supply chain, from mining to battery manufacturing. Major investments and the attraction of global players in the sector will be needed if Québec's battery industry is to reach its full potential by 2030. The government may also support projects to manufacture in Québec and export key battery components like anodes and cathodes.

Québec will also ensure that end-of-life batteries are recycled and their parts are recovered. That market is still emerging, and Québec is well positioned to become a major player.

Finally, charging stations are another opportunity for development, and their production is already well established in Québec.

Other strategic sectors

The **2030 Plan for a Green Economy** paves the way for the development of many other strategic sectors.

Carbon sequestration and utilization technologies are, for the most, still in the development stage. Some projects are emerging in Québec and could represent interesting potential in the coming years.

Another promising sector is that of the green and smart buildings, which aims to integrate cutting-edge practices into buildings right from the beginning using information technologies. Similarly, the high demand for innovative, eco-friendly building materials will support the forestry and wood construction sectors.

The government will also support the development of specialized services for managing greenhouse gas emissions. In addition, investments in preventing the risks associated with climate change will open up development opportunities for many businesses and multiple trades, especially in the construction sector.

Innovation driving the economy of tomorrow

The development of solutions to electrify the economy and fight climate change will provide plenty of opportunities for innovation. To that end, the government will target strategic niches of innovation for specific support. With the **2030 Plan for a Green Economy**, it will support the entire innovation chain dedicated to electrification and the fight against climate change, from research and development to commercialization and deployment.

Adapting to climate change

With the **2030 Plan for a Green Economy**, the government is doing more than just trying to mitigate the effects of climate change. It's also mobilizing the means necessary to adapt to these changes, both current and future, that Québec cannot avoid.

Already noticeable impacts

Québec is already being affected by the impacts of climate change. Those impacts vary by regions, and their consequences are experienced differently from one community to another. Flooding and coastal erosion are both examples of this. Northern Québec is being more rapidly and severely affected than the southern part of the province.

Climate change is posing increasing risks to the health and safety of individuals and communities, as well as to the integrity and sustainability of infrastructure. It also has direct and major consequences for many economic activities, terrestrial and aquatic ecosystems, and biodiversity.

Learn, prepare, and act

The government will encourage collaborative, inclusive, and multidisciplinary knowledge development. Risk analyses and the mapping of key climate change risks are also essential to the adaptation process.

The government will support skills development, workforce training, and the dissemination of tools to support adaptation efforts. In order to prepare for a structuring action, focus will be put on the development of multi-risk adaptation roadmaps at a regional scale or for vulnerable economic sectors or targeting major risks.

The government will strengthen its support for the implementation of sustainable adaptation solutions that focus on prevention and take the future climate into account.

Acting preventively

It is in Québec's best interest to prevent the impacts of climate change.

To that end, it will protect the health and safety of its people and communities by focusing its efforts on preventing risks on the healthcare system and on the supply of drinking water, while keeping a continuous cooperation with the municipal administrations.

Québec's infrastructure needs to be adapted and resilient to face the impacts of climate change. The government will establish standards and regulations to ensure that infrastructures are designed, located, and managed taking into account climate change. Green infrastructures will be needed to reduce risks.

The government will support businesses and economic sectors by making tools and information available so that they can incorporate adaptation issues into their business strategies. It will monitor how climate change is affecting species and ecosystems to better support their conservation.

Land use planning: a powerful tool for adaptation

Development choices will make it possible to create safe, healthy, and sustainable living environments that are less vulnerable to the impacts of climate change. Municipalities and regional county municipalities have significant responsibilities when it comes to land use planning, and it will be necessary to rely on their expertise and leadership.

Considering land use planning so that population can adapt to climate change impacts will involve reviewing laws, regulations, design approaches, and many other factors that guide planning.

Deployment of the 2030 Plan for a Green Economy

The deployment of the **2030 Plan for a Green Economy** will be built on solid foundations.

Strong governance

The **2030 Plan for a Green Economy** will guide the government's actions and ensure their coherence through joint, coordinated efforts by its ministries and agencies.

The *Act mainly to ensure effective governance of the fight against climate change and to promote electrification*, which has been in force since November 1, 2020, formalizes the principles and modalities of this new governance. This act gives the Minister of the Environment and the Fight against Climate Change a lateral mandate and extends his powers to ensure a coordinated governmental approach in response to climate change.

The Auditor General of Québec, supported by the Sustainable Development Commissioner, has been given a new mandate that is directly linked to the Electrification and Climate Change Fund. The Climate Change Advisory Committee will issue public reports on all matters related to the continuous improvement of climate action.

Accountability for the **2030 Plan for a Green Economy** will be ensured through a system of transition indicators that is simple, effective and meaningful to the public. Annual reports will be published to present the progress of the climate transition.

Increased, innovative funding

The **2030 Plan for a Green Economy** will be supported by important financial means. Its implementation will rely on many sources of funding, both public and private.

In particular, funding will rely mostly on resources from the carbon market, managed through the Electrification and Climate Change Fund.

The government will add further investments. Government entities will also be called upon to broaden their scope in order to better contribute to the fight against climate change. The **2030 Plan for a Green Economy** calls for the implementation of blended finance arrangements, calling for non-governmental resources.

The government will assess the applicability of ecofiscal measures, using a positive approach that does not increase the tax burden on taxpayers.

Working closely with Indigenous peoples

Depending on their geographical location and lifestyle, First Nations and Inuit communities may be vulnerable to a wide range of climate change impacts threatening the sustainability of their traditional practices on which their health, lifestyles, and quality of life depend.

Working closely with Indigenous peoples is essential to ensure that the measures designed and implemented under the **2030 Plan for a Green Economy** are both appropriate and effective.

Accelerating knowledge development

The government will strengthen access to knowledge to guide its actions properly. In particular, it will support cutting-edge knowledge so that it can rely on strategic centres of expertise.

INTRODUCTION

TOWARDS A GREEN AND PROSPEROUS ECONOMY

With the **2030 Plan for a Green Economy**, the government is embarking on an ambitious electrification and climate change project that will lay the foundation for a green and prosperous economy by 2030.

A clear vision

The government **is confirming its commitment to reducing greenhouse gas emissions to 37.5% below 1990 levels by 2030**.

Achieving this target will require substantial effort from everyone, but it will also create opportunities to improve our quality of life and to enrich ourselves.

The government's vision is clear: make the fight against climate change a major lever for economic development and international outreach. That vision is rooted in the electrification of Québec's economy, particularly when it comes to transport, the development of our other renewable energy resources, and the emergence of new cutting-edge economic sectors that create quality jobs. It will also contribute to our collective resilience.

A worldwide transition

The global climate transition is a source of investment and opportunities to create wealth.

At the time of launching this plan, the global economy is facing unprecedented difficulties due to the COVID-19 pandemic.

The launch of the **2030 Plan for a Green Economy** has therefore become part of a worldwide green recovery movement, marked by increasing efforts to reduce carbon dependency and maximize the social and economic benefits of the climate transition.

This particular global context also highlights the ways that local consumption benefits the environment and the economy alike while fostering our growing resilience capacity.

Priority: Electrify our economy as much as possible

For the government, it is a priority to electrify our economy as much as possible. Transport is a major focus of this effort; the goal is to replace the use of imported fossil fuels with that of green energy produced in Québec.

The abundance of available, competitive hydroelectric resources in Québec is an invaluable asset that needs to be fully developed.

Electrification and the fight against climate change offer Québec the opportunity to take full advantage of its clean electricity, develop world-class industrial sectors in promising cutting-edge industries, and support well-paying jobs.

Electrification could also bring additional revenues to Hydro-Québec, and therefore increased dividends to the government, benefiting all Quebecers.

Major endeavour: electrifying transport

A major electrification endeavour has been launched for the transport sector—one that will include a series of structuring projects for electric transport.

Through this major endeavour, Quebecers will eventually be able to travel in environmentally friendly electric vehicles that are locally made as often as possible.

The transport sector is the leading source of greenhouse gas emissions, so electrifying it is critical. Electrification also serves as an opportunity for Québec to develop a dynamic and innovative industrial ecosystem around electric vehicles, batteries, and recharging infrastructures to emerge as a leader in the field. Québec is already counting on strategic industrial players in the field of transport as well as a diverse, internationally recognized supply chain. It has the potential to provide the most critical links in that chain, particularly in the battery field—from the extraction of essential minerals to the production of battery parts.

Becoming the battery of northeastern America and reaching out to the world

Electrification and the fight against climate change will help build Québec's influence beyond its borders, thanks to the export of not only clean energy, but also Québec's expertise, products, and services within the green economy.

Through partnerships that benefit everyone, Québec will help its neighbours reduce their greenhouse gas emissions while enriching its own citizens.

Positioning ourselves for the future: becoming a leader in renewable energies

As it has done in the past, through endeavours like the construction of large hydropower plants, Québec intends to develop other renewable energies in order to position itself immediately as a leader in this emerging field.

Developing these renewable energies, which include green hydrogen and bioenergies, offers new prospects for our economy.

In particular, with the **2030 Plan for a Green Economy**, Québec's ambition is to be recognized around the world for its green hydrogen, as it already is for its clean electricity. What's more, it has all the assets it needs to do so.

The development of these new energies could also serve as a calling card for foreign companies interested in setting up here.

A pragmatic energy approach

The government has chosen a pragmatic approach that is based on using these alternate renewable energies as a complement to electrification when the latter is not technically or economically possible. The approach also involves reducing energy demand at the source by encouraging energy efficiency.

Greater use of other locally produced renewable energy sources will create further opportunities to fight climate change using local resources.

Fossil fuels, including natural gas and oil, will still be part of Québec's energy landscape in 2030. However, lowering demand—through conversion to renewable energy using tools like electrification, efficient project design, and energy efficiency—will help reduce our reliance on them.

In fact, the government aims to **reduce the consumption of petroleum products by 40% by 2030**[1].

1. Québec 2030 Energy Policy.
   This target is a reduction from the 2013 level.

Maximizing the economic benefits for Québec

The willingness to support Québec's industrial sectors that contribute to the electrification of the economy and the fight against climate change will remain unwavering as we journey towards a green and prosperous economy. The ambitious ten-year project offers a unique opportunity to make Québec an economic leader in many sectors.

Electrifying the economy will be a strategic factor in its resilience and have a direct and positive impact on the trade balance.

With the **2030 Plan for a Green Economy**, the government aims to achieve its target for reducing greenhouse gas emissions by maximizing reductions across Québec. This, in turn, will allow it to purchase as few emission rights as possible outside its borders, something allowed by the carbon market that has been in place since 2013[2]. In doing so, we must ensure that as many investments as possible are made in Québec.

The government is committed to building the economy of tomorrow by taking full advantage of climate change investments and making them a source of growth and jobs. Support for innovation will help maximize the local benefits for this ambitious project.

Energy efficiency and responsible consumption will also leave more money in Quebecers' wallets.

Finally, by having a low-carbon economy that is resilient to the impacts of climate change, Québec will become even more attractive to international investors.

Acting on all fronts

A more carbon-efficient Québec

Beyond electrification efforts and the development of alternative renewable energies, the government will act on other fronts to mitigate climate change.

In particular, it will be working on land use planning and sustainable mobility, improving industries' carbon footprint while ensuring their competitiveness, and exploring more efficient uses of energy in building heating. Further actions will target the agricultural sector, waste management, the protection of natural environments, and the generation of electricity in off-grid systems.

Increasing resilience

At the same time, the government will be making sure that Québec is equipped to better adapt to the impacts of climate change.

The consequences of climate change are already being felt; they directly affect economic activities, well-being, health and safety of many citizens and communities, as well as infrastructures, and ecosystems. With the **2030 Plan for a Green Economy**, the government is building on a structured adaptation approach that emphasizes prevention and consideration of the future climate in order to better protect the population.

2. See point 1 in the Appendix.

Improving quality of life

Reducing greenhouse gas emissions and developing adaptation initiatives will result in better air quality and major improvements to citizens' health and quality of life.

Government as a role model

By leveraging its advantages and resources, Québec will contribute[3] to the worldwide fight against climate change.

There is a sense of pride in being part of the global effort and participating in this collective project.

The government is committed to leading by example as a way of encouraging citizens, municipalities, and businesses to take action in the climate transition process.

To that end, the government will set an example by going beyond the ambitions of the target set for all of Québec by 2030. It will take decisive action to reduce its own greenhouse gas emissions.

The government will also set an example in the acquisition of Québec's products and services when it comes to electrification and the fight against climate change. It will become a showcase for supporting local products and services while leveraging the development of the businesses that offer them.

The government's commitment to serving as a role model will also be reflected in its climate change adaptation efforts, which will involve taking tomorrow's climate into account when locating, designing, and managing public infrastructures.

A long-term commitment

The budding climate transition will continue over the coming decades. While the 2030 Plan for a Green Economy is primarily focused on the 2030 horizon, it also aims to put Québec on the right path for the future—for 2040, 2050, and even beyond.

With the 2030 Plan for a Green Economy, the government is sending a clear signal about Québec's long-term commitment to climate transition. That provides the predictability needed for long-term planning and major investments that will need to be made, particularly in terms of land use planning, transport systems, industry, and the management of our forests.

In light of the progress of international climate negotiations and emerging climate agreements, the government intends to make a longer-term commitment to achieve carbon neutrality by 2050. Being carbon neutral throughout Québec means ensuring that, overall, our activities do not contribute to global warming. That, in turn, means creating a greenhouse gas balance sheet and making sure it stays balanced—in other words, ensuring that Québec only emits the same quantity of greenhouse gases as it contributes to remove from the atmosphere.

The first step in achieving carbon neutrality is to avoid and reduce greenhouse gas emissions as much as possible. If this is insufficient, sequestration or compensation can be used to achieve a greenhouse gas balance.

3. See point 2 in the Appendix.

Strong and renewed governance

The **2030 Plan for a Green Economy** will be backed by strong and renewed governance.

This governance includes an expanded role for the Minister of the Environnement et de la Lutte contre les changements climatiques and the Fight Against Climate Change, a clear division of roles and responsibilities within government, strengthened ministerial responsibility, and rigorous and transparent accountability. It also ensures greater coherence and efficiency in government action.

An ambitious and mobilizing project

The **2030 Plan for a Green Economy** was developed after consultation with civil society and numerous experts throughout Québec[4].

With the **2030 Plan for a Green Economy**, the government is committing all Quebecers to this ambitious and mobilizing project: one that is sure to be a win-win for Québec and the planet.

4. See point 3 in the Appendix.

A ROADMAP FOR THE NEXT TEN YEARS

Québec is already doing well in terms of greenhouse gas emissions. However, significant effort is still needed to achieve the ambitious target it has set for 2030.

The **2030 Plan for a Green Economy** is the framework policy that will guide the government's actions on electrification and climate change for the next ten years. It is Québec's roadmap for achieving its greenhouse gas emissions reduction target and implementing the government's vision for 2030.

The **2030 Plan for a Green Economy** is divided into three pillars:

- Mitigating climate change
- Building the economy of tomorrow
- Adapting to climate change

This plan relies on Québec's solid foundation to build and enhance the benefits of a climate transition for all Quebecers. In particular, it will take advantage of an invaluable asset: Québec's clean energy.

1.

THE STARTING POINT

Québec is already starting from an enviable position, with one of the lowest per-capita emission rates in North America.

Highlights[5]

- Lowest per-capita greenhouse gas emissions in any Canadian province or American state: 9.5 tons/inhabitant
  - 99% of electricity comes from renewable sources
  - No hydrocarbon production sector
  - Clean energy provider to its neighbours
- Main greenhouse-gas-emitting sector: transport, with 43% of emissions
  - Heavy dependence on oil
- Emissions decreased 9% from 1990 to 2017
  - Reduction has been stagnating since 2014
  - Uneven performance across sectors
- Oil: source of more than 50% of total greenhouse gas emissions
  - Accounts for 57% of the trade deficit in 2017

5. This portrait of Québec's greenhouse gas emissions is the most recent available at the time of publication of the **2030 Plan for a Green Economy**. Data is for the year 2017 as published in December 2019 by the Ministère de l'Environnement et de la Lutte contre les changements climatiques in the *Inventaire québécois des émissions de gaz à effet de serre en 2017 et leur évolution depuis 1990.*

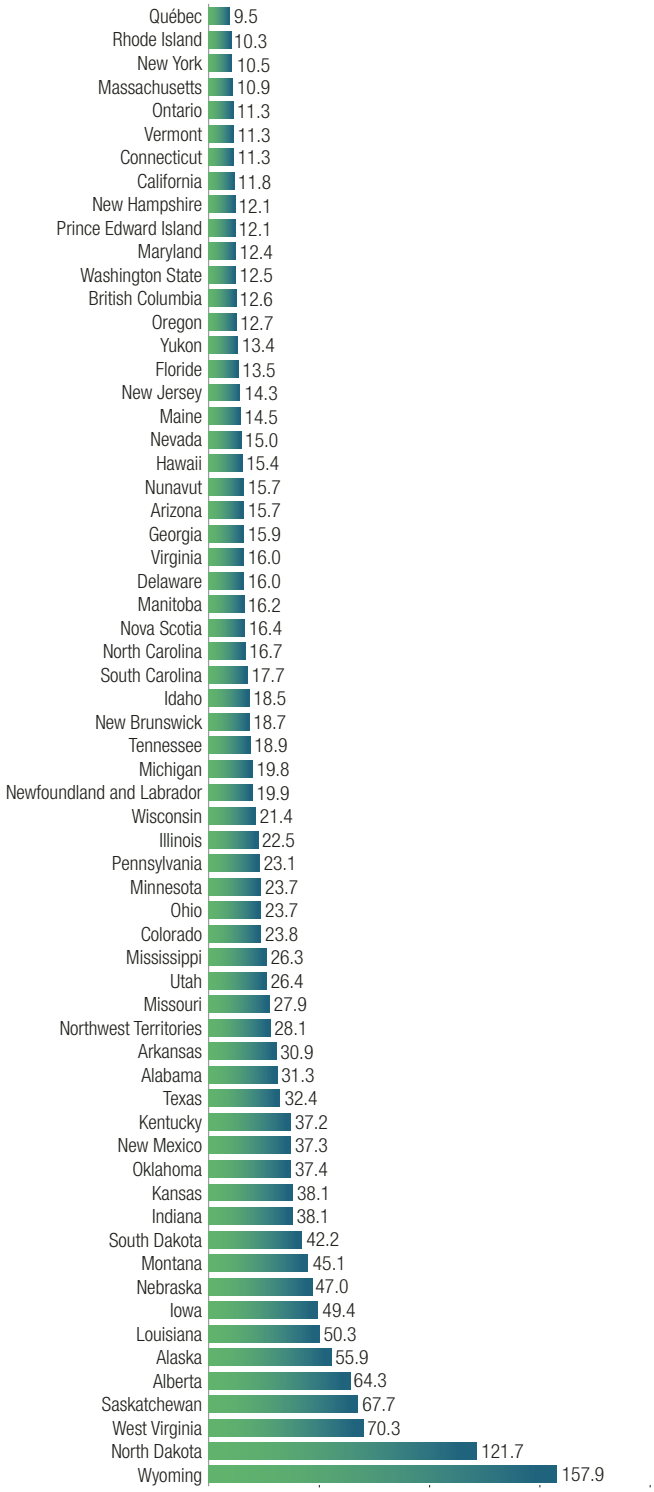
Greenhouse gas emissions per capita

Of the 50 American states and 13 Canadian provinces and territories, Québec has the lowest per-capita greenhouse gas emissions at approximately 9.5 tons per capita. Note that in 2017, Québec's greenhouse gas emissions represented less than 0.2% of the world total.

This good performance in terms of per-capita greenhouse gas emissions in North America is thanks in particular to Québec's electricity generation, over 99% of which is from renewable sources.

In other words, Québec is already starting from a very desirable position. We are among the leaders in North America, and we must ensure that this remains the case, particularly when it comes to the regions to which we generally compare ourselves: New York, the New England states, California, and Ontario.

FIGURE 1
Greenhouse gas emissions per capita in Québec, Canadian provinces and territories, and American states (in tons of CO_2 equivalent)



Note: The latest available data for Canadian provinces and territories are from 2017. For the American states, they are from 2014.

Source: Ministère de l'Environnement et de la Lutte contre les changements climatiques (2019). *Inventaire québécois des émissions de gaz à effet de serre en 2017 et leur évolution depuis 1990*, Québec, 44 p., and World Resource Institute.

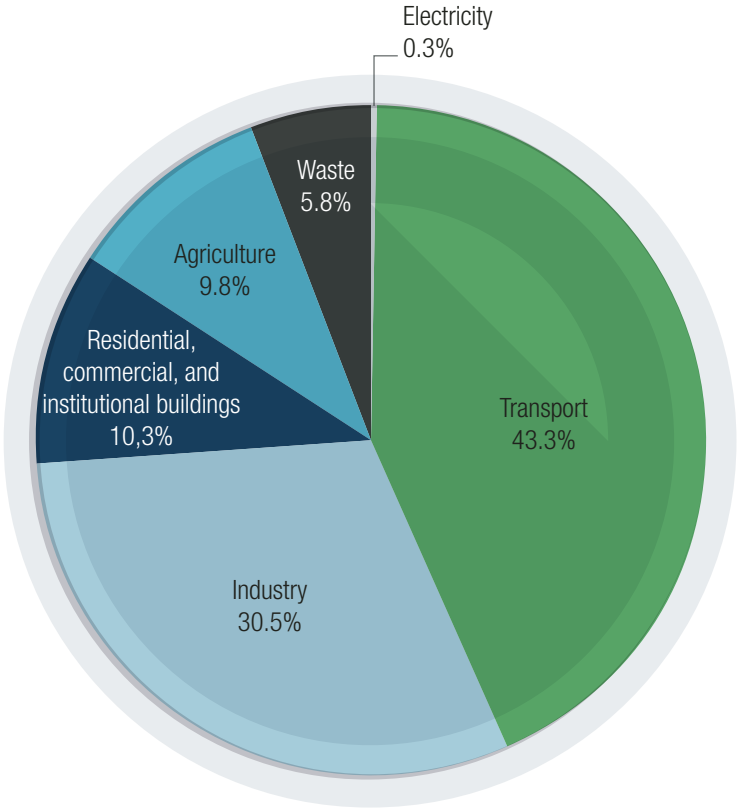
Greenhouse gas emissions by energy type and sector

In 2017, 68% of Québec's greenhouse gas emissions came from the consumption of fossil fuels, mainly oil and natural gas. In fact, oil was the source of more than 50% of total greenhouse gas emissions in Québec[6].

In addition to their consequences for the environment, fossil fuels account for most of Québec's trade deficit. In 2017, the total value of international and interprovincial crude oil imports was estimated at $8.5 billion, or about 57% of the total trade deficit.

The transport (43.3%) and industry (30.5%) sectors were the most responsible for greenhouse gas emissions in 2017, accounting for nearly three quarters of Québec's total.

FIGURE 2
Breakdown of greenhouse gas emissions in Québec by sector – 2017



Source: Ministère de l'Environnement et de la Lutte contre les changements climatiques (2019). *Inventaire québécois des émissions de gaz à effet de serre en 2017 et leur évolution depuis 1990*, Québec, 44 p.

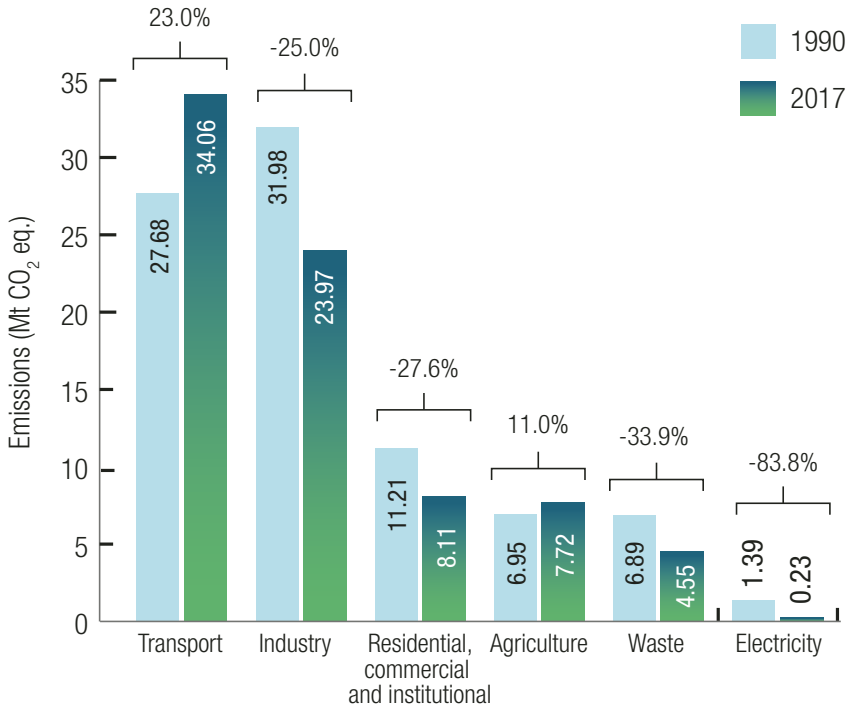
6. Whitmore, J., and P.-O. Pineau, *État de l'énergie au Québec 2020*, HEC Montréal Chair in Energy Sector Management, prepared for Transition énergétique Québec, 2020, Montréal, p. 46.

The evolution of emissions since 1990

From 1990 to 2017, Québec achieved to reduce its greenhouse gas emissions by nearly 9%, reaching 79 million tons of CO_2 equivalent. In comparison, its greenhouse gas emissions were 86 million tons of CO^2 equivalent in 1990. During the same period, the population grew by 19% and the GDP increased by 66%.

However, this performance is uneven across sectors. While emissions increased in the transport sector (+23%), increasing our dependence on imported oil, they dropped significantly in the industry sector (-25%) due to fossil fuel substitution, improved energy efficiency, and economic restructuring.

FIGURE 3
Evolution of greenhouse gas emissions by sector in Québec in 1990 and 2017



2.

TAKING ACTION

Despite the reduction in greenhouse gas emissions between 1990 and 2017, annual emissions have been stagnating since 2014.

Québec is not currently on track to meet the 2020 target of a 20% reduction in emissions from 1990 levels by relying on local reductions alone[7].

This, in turn, does not put Québec on an ideal trajectory for 2030 and beyond. A new impulse is needed.

With the **2030 Plan for a Green Economy**, the government is confirming its commitment to achieving the target of a 37.5% reduction in greenhouse gas emissions below 1990 levels by 2030, as well as its desire to maximize those reductions across Québec.

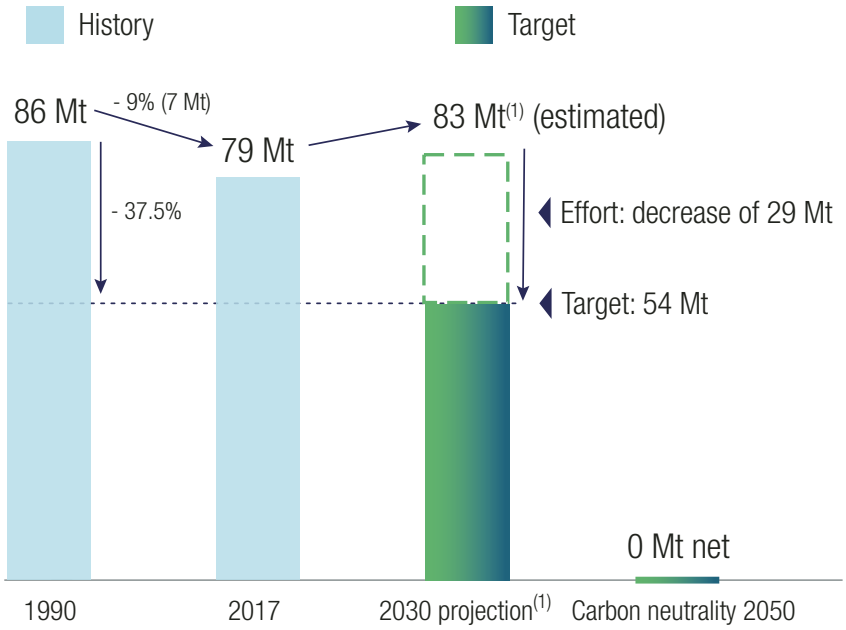
Achieving this target means ultimately emitting just 54 million tons of CO_2 equivalent in 2030. Yet, according to the most recent forecasts when launching the **2030 Plan for a Green Economy**, greenhouse gas emissions in Québec could reach 83 million tons of CO_2 equivalent in 2030 if current efforts are not continued or new measures are not implemented.

That corresponds to an estimated reduction effort of 29 million tons of CO_2 equivalent in 2030, or almost four times the reductions achieved between 1990 and 2017.

This effort will be all the more demanding because as we make progress, additional reductions will become increasingly difficult to achieve; after all, the easiest actions are the first to be taken. That said, technological advances and economies of scale from the widespread use of reduction technologies will also allow promising new solutions to emerge over time.

7. The final data to determine whether the 2020 target was met will not be known until 2022.

FIGURE 4
Estimated efforts needed to reach the 2030 target
(in millions of tons of CO_2 equivalent, unless otherwise indicated)



Note: Estimates were based on the information available in February 2020.

(1) This projection scenario is based on actual economic data from 2017 to 2019 and the 2020–2021 budget forecast for the following years. It excludes the effects of the carbon market and the measures in the 2021–2026 Implementation Plan for the **2030 Plan for a Green Economy**. This projection scenario considers a number of factors, such as technological developments, improvements in energy efficiency, and anticipated price developments in the economy.

Sources: Ministère de l'Environnement et de la Lutte contre les changements climatiques and Ministère des Finances.

Note: For more details on emissions projections for 2030 in the absence of additional actions, see the Ministère des Finances'booklet entitled *Building a Green Economy – 2020–2021 Budget*, p. 11.

An evolving effort

It is difficult to precisely predict how various influencing factors will change by 2030.

Greenhouse gas emissions forecasts and the efforts needed to achieve the target are based on factors that will change over time, including:

- The impact of the measures implemented by the Government of Québec and any adjustments to them;
- The motivation of all citizens, as well as the initiatives and contributions of businesses, municipalities, and the federal government;
- Innovations and technological developments;
- The evolution of carbon pricing in Québec, the rest of Canada, and elsewhere;
- Economic growth and energy price trends.

The effort needed to reach the 2030 target is therefore based on a forecast of tomorrow's economic and social situation, which itself is based on today's knowledge.

Projections for greenhouse gas emissions are useful for guiding decision-making and indicating how much effort may be needed. Therefore, they will be reassessed annually so that they can account for new information.

3.

A FRAMEWORK POLICY FOR THE NEXT TEN YEARS

The **2030 Plan for a Green Economy** sets out clear principles to guide the directions and actions of the entire government when it comes to electrification and climate change. Implementing this plan will be a dynamic, adaptive process.

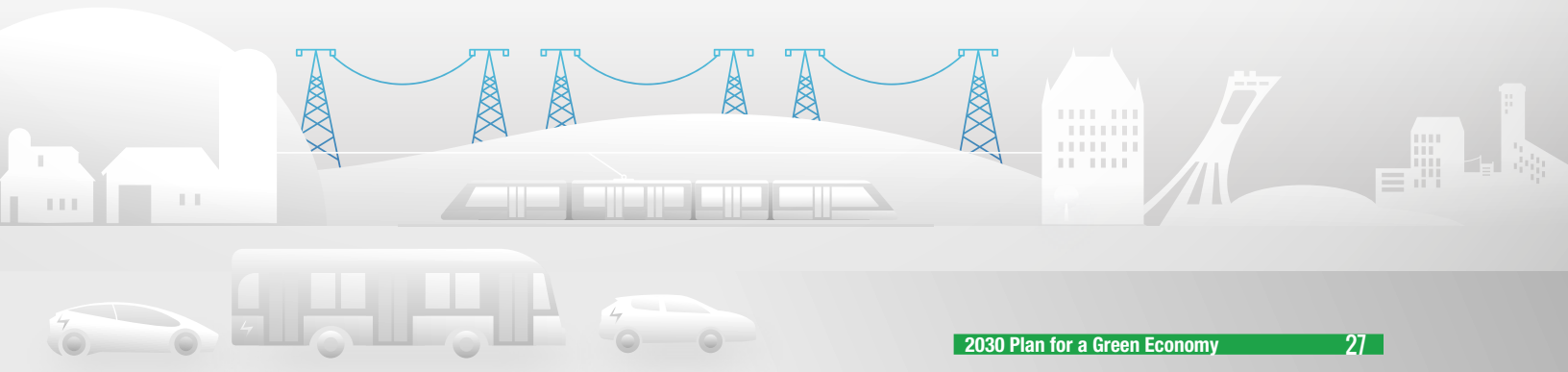
The ambitious project proposed by the **2030 Plan for a Green Economy** is not limited to government action; it will need to be a collective effort, fuelled by the contributions of all parts of society.

3.1 Principles to guide government action

The **2030 Plan for a Green Economy** is part of an orientation towards sustainable development.

As the framework policy on climate change, it is founded on nine principles that guide the government's action.

- Electrification and the fight against climate change are major levers for economic development and the creation of wealth.
- Electrification and the fight against climate change must maximize the reduction of greenhouse gas emissions across Québec while taking advantage of the flexibility offered by the carbon market.
- Electrification and the fight against climate change are grounded in the efficient use of energy and resources.
- Everyone is responsible for electrification and the fight against climate change.
- Electrification and the fight against climate change must be implemented with a positive approach that highlights the gains to be made and generates the motivation we need to get there.



- Electrification and the fight against climate change objectives will need to be integrated into government orientations, policies, and strategies.
- For both electrification and the fight against climate change, the government intends to act pragmatically, rigorously, and effectively, using a science-based approach and prioritizing results while accounting for the future climate and the realities of the various areas of intervention.
- The government's vision of electrification and the fight against climate change is not limited to Québec. The Plan must ensure that Québec contributes beyond its borders.
- Electrification and the fight against climate change must ensure a just transition for society as a whole and factor in the specific realities of each of Québec's regions.

A just transition

The success of the climate transition requires the cooperation of the entire population. Ensuring a just transition involves supporting the actors in society who will be most directly affected by transition measures, as well as those who will feel the impacts of climate change most intensely. The concept of "just transition" plays a key role in ensuring their cooperation.

As part of the 2030 Plan for a Green Economy, just transition will be achieved through measures like supporting economic sectors and the workforce so that they can seize the opportunities emerging from the climate transition and, if necessary, limit its impact on competitiveness and employment.

The just transition will also aim to provide citizens with options and choices for reducing their greenhouse gas emissions while taking the impact of measures into consideration.

In terms of adaptation, interventions will focus on the most significant short- and long-term risks while accounting for the specific situations of different regions and groups.

Since applying this just transition will contribute to shaping a more resilient and equitable society for future generations, intergenerational equity will be an important factor.

Ongoing dialogue with the community will make it possible to understand the concerns of stakeholders and to implement the Plan while ensuring a just transition.

3.2
An evolving implementation

Over a ten-year horizon, the **2030 Plan for a Green Economy** will be deployed with a five-year implementation plan that will be updated annually to always cover the following five years.

It's impossible to precisely predict what technological advances will bring, nor is it possible to truly know what the carbon market, the global economy, public acceptance, or even lifestyles will look like in the future.

Therefore, by updating this implementation plan and its investments annually, the government will be able to adjust its actions based on factors like progress, the economic context, and advances in technology and knowledge. This will ensure that decisions and actions remain both relevant and effective.

The major changes that Québec has committed to take time, and the initial actions will lay the foundations on which we will build during future updates of the implementation plan. The environmental, social, and economic gains will therefore increase over the years.

3.3
Collective efforts

The fight against climate change is significant and calls for the contributions of everyone.

Achieving the 2030 target for the reduction of greenhouse gas emissions and making progress in terms of economic development and climate change adaptation will only be possible through concerted effort and the participation of all parts of Québec society.

Everyone must hear the call, feel committed, and contribute to the best of their abilities. Progress will only be possible if everyone supports the choices that need to be made now and in the coming years.

Climate change concerns and challenges all stakeholders. It requires everyone to take action, and that goes hand in hand with making citizens, companies, organizations, and governments accountable.

The Québec government's actions will be enhanced by the commitment of its citizens, municipalities, researchers, and companies, whose initiatives will be solicited and supported. In particular, all municipalities will be encouraged to develop their own climate change plans that complement the **2030 Plan for a Green Economy**.

The federal government will also have to make a significant contribution to the collective effort, particularly as part of Canada's commitments to fighting climate change.

The government intends to bring together initiatives that contribute to the fight against climate change and ensure that they reach their full potential.

4.

OUR CLEAN ELECTRICITY: AN INVALUABLE ASSET

Québec's has some of the most carbon-efficient energy generation in the world, with more than 99% of its energy coming from renewable sources, mainly hydroelectricity. Québec ranks fourth in the world in hydroelectric generation, after China, Brazil, and the United States.

In addition, thanks to low generation costs, Québec has some of the most competitive electricity rates in North America.

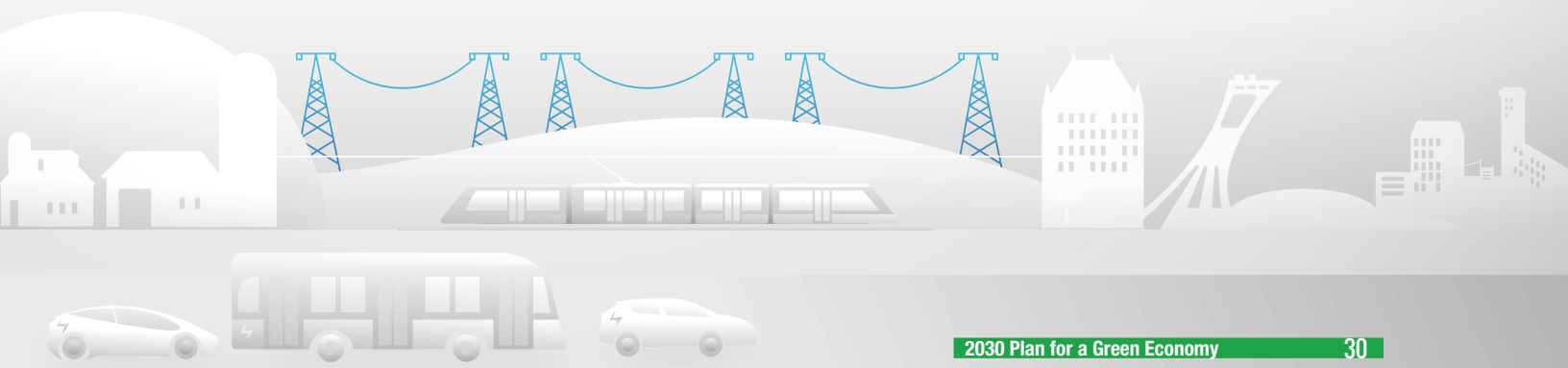
Efforts to improve energy efficiency and reduce demand at the source will further enhance the value of this precious resource as we gradually replace fossil fuels with clean, renewable electricity.

In the coming years, the government and Hydro-Québec will rely on rigorous planning to ensure a clean, renewable electricity supply that meets the needs arising from the increased electrification of Québec's economy, as well as the intent to develop a green hydrogen industry. This planning will also consider Québec's desire to increase electricity exports as a means of supporting the decarbonization of northeastern America while generating wealth.

Contributing to the decarbonization of Québec and its neighbours in the long term

Québec is equipped with significant assets and resources when it comes to renewable energies. Over the next few years, multiple levers could bring us further, allowing electricity to have a structural impact for the decarbonization of Québec and its neighbours. The levers in question include:

- Improving energy efficiency, which will increase the amount of energy available;
- Increasing the transmission capacity to move our electricity to neighbouring markets;
- Adding electricity generation capacity, particularly through Québec's wind power industry and other renewable energy sources.



Managing peak demand

Despite the current availability of electricity, the impact of peak demand must be taken into account.

“Peak demand” describes the short periods throughout the year when demand is at its highest. Hydro-Québec must ensure that its generation, transmission, and distribution assets are sufficient to meet this peak demand, even if it occurs occasionally.

When peak demand increases, Hydro-Québec must invest in additional infrastructure, even if its existing assets are sufficient for the rest of the year.

In implementing the **2030 Plan for a Green Economy**, attention will be paid to reducing peak demand and encouraging the use of electricity outside of peak demand hours.

Ultimately, this will help postpone or even avoid investments in the grid or supply. The power saved by doing so could be used in Québec or sold to neighbouring markets, both of which would benefit all Quebecers. That would allow Québec to give itself the means to maximize its electrification potential and keep rates as low as possible.

The contribution of other renewable energies

Other renewable energies, like green hydrogen and bioenergies, can also be used to complement electrification in order to reduce greenhouse gas emissions.

Deploying other renewable energies as a complement to hydroelectricity has the potential to accelerate the energy transition, particularly when it comes to managing peak demand and limiting the construction of new energy infrastructures.

Green hydrogen and other renewable energies, such as bioenergies, will help replace fossil fuels in the industrial and transport sectors (particularly the heavy and long-distance transport sectors) and in building heating.

Green hydrogen is made from our clean electricity which means that it allows part of our economy to be electrified indirectly. It can help decarbonize areas where direct electrification is not technically or economically feasible.

It is in Québec’s best interest to invest in green hydrogen now, as it is a next-generation energy solution. The first pilot projects should begin at once to allow for more widespread deployment by 2030 and beyond.

The government will also rely on the development of bioenergies. These include renewable natural gas, which has the potential to be injected into the natural gas network and “green” that form of energy; residual forest biomass, which could be used for heating; and biofuels, which could be used in transport.

PART ONE

MITIGATING CLIMATE CHANGE

With the **2030 Plan for a Green Economy**, the government is prioritizing the electrification of Québec's economy, by electrifying areas that can feasibly be electrified given technical and economic realities. In areas where electrification is not possible, other renewable energies will play a complementary role in reducing greenhouse gas emissions. Finally, solutions will also involve improving energy efficiency and transforming certain ways of doing things.

Mitigation efforts will extend to all sectors, including transport, industry, and buildings. Other actions will target the agricultural sector, waste management, and the protection of natural environments. Electricity generation, and improving access to this important energy source, will also be covered.

Overall, the approach to climate change mitigation will follow a specific hierarchy: avoid, reduce, sequester.

Mitigating climate change: avoid, reduce, sequester

Prioritizing actions

For an optimal climate transition, actions to mitigate climate change will need to follow a specific hierarchy: avoid, reduce, sequester.

This hierarchy emphasizes the need for preventive action and the potential for reducing greenhouse gas emissions at a lower cost. It promotes efficient energy use and favours energies with low greenhouse gas emissions, including Québec's own electricity.

Avoid

Mitigating climate change requires upstream efforts to avoid creating new greenhouse gas emissions as much as possible, limit emissions from new sources, and prevent the destruction of natural carbon pools. This means that we need to ask ourselves what defines a need as "essential." Furthermore, projects must be optimized right from the design stage, favouring renewable energies and materials that have low carbon footprints. Improving land use planning and updating regulatory frameworks may also be ways of avoiding new greenhouse gas emissions.

Reduce

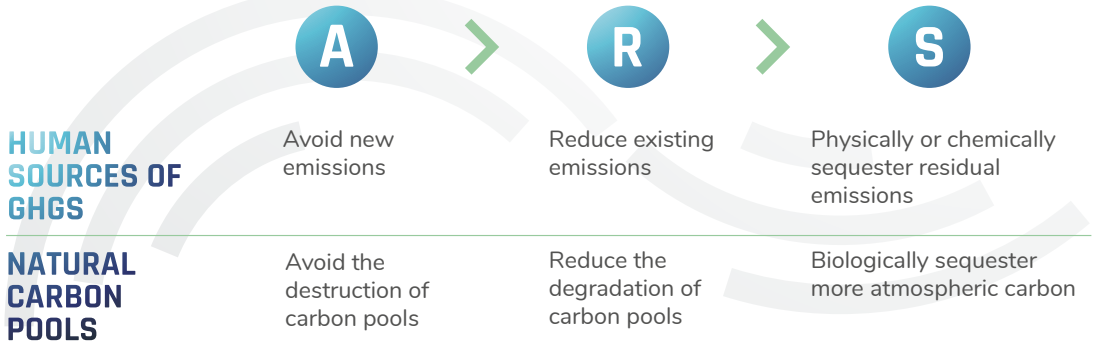
After avoiding new emissions, mitigating climate change involves reducing existing greenhouse gas emissions and limiting the degradation of natural carbon pools. Mitigation measures will contribute to this step by supporting the conversion to renewable energies with low greenhouse gas emissions, improving energy efficiency, and improving practices and processes.

Sequester

Finally, we can sequester the greenhouse gas emissions that we were not able to avoid or reduce.

In some cases, greenhouse gases can be sequestered using carbon capture and storage technologies so that they cannot harm the climate. Sequestration can also be a natural process, as ecosystems remove existing greenhouse gases from the atmosphere and incorporate carbon into biomass. While we first need to prevent natural carbon pools from being destroyed and limit their degradation, we can also increase the biological sequestration of carbon by creating new carbon pools, particularly in forests.

CLIMATE CHANGE MITIGATION HIERARCHY



Greenhouse gas emissions can also be offset in situations where interventions have reached their limit.

Offsetting greenhouse gas emissions can play a supporting role in mitigating climate change.

To be consistent with the mitigation hierarchy, the climate transition will need to account for carbon lock-ins. These lock-ins may occur if significant investments are planned for infrastructures with long lifespans or sectors that are major emitters of greenhouse gases, which could run counter to climate change mitigation objectives. In the context of the fight against climate change, the viability and profitability of these investments could be compromised.

1.

TRANSPORTATION

The government intends to build on the clean, abundant, and affordable electrical energy available in Québec to launch a major electrification endeavour in the transport sector.

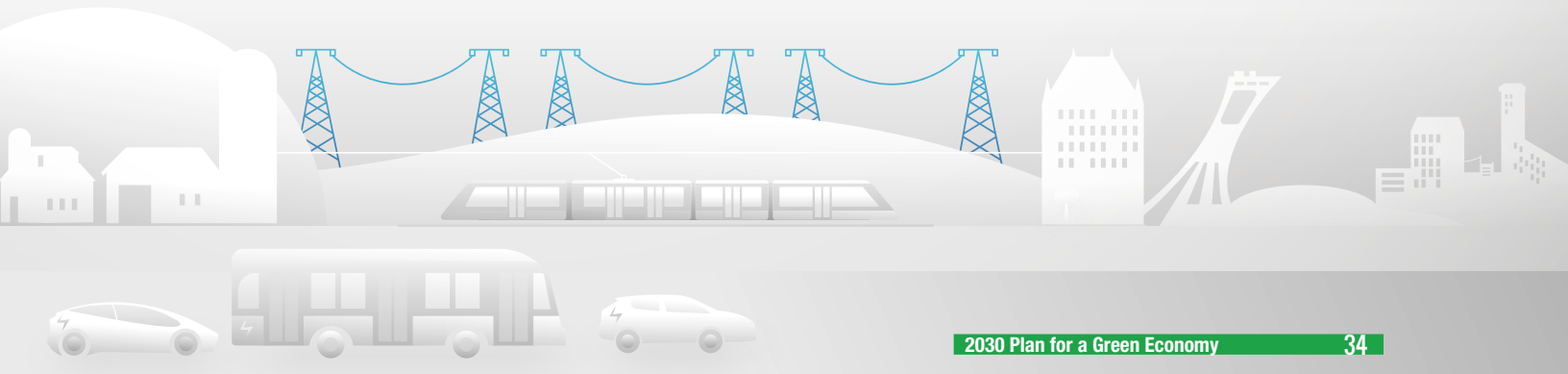
This sector is the leading emitter of greenhouse gases, and it relies heavily on imported fossil fuels. The fact that Québec businesses are active in the field of transport electrification (producing trucks, buses, batteries, specialty vehicles, charging stations, and more) will maximize the economic benefits of electrification.

Changes to sustainable mobility will continue and land use planning will be rethought, with the intent of reducing travel at the source. The latter will account for new realities and practices, including the more widespread reliance on remote work.

Finally, the government will become a role model in acquiring vehicles for its fleets.

Highlights

- 43.3% of greenhouse gas emissions in 2017 (most emitting sector)
  - 79.6% attributable to road transport
- 23% increase in greenhouse gas emissions from 1990 to 2017
  - Increase in the number of vehicles per capita
  - Growing consumer preference for large vehicles
  - Marked increase in road freight transport (emissions tripled)
- Heavy dependence on oil



1.1 A major electrification endeavour

Québec will be taking vigorous action to electrify the transport sector.

In particular, the government will focus on electrifying public transportation, light vehicles, and heavy and specialty trucks, and on deploying charging infrastructure.

Complementary contributions from other energies

While this endeavour is far-reaching, it cannot fully eliminate the consumption of petroleum products in the transport sector.

The government will therefore promote the increased use of renewable fuels in transport, with blend requirements **reaching 15% of gasoline and 10% of diesel by 2030**. This will further reduce the sector's greenhouse gas emissions.

Eventually, green hydrogen will be able to supplement these efforts—an indirect way to electrify the sector if that hydrogen is produced from our clean electricity.

1.1.1 Electrifying public transportation

Electricity already plays a major role in Montréal's public transportation system thanks to the metro. It is estimated that the metro prevents 2.7 million tons of CO_2 equivalent per year in greenhouse gas emissions by reducing vehicle traffic, alleviating congestion, and improving urban densification.

The government has already committed to major electric public transportation projects, such as the Réseau express métropolitain and the extension of the Montréal metro's blue line. With the **2030 Plan for a Green Economy**, the government is furthering that effort.

Structuring projects for electric public transit

The government is firmly committed to carrying out several structuring public transit projects in Québec's urban regions.

These projects will all be electric and maximize local benefits, all while respecting international trade agreements.

City and school bus transport

The government is furthering the shift already underway in public transportation funding, which aims to ensure the electrification of buses. There are nearly 4,000 city buses and more than 10,600 school buses currently in circulation in Québec that could eventually be powered by electricity.

Hybrid city buses are already operating across Québec and a few fully electric buses have already emerged. These buses are proving their worth in transport systems and will gradually be able to expand on a larger scale.

As of 2025, all new buses that are acquired by public transit companies and covered by government financial assistance will be electric. **The government wishes that by 2030, electric buses account for 55% of all city buses in Québec**.

In addition to replacing buses with electric models, plans will need to be made to develop charging infrastructure and prepare transit companies' garages and maintenance centres. This includes ensuring they have enough power supply.

Specific initiatives will also be put in place to accelerate the acquisition of electric school buses. This is a promising avenue for improving Québec's environmental record while educating the next generations about environmental issues. **The government intends for electric buses to account for 65% of all school buses in circulation in Québec by 2030**.

Electrifying school buses, like city buses, will support an emerging economic sector in Québec. The government will ensure that this industry develops in a structured manner, while taking its production capacities and players' financial stakes into account.

1.1.2 Electrifying light vehicles and building a charging infrastructure

The government wishes to accelerate the electrification of light vehicles so that electric vehicles can soon make up a significant proportion of all light vehicles on the roads. The movement has begun, but it is still too slow. **The government aims to have 1.5 million electric vehicles on Québec's roads by 2030**.

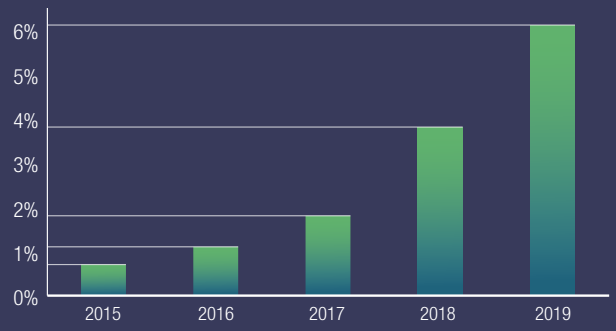
This desire to accelerate electrification is part of a long-term perspective, one that extends beyond 2030. **The government's intention is that electric and other zero-emission vehicles will account for 100% of motor vehicle sales by 2035, and that the sale of gas-powered vehicles will be prohibited**. California and British Columbia share this vision. Together, these three regions will work to establish an alliance with other Canadian provinces and American states to support the supply and demand of these vehicles. This will help create a large North American market and ensure a continent-wide supply chain.

Electric vehicles in Québec

Québec has the most electric vehicles on the roads in Canada. As of December 31, 2019, there were more than 66,000 registered electric vehicles in Québec[8]. This is due to the introduction of financial incentives for acquiring and leasing electric vehicles, the establishment of a network of charging stations, and the adoption of a standard for zero-emission vehicles that encourages manufacturers to offer them.

In 2019, 6% of newly registered passenger vehicles were electric, compared to just 0.7% in 2015. That said, personal electric vehicles still accounted for only 1.3% of all light vehicles in 2019.

FIGURE 5
Newly registered electric vehicles – Québec – from 2015 to 2019 (as a percentage of the total number of newly registered vehicles)



Sources: Société de l'assurance automobile du Québec and Statistics Canada.

8. Société de l'assurance automobile du Québec.

Four obstacles

While purchasing an electric vehicle has many advantages, the widespread adoption of those vehicles still faces four obstacles:

- The cost of buying or leasing electric vehicles without government assistance is still too high compared to similar gas-powered vehicles.
- The supply is still insufficient and not diversified enough, and existing vehicles are not always available.
- The range of electric vehicles generally remains lower than that of gas-powered vehicles.
- The available charging infrastructures don't always meet drivers' needs.

Necessary interventions

The government will continue with incentives to reduce price gaps when purchasing or leasing electric vehicles. These incentives will be adjusted as the market evolves.

In order to ensure that a sufficient number and variety of electric vehicles are available, the government also intends to strengthen its standard for zero-emission vehicles, the ZEV standard, which prompt manufacturers to offer those vehicles. In doing so, the government will be contributing to its collective efforts with other jurisdictions to grow the North American market for zero-emission vehicles.

The availability of new models—featuring greater ranges thanks to technological innovations—will allow the market to better meet buyers' needs.

As for charging stations, Québec is already showing leadership when it comes to availability. However, the current infrastructure does not necessarily meet the needs of some drivers, such as those living in multi-unit buildings or those who need to park on the street. Furthermore, few people are familiar with the network of public charging stations, and in some areas, that network is insufficient.

The government will therefore increase its efforts to install charging stations to better meet electric vehicle drivers' needs and build confidence in the availability of charging stations in rural and urban areas alike.

As such, the government is mandating Hydro-Québec to increase the number of fast-charge stations to 2,500 by 2030, in line with the target of having 1.5 million electric vehicles on the roads by that time. The network of standard charging stations will also be strengthened as part of the Electric Circuit, with the goal of making charging stations more accessible in urban areas. **In collaboration with the relevant municipalities and municipal organizations, Hydro-Québec will roll out up to 4,500 standard charging stations, mainly in city centres**.

Expanding the network of public charging stations, especially fast-charging stations, directly encourages the adoption of electric vehicles, in addition to benefit Québec's charging infrastructure industry.

Electric vehicles: an advantageous choice

Electric vehicles are more expensive to buy or lease than gas-powered vehicles, which can dissuade consumers. However, given the savings associated with operating them and purchase rebates through programs like the Government of Québec's Roulez vert, electric vehicles become an advantageous choice.

The rebates offered by the governments of Québec and Canada ($8,000 and $5,000, respectively, in 2020) significantly reduce the additional cost of purchasing an electric vehicle. For instance, if a household were to purchase a Nissan Leaf®, it would cost approximately $17,725 more than a gasoline-powered vehicle in the same class, such as the Nissan Altima®. However, they would receive a $13,000 rebate, since the Nissan Leaf® qualifies for the programs in Québec and Canada.

Moreover, over a five-year period, the electric vehicle would save over $7,500 in energy costs and over $1,800 in maintenance costs. As a result, mainly thanks to the rebates available, the electric vehicle's total cost over five years would be approximately $3,800 lower than that of a comparable gas model.

In addition to the savings mentioned above, a couple using an electric vehicle will reduce their greenhouse gas emissions by 3.7 tons of CO_2 equivalent per year. That reduction represents 19.5% of an average Quebecer couple's emissions, which amount to 19 tons[9] of CO_2 equivalent.

TABLE 1
Five-year cost comparison for a Nissan Leaf® and a Nissan Altima® (in 2020 dollars, unless otherwise indicated)

	Nissan Altima® SV	Nissan Leaf® S Plus	Difference
Purchase cost			
Vehicle cost(1)	38,565	56,290	17,725
Rebates(2)	–	-13,000	-13,000
Subtotal	**38,565**	**43,290**	**4,725**
Cost of charging station(3)	–	895	895
Energy costs over 5 years(4)	9,640	2,080	-7,560
Maintenance costs over 5 years(5)	1,840	–	-1,840
TOTAL	**50,045**	**46,265**	**- 3,780**
GHG emissions per year (t. CO_2 eq.)	**3.7**	**0.007**	**3.7**

(1) The cost includes the manufacturer's suggested retail price, plus fees and taxes.

(2) The Québec government is offering an $8,000 rebate and the federal government is offering a $5,000 rebate.

(3) The cost includes the $600 Roulez vert rebate for the purchase of a home charging station.

(4) The distance travelled is 20,000 km/year. The price of a liter of gasoline is the average price in 2019 in Québec, i.e. $1.22 (with taxes). The price of a kilowatt hour (kWh) corresponds to that of the second Rate D tier, i.e., 10.79¢/kWh (with taxes).

(5) The cost includes taxes, as well as oil changes ($68.99/10,000 km) and brake changes ($574.88 per 50,000 km for the gas vehicle and per 120,000 km for the electric vehicle).

Sources: Innovative Vehicle Institute, www.nissan.ca, U.S. Department of Energy, Hydro-Québec, Régie de l'énergie du Québec, and Ministère des Finances

9. Calculated on the basis of average per-capita emissions, i.e. 9.5 tons CO_2 equivalent per person according to the *Inventaire québécois des émissions de gaz à effet de serre en 2017 et leur évolution depuis 1990*.

Taxis and commercial vehicles

Further initiatives will target taxis, **with the aim of having 40% of taxis be electric by 2030**. In Québec, the 11,000 or so taxis currently in operation (all categories combined) travel an average of 70,000 km per year and emit five to six times more greenhouse gases than a private vehicle. Electrifying these vehicles therefore offers good potential for reducing greenhouse gas emissions.

Efforts to electrify light vehicles will also extend to companies with fleets that can be electrified. Those efforts will need to take into account the fact that commercial fleets may contain both light and heavy vehicles.

1.1.3 Electrifying trucks

Québec has more than 150,000 heavy vehicles, the majority of which may be electrified. This is particularly true of straight trucks (cargo container attached to the cab), which make up 60% of registered heavy vehicles. Thanks to technological advances, such as increased range due to improved battery capacity, new solutions to electrify truck fleets are now within reach.

That said, electrification still faces obstacles for some applications. Some of those obstacles are economic, others are technological, and yet others have to do with vehicle availability. All can only be overcome in the medium term.

Available and developing solutions

Recent technological innovations have made it possible to buy fully electric, Québec-made trucks.

In particular, fossil fuel technologies can be replaced by electric technologies in commercial vans and delivery trucks of varying sizes. These are vehicles that generally make multiple short trips through a city, for instance along courier or delivery routes, before returning to their home port for daily recharging. Whether these trucks are light or heavy, they have the potential to be electrified.

Furthermore, the trucks to be electrified don't just carry goods. Various types of specialized trucks (such as waste collection trucks, aerial bucket trucks, tool trucks, fire trucks, and ambulances) also present major opportunities for electrification, through existing and emerging hybrid or all-electric solutions.

The electrification process will be more gradual for long-haul heavy trucks, as they require a much greater range because of their long trips and heavy loads. Further challenges are related to the size of the territories they need to cover and the need for charging stations throughout those territories. Several demonstration projects with electric trucks are currently underway in North America, so the opportunities will become more numerous in the medium term.

Additionally, green hydrogen fuel cells could become an alternative to batteries when the conditions are right. Consideration of this possibility should include consideration of the necessary refuelling infrastructure.

Government support

In areas where the technology remains available but expensive, the government's support will include assistance to reduce the cost of purchasing the vehicles. At the same time, the government will be supporting Québec's electric truck manufacturing industry.

In areas where the technology is emerging or non-existent, the government will support innovation and demonstration in order to actively participate in the development of Québec-made electrification solutions that are suited to heavy transport. The government's support will also focus on the implementation of these new technologies in the sector.

1.1.4 Electrifying other modes of transport

Opportunities to electrify the air, marine, and rail freight transport sectors will come over a somewhat longer horizon than those for road transport.

Nevertheless, as knowledge and technology advance, electrification will be encouraged for these modes of transport.

In addition to electrification, efforts to make those modes of transport more efficient and to have them use less-polluting forms of energy will be pursued in order to reduce their greenhouse gas emissions.

1.2 Rethinking travel sustainably

Land use planning is an important lever for reducing energy demand and facilitating the transition to a low-carbon economy. For instance, densification, optimal management of urbanization, and integrated planning will help reduce greenhouse gas emissions from the transport sector.

The increased reliance on remote work also needs to be considered, as it reduces travel and the associated greenhouse gas emissions.

The transport of people and goods must take a broader perspective into account—one that focuses on sustainable mobility, which in turn is based largely on land use planning.

The government is also continuing to deploy the Sustainable Mobility Policy – 2030, based on the "reduce, transfer, improve" approach, and is maintaining its targets.

The "reduce, transfer, improve" approach

The "reduce, transfer, improve" approach aims to encourage a change in people's travel habits through better land use planning and more transportation options. The goal is for people to adopt travel habits that involve more sustainable modes of transportation.

The "reduce, transfer, improve" approach is based on three stages that should be prioritized as follows:

- Reduce motorized trips and travelling distances by better integration of land use planning and transportation;
- Transfer trips to less energy-consuming means of transportation that translate into lower greenhouse gas emissions, such as public or active transportation;
- Improve the efficiency of vehicles by reducing their greenhouse gas emissions, particularly through electrification, but also improve trips in terms of costs and safety.

Source: Ministère des Transports (2018). *Transporting Québec Towards Modernity – Sustainable Mobility Policy – 2030*.

1.2.1 Land use planning: using a revised approach to plan low-carbon living environments

The government will revise its approach to sustainable land use planning so that it can better contribute to meeting the targets for reducing greenhouse gas emissions.

For instance, denser living environments designed around public transportation routes will reduce travel times and distances. Thanks to this densification, as well as urban planning designed with user safety in mind, people will be able to make many trips actively, either on foot or by bicycle, which will improve air quality and bring health benefits as well.

The government will also be reviewing the way land is developed. The aim will be to provide Québec with a coherent, comprehensive vision of land use planning and urban development in order to guide the actions of its government, its cities, and other members of civil society.

These actions will, among other things, help optimize the management of urbanization, in particular by densifying current living environments and preserving agricultural land and natural spaces.

Municipalities will also receive support to identify solutions for reducing greenhouse gas emissions that they can implement locally and to monitor the results of those solutions, and receive guidance towards relevant programs. The government will also support municipalities in the development of low-carbon living environments.

1.2.2 Remote working to reduce travel at the source

An increased reliance on remote work could help lower greenhouse gas emissions by reducing travel.

While remote work itself is not new, it became more prominent during the COVID-19 pandemic as a way for many organizations to continue operating.

It is still too early to identify specific trends or determine what role remote work will play in the long term, but it will certainly be a factor to consider in the fight against climate change by 2030.

However, while it does have environmental benefits, long-term reliance on remote work may give rise to issues for companies, workers, urban sprawl, and the vitality of city centres. All of those will need to be taken into account.

1.2.3 Sustainable mobility for passenger transport: cutting back on solo vehicles

With sustainable mobility, the government wants to reduce the need for travel at the source and encourage the replacement of solo vehicles with other means of mobility: public transportation, active transportation, and shared transportation.

These modes of transport reduce greenhouse gas emissions. They also improve traffic congestion, air pollution, socio-economic costs, health, and quality of life.

All three alternatives will only be viable if they meet people's expectations regarding travel time, ease of use, comfort, and safety. As a result, the government's efforts will be focused on improving the quality, quantity, and variety of these solutions.

By combining several modes of transport, Québec can become more energy-efficient, reduce traffic, and lower greenhouse gas emissions from personal travel.

Public transportation

Public transportation will be able to count on substantial funding as it continues to develop.

The government will increase the percentage of investments in public transportation compared to those in road development. In particular, considerable investments will be made in the construction of electrified structuring public transportation systems.

Active and shared transportation

In terms of active transportation, it is imperative to create urban environments that are conducive to walking and cycling. That involves developing safe infrastructure and planning land use in a way that reduces travel distances.

The government will be supporting those efforts at the municipal level. After all, municipalities play an important role in developing infrastructure that not only meets pedestrians' and cyclists' needs, but keeps them safe.

As for shared transportation, the development of the sharing economy and exploiting the potential of information technology will further reduce reliance on solo cars.

1.2.4 Sustainable mobility for freight transport: focusing on intermodality

The shift towards sustainable mobility also involves changing the way goods are transported.

To that end, the government intends to rely on intermodality and multimodal networks to minimize the number of goods being carried by truck.

Its approach will focus on developing integrated, optimized multimodal networks and optimizing logistics chains in order to reduce the number of heavy vehicles on the roads. This will allow the sector to favour rail and marine transport over road transport, thereby reducing its greenhouse gas emissions.

In particular, the government is counting on using water transport to increase the collective wealth of Quebecers and open new avenues for growth and prosperity. Naturally, marine ecosystems will be respected despite the increased reliance on water transport. On average, water transport emits eight times fewer greenhouse gases per ton of goods transported than road transport[10].

The government will promote the use of short water transport, facilitating the modal shift from road to water for certain applications.

10. Source: Ministère des transports (2013). *Environmental and Social Impacts of Marine Transport in the Great Lakes-St. Lawrence Seaway Region*, Research and Traffic Group, (figure ES4), 20 p. https://www.marinedelivers.com/wp-content/uploads/2018/12/Environmental-Benefits-Study-Full-Report.pdf

1.3 Government as a role model

Nearly 25% of greenhouse gas emissions from Québec government activities come from the use of fossil fuels in government ministries' and agencies' vehicles.

In managing its fleet of light vehicles, the government will set an example by prioritizing electrification and reducing its greenhouse gas emissions.

As such, **the government is committed to ensuring that all government cars, vans, minivans, and sport utility vehicles (SUVs), as well as a quarter of its pickup trucks, are electric by 2030**.

At the same time, it will use a coordinated approach to strengthen the network of charging stations in government buildings.

It will also work towards electrifying its heavy truck fleet. The government will evaluate the potential for integrating electric trucks based on use.

By more actively electrifying its fleets and adding charging stations, the government will lead by example and encourage others to do the same. These actions will also serve as an important driver for emerging sectors and promote the development of solutions that can be used by Quebecers businesses while enhancing Québec's international reach.

Finally, the government will be measuring the effects of a structured remote work program for its employees on its greenhouse gas emissions.

2.

INDUSTRIES

The government's efforts will be aimed at making our industries emit less carbon and become more competitive at the same time.

To do so, the government will provide customized support for large industrial emitters and implement measures to encourage investment in emission reduction projects.

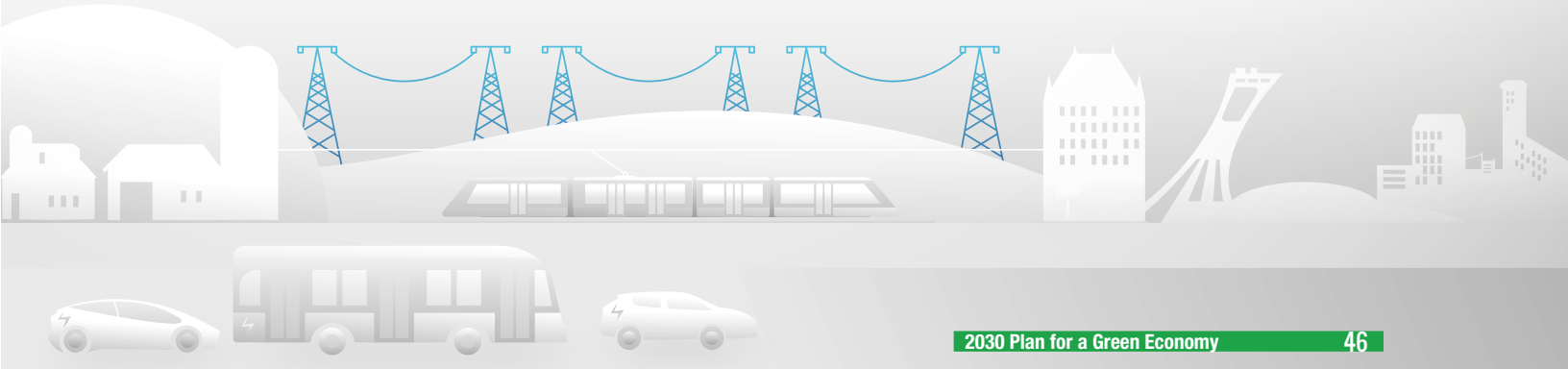
New industrial projects will also be an opportunity for Québec to build and establish green, competitive facilities.

Innovation will be further supported so that new methods and techniques can be implemented.

Electricity is already a well-established part of Québec's industrial production, but it is not a one-size-fits-all solution. Other energy sources will therefore also be used, efficiently, and with an emphasis on the least polluting solutions.

Highlights

- 30.5% of greenhouse gas emissions in 2017 (2nd most emitting sector)
  - 52.6% from industrial processes
  - 46.8% from the use of fossil fuels for energy purposes
- 25% decrease in greenhouse gas emissions from 1990 to 2017
  - Conversion to more carbon-efficient energies
  - Improvement of processes
  - Restructuring of some industries
- Large industrial emitters (in 2017)
  - 73 industrial facilities subject to the carbon market
  - 23% of greenhouse gas emissions
  - Approximately 1/3 of manufacturing GDP



2.1 Reducing greenhouse gas emissions while increasing companies' competitiveness

The challenges posed by the climate transition also serve as a unique opportunity for the industrial sector to invest in innovative approaches and more sustainable practices with government support. Through those investments, Québec industry will be better positioned in the lower-carbon economy of tomorrow. This will make the sector more competitive and serve as a major draw for customers.

2.1.1 Adjusting rules for the carbon market and encouraging private investment

Large industrial emitters of greenhouse gases are subject to the carbon market, which grants them a certain number of free emission allowances.

These free allowances are granted to large industrial emitters that are facing international competition. The goal is to allow these emitters to remain competitive while encouraging them to avoid relocating to places with less stringent environmental standards.

New rules for free allowances

The government will announce new rules on free allowances for the 2024–2030 period. The new approach is intended to:

- Ensure that the industrial sector contributes to the 2030 target for reducing greenhouse gas emissions by reducing its free allowances;
- Reduce greenhouse gas emissions in Québec to the greatest extent possible; and
- Allow the industrial sector to remain competitive while accounting for factors such as changes in carbon pricing elsewhere in the world.

Companies will need to make significant efforts that are aligned with greenhouse gas reduction objectives. At the same time, those companies will benefit from a predictable and stable environment to make the necessary investments.

An innovative mechanism

The government intends to go further to encourage large industrial emitters to invest in reducing their greenhouse gas emissions in Québec.

In particular, it will provide a mechanism to auction off some of the emission allowances allocated freely to emitters. Under this mechanism, as of 2024, companies that are eligible for free allowances will collect funds in return for the reduced allocation.

Businesses will need to use those funds to invest in reducing greenhouse gas emissions, either directly or through research and development projects.

This new approach will provide greater predictability for businesses when it comes to investment. It will be in their best interests to take advantage of the incentive, which will allow them to increase productivity as well. At the same time, that incentive will serve as an unprecedented lever for investment in reducing greenhouse gas emissions in Québec.

Appropriate financing tools will be put in place to accelerate these investments, rather than waiting for money to accumulate from 2024 onwards. This will allow the economic and environmental benefits to materialize as soon as possible and accelerate businesses' low-carbon shift in the short term.

Tailoring support

Large industrial emitters account for a significant share of Québec's economy, but also its greenhouse gas emissions. Consequently, it is essential to closely support those businesses, encouraging them to invest in solutions that contribute to Québec's greenhouse gas reduction target while stimulating economic development.

The government will focus on customized support based on improved knowledge of companies' ability to reduce their greenhouse gas emissions. This will be used to direct them towards the best financial tools for their situation. It will also adopt a proactive approach to remove as many obstacles as possible to emission reduction projects in the industrial sector.

In particular, companies will have to document their technical and economic potential for reducing greenhouse gas emissions in order to assess the investments to be made.

2.1.2 Applying existing solutions and investing in innovation

The nature of the investments to be made differs widely from one company and sector to the next.

Existing businesses

The government will encourage existing businesses to invest in reducing their energy consumption through efficiency and heat recovery measures, as well as in replacing fossil fuels with renewable forms of energy.

The government will promote the adoption of energy management systems, the implementation of energy efficiency plans and projects, and the use of renewable energy.

It will also encourage heat recovery in industries, as reducing energy consumption lowers both greenhouse gas emissions and production costs.

New projects

New projects need to seize the opportunity to incorporate more energy-efficient equipment and favour renewable energy sources (where possible) when building and establishing new facilities.

These projects will need to prioritize energy-efficient choices. The goal is to encourage companies to focus on optimizing energy efficiency and greenhouse gas emissions, and building that optimization into the design right from the start. The use of energy-efficient equipment and renewable energies will grant companies a competitive edge in an increasingly low-carbon economy.

Greenhouse gas emissions are already included in the approval process for large industrial projects subject to the environmental impact assessment and review procedure. The government intends to extend this accountability for greenhouse gas emissions to some smaller projects.

For these projects, promoters will likely be required to demonstrate that they have considered the greenhouse gas emissions from their project and attempted to minimize them by choosing the best economically viable technologies.

Innovation

Innovation will be supported to design solutions that don't yet exist, particularly when it comes to developing new, more carbon-efficient industrial processes.

Reducing greenhouse gas emissions from industrial processes relies heavily on "disruptive technologies," so called because they bring about a significant change in the way things are done and generally replace traditional technologies.

Promising possibilities exist, but it is not certain that concrete results can be achieved before 2030. The government will support research and innovation to develop these technologies for the future.

The ELYSIS project is involved in developing disruptive technologies in the aluminum smelting sector. It is just one example of a process that the government will be supporting with the **2030 Plan for a Green Economy**.

ELYSIS: aluminum without greenhouse gases

The ELYSIS project, which is supported by the Government of Québec, aims to develop a promising disruptive technology to reduce greenhouse gas emissions in industrial processes. Manufacturing companies are being forced to find solutions to decarbonize their production lines and industrial processes as they adapt to increasingly strict regulations on greenhouse gas emissions.

In May 2018, Rio Tinto and Alcoa announced a revolutionary new aluminum smelting process that produces oxygen and eliminates the direct greenhouse gas emissions from the traditional smelting process.

If fully implemented in existing aluminum smelters, the ELYSIS technology could eliminate more than 5 million tons of CO_2 equivalent per year in Québec.

Source: https://www.elysis.com/en.

2.2 Prospects for electrification and the use of alternative energies

Electricity is already a major part of most industries and large businesses, such as in the aluminum and pulp and paper sectors, but it is used very differently in each sector.

It is therefore crucial that Québec companies continue to have access to this resource at a competitive price and that new technologies be developed to allow its use in even more processes.

Increased electrification

Québec's industrial sector is made up of a wide variety of companies of all sizes, belonging to very different sectors and using a diverse array of processes and technologies.

Furthering the electrification of industrial processes is not necessarily possible in every sector; electrification still faces technological hurdles in areas where further research is needed.

In some situations, electricity may also have a higher cost compared to other forms of energy, including natural gas, and this creates a further barrier to adoption.

Solutions for today and tomorrow

Companies in the industrial sector have an incredibly wide range of activities and vary greatly in size. As such, the processes and activities with the best potential for electrification in the short, medium, and long term will have to be identified and periodically re-evaluated. After all, processes and activities that were considered impossible to electrify in the past can be electrified today or become electrified in the future.

The government will prioritize actions in areas where technologies are already in place and have the best potential for electrification. At the same time, it will accelerate research and development activities in areas where the technologies are still emerging. It will also promote existing technologies that use electricity and support their implementation in companies.

In cases where electrification is not an immediate option, this type of planning will allow businesses to seize electrification opportunities as they arise and as their investment cycles permit. For instance, replacing heavy equipment when it has reached the end of its useful life, as well as implementing projects to expand production, are key moments to modernize and improve equipment, particularly through electrification.

The government will assess further possible interventions to keep electricity prices competitive compared to other forms of energy.

Coupled with measures to use Québec's clean energy as efficiently as possible and limit the impact on peak demand, electrifying more industrial processes will allow the sector to move closer to a sustainable reduction in greenhouse gas emissions.

Use of alternative energies

The industrial sector requires a multi-pronged approach to energy solutions.

Bioenergies, and potentially green hydrogen, could also replace fossil fuels in areas where electricity is not a feasible or economically viable option.

Where fossil fuels are necessary, they will need to be used more efficiently, with a focus on the least polluting forms.

Coal, which is still used in Québec's industrial sector, is one of the most greenhouse-gas-emitting sources of energy. The Québec government aims to eliminate the use of coal as an energy source by 2030, unless the greenhouse gases it emits can be sequestered using proven technologies.

The government will support efforts to develop carbon capture and storage technologies that are suitable for each industry. In addition, it will support companies as they convert their manufacturing processes to reduce emissions. Both interventions will avoid compromising businesses' viability.

3.

BUILDINGS

With the **2030 Plan for a Green Economy**, the government is taking a new, coordinated approach to decarbonizing building heating. It will be aiming to reduce the use of fossil fuels while prioritizing renewable energies, primarily electricity, where it is technically feasible and economically justified to do so.

The government is breaking new ground by bringing together Québec's two main energy distributors with the common goal **of reducing greenhouse gas emissions from building heating by 50% by 2030.**

Through this approach, the complementary nature of Québec's electricity and natural gas systems will be a vector for success that will maximize economic benefits while minimizing costs for customers. The government will also focus on the greening of natural gas.

It will take strong action to make buildings more energy efficient and reduce their carbon footprint—action that the government is ready to take.

Highlights

- 10.3% of Québec's total emissions in 2017 (3rd most emitting sector)
  - 59.5% from the commercial and institutional building sectors (fossil fuels are the main sources of energy)
  - 40.5% from the residential building sector (electricity is the main energy source used; in 2017, more than 80% of households were heated by electricity[11])
- 27.6% decrease in greenhouse gas emissions from 1990 to 2017
  - 52.9% decrease in the residential bulding sector
    - Oil-powered equipment converted to electricity
  - 13.9% increase in the institutional and commercial bulding sectors
    - Significant increase in building size and natural gas consumption

11. Source: Hydro-Québec.

3.1 Decarbonizing building heating

3.1.1 Optimizing the use of electricity and natural gas

The government aims to electrify a greater share of the heating that is currently provided by natural gas. This will reduce greenhouse gas emissions while improving Québec's trade balance.

The partial conversion from natural gas to electricity will be part of a comprehensive, balanced approach that is based on the complementarity of the electrical and gas grids.

Fully electrifying heating would not be ideal for Québec. It would create a significant peak demand issue at certain times during the winter, when electricity consumption is greatest. It would also increase costs for all customers.

Furthermore, it is worth noting that electricity cannot be the only option for all commercial and institutional buildings because of certain constraints. For example, in the event of a widespread or major power outage, hospitals must be able to rely on an alternative energy source. In some areas, the electrical grid also struggles to handle increased demand.

As a result, the conversion effort will primarily aim to maximize the electrification potential of heating in Québec while minimizing costs for customers.

To that end, it will be important to determine how potential initiatives will financially affect the customers concerned, as well as how they will affect Québec's major energy networks.

Striking a balance

The following factors will need to be considered in order to strike a balance:

- The increase in Hydro-Québec's power demand, especially during the winter peak, and the associated costs;
- The additional costs incurred by customers who have converted their equipment (for example, by purchasing electric heaters or changing their electrical systems) or are receiving higher energy bills, especially when it comes to commercial and institutional customers;
- The impact on natural gas tariffs for other customers, particularly industrial customers;
- The ways in which various energy efficiency and peak demand management measures complement each other;
- The need to maintain alternative energy solutions in the event of a power outage so that front-line services can remain operational and communities can become more resilient to extreme weather events.

3.1.2 Increasing the use of renewable natural gas and other renewable energies

Greenhouse gas emissions from building heating will be reduced as more renewable natural gas is gradually introduced into Québec's natural gas network. Eventually, the injection of green hydrogen into the gas grid could also help green the natural gas system.

For buildings, the energy transition will also involve greater use of other renewable energy sources, such as biomass or geothermal energy, where appropriate in order to manage peak demand and further reduce buildings' greenhouse gas emissions.

3.1.3 Replacing fuel oil with electricity

The government intends to eliminate fuel oil in favour of electricity. Fuel oil is the most carbon-intensive energy used in building. Furthermore, it contains air pollutants that affect air quality. **By 2030, the use of fuel oil for heating buildings will be phased out and replaced, primarily by electricity and other renewable energies**.

3.2 Increasing energy efficiency efforts and improving peak load management

The government will step up energy efficiency efforts in all buildings and for all energy sources used.

For buildings powered by electricity, this improved management will free up energy and create more room for further electrification or use for other purposes.

For buildings powered by fossil fuels, energy efficiency measures will directly reduce greenhouse gas emissions.

In all cases, better energy management will result in savings on consumers' energy bills.

Efforts will focus on making heaters and buildings more efficient and on construction standards for new and existing buildings.

New technologies and changes in consumption patterns will also lead to better energy use. These include enabling technologies such as efficient heat pumps, energy storage (batteries), and thermal waste energy recovery.

At the same time, changes in habits that reduce electricity consumption during peak periods will be encouraged, particularly through the promotion of tariffs that reward that behaviour.

To stimulate a major, collective energy efficiency effort throughout Québec, the government will turn to innovative forms of financing where public funds will act as a lever to catalyze private investment.

Hilo, Hydro-Québec's newest subsidiary

Hilo, Hydro-Québec's newest subsidiary, launched its smart home service in 2020. This turnkey service allows customers to optimize their energy consumption, control their smart devices through a single app, and save money on their bills. Hilo customers also receive cash rewards for participating in Hilo challenges (during peak demand periods), discounts on connected appliances, and free installation when they sign up with Hilo.

Hilo's services will also extend to businesses to help them reduce their energy costs and greenhouse gas emissions. Other products and services will be added over time, targeting areas such as electric mobility, smart storage, and self-generation of solar power.

Through its high-tech energy efficiency measures, Hilo will help to free up power during peak demand periods.

3.3 Materials with a lower carbon footprint

Beyond the greenhouse gas emissions related to heating, buildings can also affect greenhouse gas emissions through the materials used to build them, especially when those materials' lifespans are taken into account.

The government will encourage the use of materials with a lower carbon footprint, such as wood or other bio-based materials.

Wood, in particular, is a renewable and recyclable material that requires little fossil fuel to manufacture and use. As such, it is known to reduce greenhouse gas emissions when it is used as a replacement for other materials with a higher carbon footprint.

Wood is already widely used to build single-family homes, but it is becoming increasingly common in multi-family buildings of four storeys or less as well. This process could be expanded to taller multi-family buildings and non-residential construction. Increasing the use of wood in more advanced building functions, like insulation or finishing, will also be considered.

3.4
Government as a role model

More than 75% of greenhouse gas emissions from Québec government activities come from the demand for fossil fuels in public buildings.

The government has committed to reducing greenhouse gas emissions from its buildings to 60% below 1990 levels by 2030.

As such, the government will be taking concrete actions for new and existing buildings. For instance, it will ensure that renewable energies, including electricity, are prioritized when constructing or renovating buildings. The intent will be to make sure that renewable energies become the primary source of energy used for heating. For new buildings, the use of materials with a low carbon footprint, such as wood, will also be encouraged.

4.

AGRICULTURAL PRODUCTION, WASTE MANAGEMENT, AND NATURAL ENVIRONMENT

The **2030 Plan for a Green Economy** includes three other sectors in its climate change mitigation efforts:

- A tailored approach will be used for the agricultural sector, based on supporting agricultural buisinesses and developing local consumption;
- Efforts will be made to reduce and better manage waste;
- Natural environments, such as forests, will be valued for their carbon sequestration abilities.

Highlights

Agricultural sector

- 9.8% of Québec's total greenhouse gas emissions in 2017 (4th most emitting sector)
  - Emissions come from non-energy sources, primarily ruminant digestion, manure management, and agricultural soil management[12]
- 11% increase in greenhouse gas emissions from 1990 to 2017; however, they have been stable over the last ten years or so
  - Increased emissions from manure management (more animals)
  - Increased emissions from agricultural soil management (greater use of nitrogen fertilizers on crops)
  - Decreased emissions from enteric fermentation

12. Greenhouse gas emissions from the agricultural sector's energy use are counted as transportation (for fuel) and industrial combustion (for building heating) emissions for the purposes of the *Inventaire québécois des émissions de gaz à effet de serre*.

Waste

- 5.8% of Québec's total emissions in 2017 (5th most emitting sector)
  - Come from organic waste (60% of waste eliminated)
- 33.9% decrease in greenhouse gas emissions from 1990 to 2017
  - Marked increase in landfill gas collection and combustion

Natural environments

- Carbon pools – sequestration potential

4.1 Tailoring the approach to the agricultural sector

Emissions from the agricultural sector are closely linked to the biology of plants, soils, and animals and the ways they interact with the climate. As a result, reducing those emissions poses a unique challenge.

That said, the introduction and widespread adoption of best practices and new technologies will make it possible to reduce greenhouse gas emissions in agriculture by 2030. Innovation will be critical in developing additional solutions to reduce the sector's greenhouse gas emissions.

Supporting farm businesses

With the **2030 Plan for a Green Economy**, the government wants to support farm businesses and help them adopt practices and technologies that will reduce their greenhouse gas emissions. In so doing, farmers will be contributing to the development of sustainable agriculture in Québec.

One support approach will involve increasing training for agricultural advisors and farmers while enhancing knowledge transfer at the regional level and improving advisory services for the sector.

Interventions will focus on furthering practices to optimize nitrogen fertilization practices in order to reduce their greenhouse gas emissions. Further efforts will also be made to maintain and improve soil carbon and the agroecosystem's resilience in the face of climate change. Finally, practices and technologies to reduce methane emissions from livestock will be expanded. This will involve actions like changing ruminant feed based on knowledge transfer and research.

A tailored approach

Québec's agricultural sector is made up of a large number of businesses of varying sizes, spread over a vast area. The government will prioritize a tailored approach to reducing greenhouse gas emissions from agricultural activities that takes this diversity into account.

Seizing the opportunity

Reducing greenhouse gas emissions in agricultural production is an opportunity for the sector. It is a chance for farmers to offer food products with a lower carbon footprint on local and export markets. This is ideal since citizens are increasingly concerned about the environmental impact of their lifestyles and diets.

Developing local consumption

The government understands that agriculture and food supply networks are critical. As such, it will encourage businesses to supply products with lower carbon footprints, more specifically by helping the agricultural sector promote those products to Québec consumers.

Supporting these activities is also critical for the vitality of rural areas. The government intends to strengthen local purchasing, agritourism, and short food supply chains to stimulate investment within communities. The agricultural sector will be a central partner in this promotion of local products.

4.2 Reducing waste and improving waste management

In terms of reducing and managing waste, the government intends to act first and foremost on the organic matter that generates greenhouse gas emissions in this sector.

The government will promote the reduction of waste at the source and the recovery of organic matter, in particular by capturing and destroying or recovering biogas from landfills.

The government will also implement measures to address halocarbons in air conditioning and refrigeration equipment, as these gases have a high global warming potential.

Reducing and valuing organic matter

With the **2030 Plan for a Green Economy**, the government is focusing on reducing organic matter from food loss and waste at the source, particularly those coming from actors in the food chain such as producers, processors, retailers, and consumers. This will result in significant environmental and economic benefits.

Organic matter that cannot be reduced at the source will instead be recovered as much as possible.

The government has established a valuation strategy for organic matter[13] with the aim of diverting residual organic matter from disposal and instead recovering it as an input into the economy. Biomethanization[14] and composting initiatives will be encouraged.

Valuing organic matter: an example of a circular economy

Recycling and reintroducing organic matter into production cycles as a way of supporting a circular economy will contribute significantly to environmental efforts and the development of a green economy.

For example, the recycling of food and green waste is advocated in Québec because, once processed, they are an important component of the soil and contribute to soil conservation, the maintenance of soil fertility, and the productivity of agricultural crops. They also reduce the use of mineral fertilizers.

Capturing and recovering biogases

The government will promote the capture and destruction or recovery of biogases from landfills.

In fact, improving the recovery of biogases from landfills is the preferred approach for reducing greenhouse gas emissions from the waste sector. Biogases from landfills can be used as a substitute for fossil fuels, reducing greenhouse gas emissions in the industrial, transport, and building sectors.

The biogases produced by landfills, like those from biomethanization sites, can also be refined into renewable natural gas and injected into gas networks as a substitute for traditional natural gas.

13. Ministère de l'Environnement et de la Lutte contre les changements climatiques. *Stratégie de valorisation de la matière organique*. July 2020.

14. Biomethanization is a natural biological process in which organic matter is decomposed by microorganisms (bacteria) through anaerobic digestion (i.e. digestion without oxygen).

Halocarbons

The government will take action regarding halocarbons, which are gases with a high global warming potential. They are used as synthetic refrigerants in most refrigeration and air conditioning equipment.

Of the halocarbons, hydrofluorocarbons have several thousand times more global warming potential than CO_2. It is therefore important to limit the use of these substances and increase their recovery. **One of the government's goals is to recover 100% of refrigerant gases from air conditioners and refrigerators by 2030.**

Extended producer responsibility

As of 2019, household and air conditioning appliances are covered by extended producer responsibility.

Extended producer responsibility is an approach that makes producers responsible for managing the waste from the use of their products.

Companies subject to this responsibility in Québec are required to implement recovery and reclamation programs that cover processes like the optimal recovery and handling of appliances that have reached the end of their lifespans. This includes the removal and proper management of halocarbons or equivalent substances in the appliances. Companies will also have to meet recovery targets as early as 2024.

Banning certain halocarbons in the refrigeration sector

Starting in 2021, halocarbon regulations will aim to phase out hydrofluorocarbons with high global warming potential in new industrial, commercial, and institutional refrigeration equipment. These regulations will target fields where alternatives already exist and can be implemented quickly.

4.3 Natural environments, including the forest

Natural environments store carbon in the short, medium, and long term. In doing so, they limit the amount of greenhouse gases in the atmosphere, contributing to the fight against climate change.

In some cases, natural environments can even absorb more carbon than they emit. These areas are known as "carbon sinks."

Humans have little direct, short-term influence on the carbon sequestration capacities of the oceans and large wilderness areas. However, we can affect the carbon sequestration capabilities of wetlands and forests.

The conservation of natural environments (particularly wetlands) through measures like the network of protected areas and the environmental legal framework helps maintain carbon storage and biodiversity across Québec.

The contributions of natural environments, including forests, that can store carbon will be highlighted and the projects that provide the greatest benefits for Québec's communities will be prioritized.

A very high proportion of Québec's forests are public, meaning that the government is responsible for managing them. The government employs the highest sustainable management standards, including ecosystem-based management, for the care of these forests. Through its actions, the government must support forests' contribution to climate benefits in the short, medium, and long term while helping them adapt to the effects of climate change.

Wetlands

Once carbon stocks in wetlands have been destroyed, it is difficult to restore them in the short term. We therefore need to focus on protection, prioritizing wetlands that store a large amount of carbon.

Commercial forests

The carbon pool in commercial forests can be extended through silvicultural interventions. This will complement initiatives to protect certain forest areas for biodiversity reasons or to maintain ecosystem health and resilience.

Calculating the climate benefits of forest interventions is complex, and we may not see benefits for several decades.

Given the size of the area to be covered, the diversity of the ecosystems involved, and the complexity of interactions in natural environments, the government will be investing in research to better understand how natural environments can play a concrete role in combating climate change. That research will allow it to make better decisions regarding forests' contributions to the fight against climate change.

One measure will involve identifying the most important carbon pools in Québec and determining their vulnerability. Innovative silvicultural practices will also be tested, with the aim of identifying and implementing those with the greatest potential to effectively maintain or increase carbon stocks. These practices will not only target trees and wood products; they will also target forest soils, which themselves are huge carbon pools.

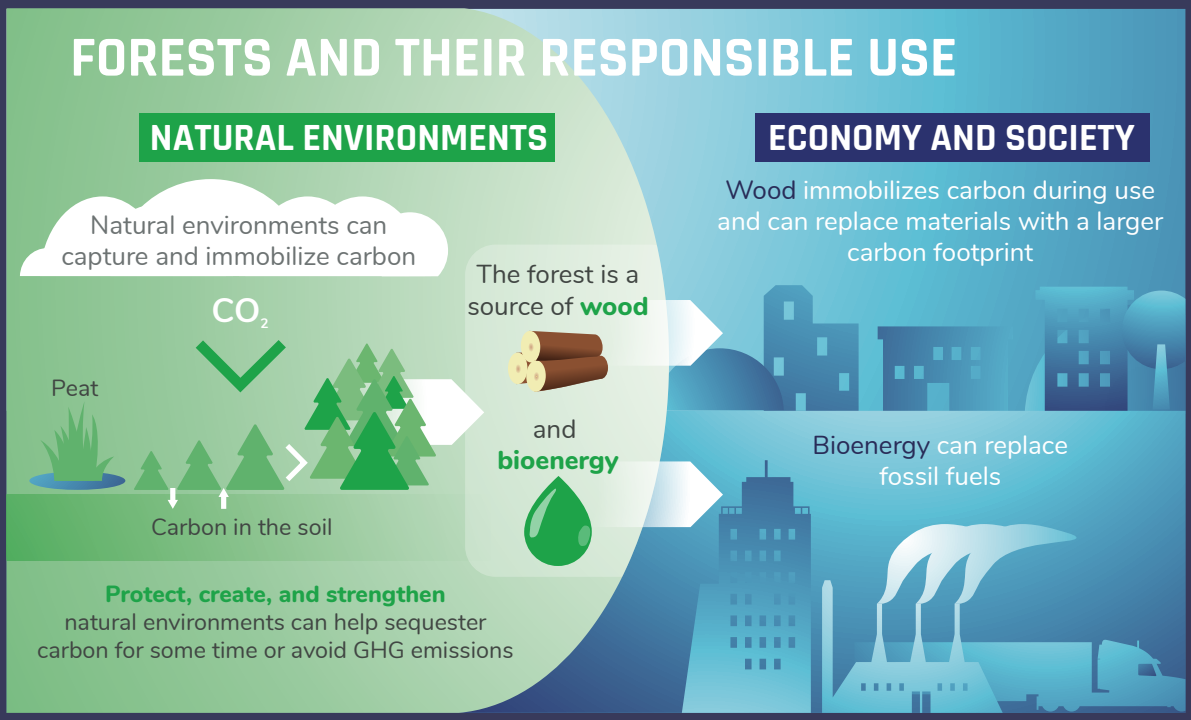
In order to create short-term benefits, the chosen practices will need to create the greatest reductions possible as quickly as possible with a minimum of risk. Socio-economic assessments will make it possible to prioritize projects that have the greatest impact on Québec communities.

Forests and their sustainable management: powerful allies in the fight against climate change

Forests do far more than just sequester carbon. They also provide society with energy and materials that have a low carbon footprint, which in turn can help other sectors (like industry, buildings, and transport) reduce their greenhouse gas emissions. For example, bioenergies from logging residues can replace fossil fuels.

Wood products are important because they continue to store some of the tree's carbon after they are cut, and they can also replace building materials responsible for many more greenhouse gases.

A balance therefore needs to be struck between the benefits of keeping trees in forests and those of transforming the trees into products and energy.



5.

PRODUCING ELECTRICITY AND ACCESSING THIS CLEAN ENERGY

Some 99% of Québec's electricity already comes from renewable sources. Even so, the **2030 Plan for a Green Economy** will aim to further increase the supply of renewable energies, particularly in areas that are not on Hydro-Québec's grid.

In areas that are on the grid, efforts will be made to ensure that it can meet demand. In particular, access to the three-phase grid will be expanded to meet the needs of rural communities and the agricultural sector.

Highlights

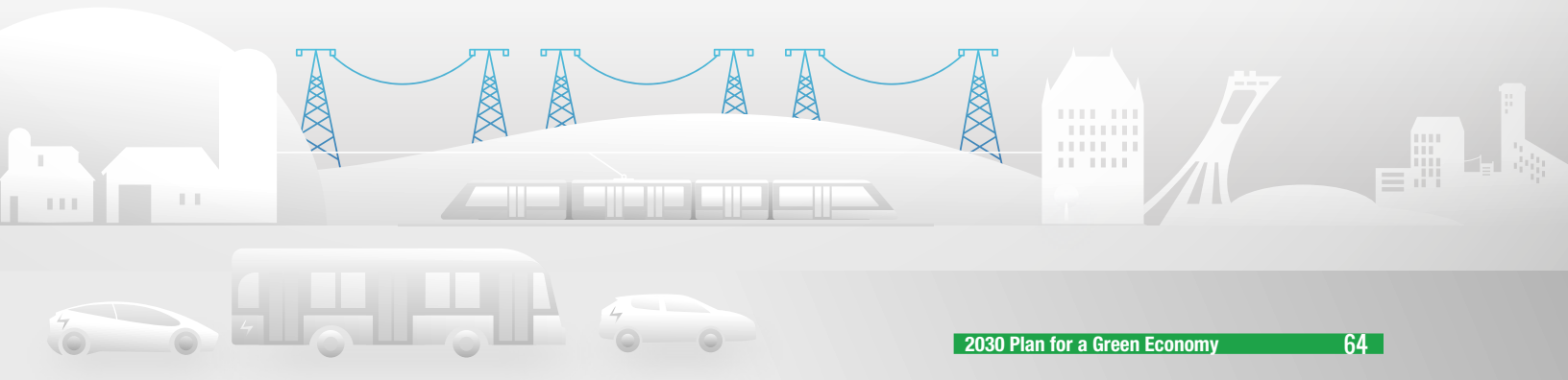
- 0.3% of greenhouse gas emissions (lowest emitting sector in Québec)
  - 22 off-grid systems that have to produce their own energy, most often using diesel generators
- 83.8% decrease in greenhouse gas emissions from 1990 to 2017
  - Decrease mainly due to the 2011 closure of the Tracy Thermal Generating Station, which ran on heavy fuel oil

Supplying off-grid networks with renewable energy

Currently, 99% of Quebecers are on the Hydro-Québec grid.

However, a certain number of customers live in remote areas and are therefore not on the grid.

These customers are served by 22 off-grid systems, which must produce their own power. Most of those systems use diesel generators, which emit greenhouse gases. This situation is responsible for most of the greenhouse gas emissions from electricity generation in Québec. That said, while electricity generation does emit greenhouse gases, the sector only accounted for 0.3% of Québec's total emissions in 2017.



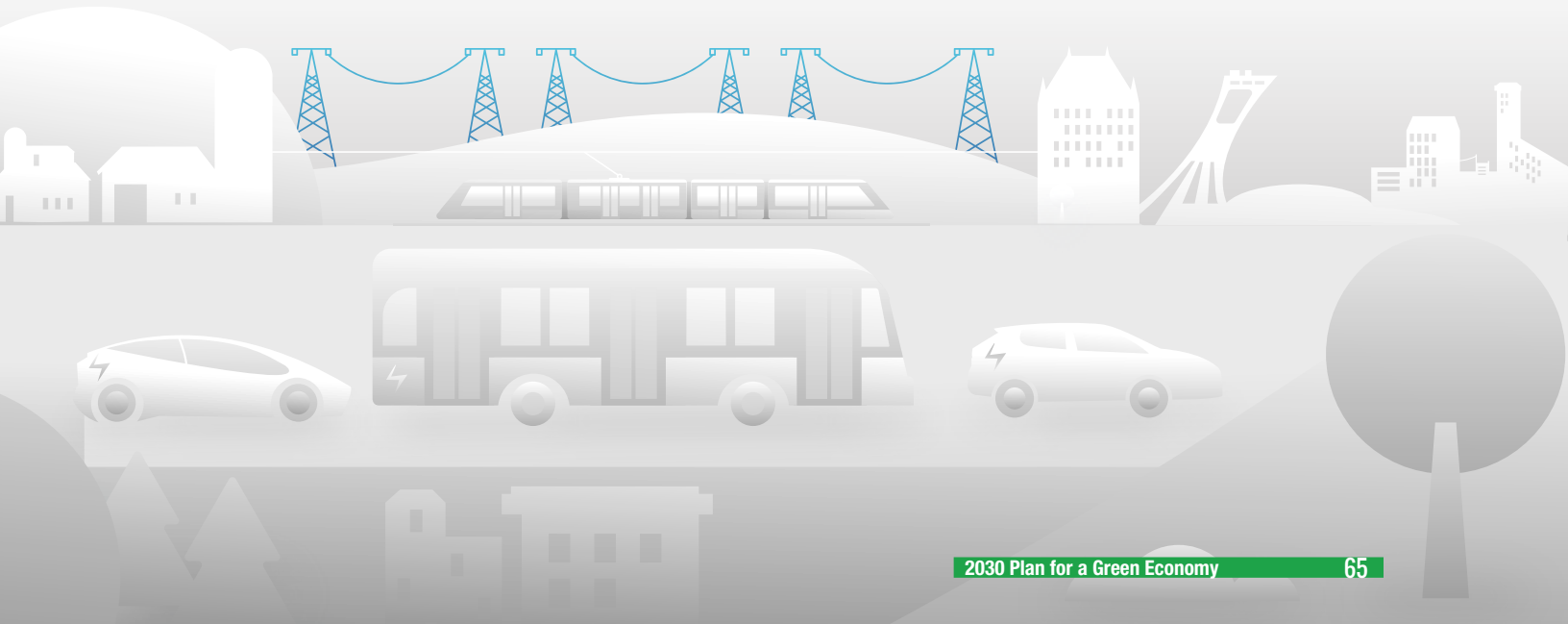
Numerous projects based on the four main criteria adopted by Hydro-Québec—namely reliability of power supply, support from the community, reduction of emissions, and lowering of generation costs—are planned or underway to replace part or all of the output from thermal power plants on off-grid systems. These projects will directly lower greenhouse gas emissions. They will also benefit the communities they serve, particularly by boosting economic development, ensuring supply security, reducing noise, and improving air quality.

According to Hydro-Québec's Strategic Plan 2020–2024, the aim is to **achieve a 70% renewable energy supply in off-grid systems by 2025.**

Strengthening the grid, in particular through better access to the three-phase grid

Even in on-grid regions, efforts are still needed to make sure that the grid can meet demand, which in turn will help increase the proportion of renewable energies in the energy balance. In some sectors and areas, the distribution and transmission infrastructure may not be sufficient to meet demand as electrification increases.

Steps will be taken to reflect the differing realities experienced by Québec's communities and businesses, accounting for regional needs and priorities. This will involve extending the three-phase grid to certain rural areas, consolidating the electrical grid in oversaturated sectors, expanding the grid to reach certain unconnected industrial and agricultural customers, and reinforcing the grid so that it can accommodate new sources of power.



PART TWO:

BUILDING THE ECONOMY OF TOMORROW

The economy of tomorrow will be greener, more prosperous, and more resilient.

Québec's resources, particularly its clean and renewable electricity, will have a prominent place in that economy. Québec will position itself to become a leader in the production of clean energy, including green hydrogen and bioenergies.

The economy of tomorrow will also be driven by the emergence of new companies and strategic sectors, particularly in the field of electric vehicles and batteries, as well as by the innovation that will fuel new technologies and know-how.

The **2030 Plan for a Green Economy** will contribute to the development of the circular economy, which, by encouraging networking and synergy between businesses in the same region, will increase efficiency and promote the development of products with a low carbon footprint as well as local benefits. Developing Québec sustainably also means focusing on buying local and short supply chains. This is essential to our long-term prosperity and resilience.

Significant economic benefits

Between now and 2030, this ambitious electrification and climate change project will have a significant, concrete, and positive impact on Québec's GDP. It will also create thousands of new jobs. What's more, the **2030 Plan for a Green Economy** will also help meet the government's private and foreign investment targets.

Additional investments

The government's desire to use this ambitious project as a lever for the economy of tomorrow will, of course, be demonstrated through the measures in the **2030 Plan for a Green Economy**'s implementation plans. In addition to these measures, it will also be demonstrated, more broadly, through various other economic interventions, particularly through Investissement Québec, as well as other stakeholders such as Hydro-Québec.

1.

TAKING ADVANTAGE OF OUR CLEAN ELECTRICITY

The government is aiming to use our considerable hydroelectric resources to make Québec the battery of northeastern America.

This involves the ability to use electricity exports to contribute to the fight against climate change beyond Québec's borders and the potential to attract even more companies that want to take advantage of this clean, competitive energy.

1.1 Electricity exports

Québec sells clean, reliable electricity at competitive prices through approximately 15 connections to the Ontario, New Brunswick, New York, and New England markets.

Between 2015 and 2019, Hydro-Québec's annual exports averaged 33.2 TWh, representing an average revenue of $772 million.

According to Hydro-Québec's estimates, these exports reduced the greenhouse gas emissions of Québec's partners by an average of nearly 8 million tons of CO_2 equivalent annually between 2015 and 2018.

Outlook

Our Canadian and American partners' growing need for clean electricity is also an opportunity for Québec to contribute to their fight against climate change by increasing electricity exports.

Electricity from Québec has two main advantages for other markets: it allows them to reduce their greenhouse gas emissions while profiting from energy at a stable, competitive price.

Given the current climate crisis, Québec is well positioned to reinforce its status as North America's leading supplier of clean energy. Major export projects are already under development and many more may emerge in the coming decade.

By 2030, the government has set its sights on increasing electricity exports to neighbouring markets under long-term contracts. It will propose energy alliances to neighbouring provinces and states in the American Northeast in order to promote Québec's resources and increase electricity exports. These energy alliances will make the American Northeast a greener, more competitive region.

1.2
Electricity as a factor in attracting businesses

For several decades, electricity has been a powerful factor in the industrialization of Québec's economy, attracting investments that have profoundly transformed and enriched numerous regions.

Through the **2030 Plan for a Green Economy**, the government will continue its progress, using the availability of clean electricity to attract companies looking to benefit from green, reliable energy at a predictable cost to lower their greenhouse gas emissions.

Those businesses will then be able to produce goods or provide services in Québec while emitting fewer greenhouse gases than they would if they were operating elsewhere. Furthermore, by moving to Québec, not only will they help reduce global greenhouse gas emissions, but they will also create wealth and well-paying jobs for the people of Québec.

Efforts taken at the international level to attract investment to Québec will allow to build on this advantage.

2.

BECOMING A LEADER IN THE PRODUCTION OF GREEN HYDROGEN AND BIOENERGIES

In Québec, energy use is responsible for nearly 70% of greenhouse gas emissions—almost exclusively from fossil fuels. Therefore, Québec's energy system must undergo a major transition in order to reduce greenhouse gas emissions.

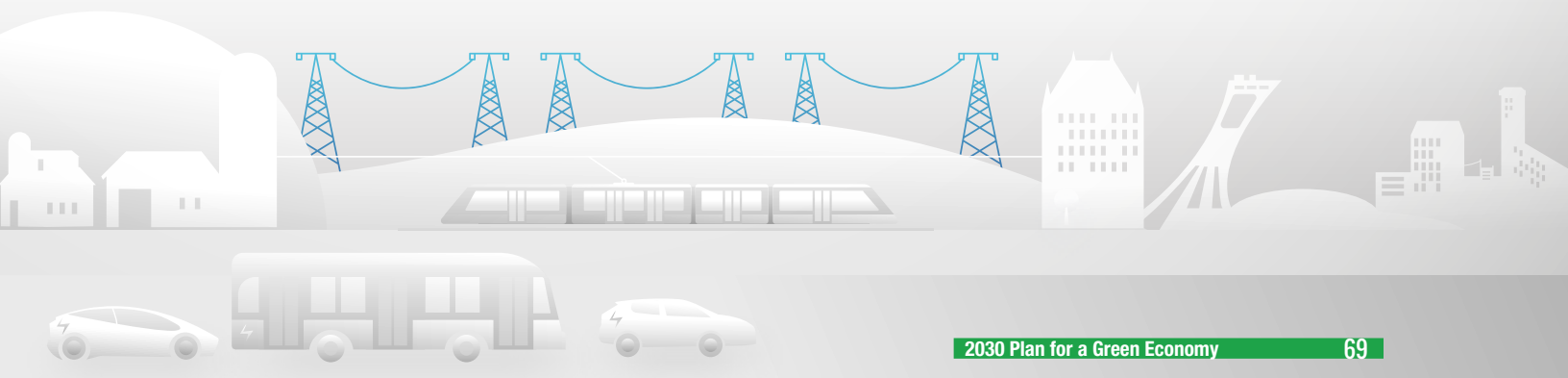
Québec is already known for its clean electricity from renewable sources. However, given the specific yet diverse energy needs of many sectors, electrification is not always the best option. Other clean solutions will be necessary to meet those energy needs.

As such, Québec intends to position itself as a leader in the production of green hydrogen and bioenergies, which are clean energy sources that can be used as a complement to electricity. In the coming decades, green hydrogen and bioenergies will play an important role in decarbonizing the most emitting sectors while serving as levers for developing a green and sustainable economy.

With that in mind, the government will be releasing and implementing Québec's first green hydrogen and bioenergy strategy as the first milestone on the journey towards developing the energies of the future. That strategy will provide a comprehensive, coherent, and integrated vision that covers both their production and their use in Québec, as a replacement for imported fossil fuels.

2.1 Green hydrogen

Hydrogen is currently drawing significant interest around the world. It has even become a key factor in the energy transitions of several countries. Investments in the sector have also grown significantly, leading to major advances in both technology and products.



Currently, the majority of global hydrogen production comes from fossil fuels. This is known as grey hydrogen. However, Québec has all the assets it needs to become a world leader in the production and use of green hydrogen thanks to its large capacity for producing renewable energy. In order to be competitive, green hydrogen will require sustained demand and large-scale production.

Québec must seize this opportunity to develop the necessary expertise and integrate this new form of energy into its energy system and therefore improve its competitive position in the international industry of green hydrogen production.

What's more, green hydrogen will serve as a solution to indirectly electrify the economy when direct electrification is not an option.

Hydrogen: grey, blue, and green

Hydrogen is typically classified into one of three categories—grey, blue, or green—based on the way it is produced.

Grey hydrogen is currently the most common; it is produced using fossil fuels and generally involves a process known as "steam reforming" of natural gas.

Blue hydrogen is produced the same way as grey hydrogen, but the process is coupled with carbon capture and storage technology.

Green hydrogen, on the other hand, is produced by the electrolysis of water using electricity from renewable sources. As a result, it does not emit any greenhouse gases when it is produced.

Developing green hydrogen production will not only allow Québec to reduce its consumption of imported fossil fuels (and therefore its greenhouse gas emissions), but also increase the resilience of its energy systems while creating jobs in all regions.

Most promising applications

Green hydrogen has a number of promising potential applications in Québec:

- **Industrial processes** – Green hydrogen can be used as a renewable raw material to replace hydrogen from fossil fuels in conventional industrial processes (such as steel production, oil refining, and ammonia production).
- **Heavy and intensive transport** – Green hydrogen can be used as an energy carrier that can be converted back into electricity in fuel-cell-powered electric vehicles.
- **Green chemistry** – Green hydrogen can be used as a renewable raw material in the production of green and innovative chemicals and help make bioenergy production more efficient. Hydrogen can also be combined with carbon from biomass or CO_2 from industrial emissions to produce synthetic fuels for the trucking and aviation sectors.

- **Massive energy storage** – Green hydrogen also has potential when it comes to storing large amounts of energy. That stored energy could be used to power off-grid systems—reducing their greenhouse gas emissions—or to cover winter peak periods.

- **Heat production** – Green hydrogen could be injected directly into the natural gas grid, allowing it to be distributed to consumers through existing infrastructure. It can also be combined with captured CO_2 to produce renewable natural gas (CH_4) that can replace fossil-based natural gas.

To accelerate the deployment of green hydrogen technologies, Québec will support the implementation of technology showcases for the most promising applications.

Given that this is an emerging sector, the benefits from investments and efforts before 2030 could lead to even more reductions in the longer term. Québec's first green hydrogen and bioenergy strategy will allow the government to better envision the benefits of those technologies and their integration into our economy.

Making our mark

Developing the green hydrogen industry will require significant investments from the private sector. The government will need to reassure investors by creating a stable and predictable economic environment.

Québec will be able to ground this development in the expertise and resources at its disposal, such as Hydro-Québec, the industrial sector, and the academic community (which is already very active in this area). The course has been charted. We just need to give ourselves the drive to make our mark.

Solid expertise in Québec

Québec already boasts solid expertise in hydrogen. For example, the Hydrogen Research Institute at the Université du Québec à Trois-Rivières conducts fundamental and applied research on numerous applications like hydrogen production, storage, and valuing in several sectors, including transport. Several other universities are also involved in the technological development and promotion of hydrogen, including Polytechnique Montréal, Université de Sherbrooke, Institut national de la recherche scientifique (INRS) and McGill University.

There are also research centres with a great deal of expertise, such as the Institut de recherche d'Hydro-Québec and the Center of Excellence in Transportation Electrification and Energy Storage.

2.2
Bioenergies

The bioenergy sector has already reached certain major milestones, which is allowing Québec to drive itself even further. Some of these milestones include the introduction of support measures for bioenergy innovation and use, as well as the development of a regulatory framework that requires fossil fuels to be replaced with various forms of bioenergy.

Other measures are helping projects move forward for the development of bioenergies, such as residual forest biomass and the biomethanization of organic waste. Support is also being given for the production of renewable natural gas and biofuels.

It is becoming necessary to unite the driving forces in this vast field in order to innovate and build a modern, vibrant business environment that is founded on a suitable regulatory framework.

Like green hydrogen, the production and consumption of bioenergies will play a complementary role to electricity in reducing Québec's carbon footprint. Not only will the development and rise of bioenergies help us achieve environmental targets, but it will also help diversify and secure energy supplies, improve Québec's economic balance, and generate significant social and economic benefits in regions as part of a circular economy.

Bioenergies will be the cornerstone of a strong and sustainable bioeconomy for all regions of Québec. As such, **the government is maintaining the target of increasing bioenergy production by 50% by 2030[15].**

Mature and developing sectors

Bioenergies are made of waste materials from forestry, agriculture, and urban sources. They can be used to create fuels for transport, as well as heat and electricity.

Multiple sectors related to bioenergies (such as heating and cogeneration with residual forest biomass, renewable natural gas from urban biomass, and first-generation biofuels) are already technically and economically mature.

Other sectors, such as advanced biofuels, still face technical and economic hurdles but remain promising and must be supported.

Investment choices in each sector will aim to optimize gains for the climate transition. Additionally, bioenergies will be deployed according to the principles of sustainable development. Doing so will avoid compromising air quality or other environmental objectives, particularly those in forestry and sustainable agriculture.

15. Target of the 2030 Energy Policy. Target calculated with 2013 as a reference year.

Structuring value chains

The government will support the availability of bioenergies in Québec and will measure progress in terms of changes in their consumption and production and their contributions to the fight against climate change.

In order to promote bioenergy production, it is particularly important to support market players with the intent of structuring value chains and making them more reliable, all while attracting companies that are looking to seize new business opportunities in a circular economy.

It is also essential to create a strong business environment in order to promote the creation of a critical mass of projects in the short term. This will stabilize investor confidence and allow for the competitive deployment of new sectors. To that end, **the government plans to raise the minimum volume of renewable natural gas injected into the natural gas grid to 10% by 2030.**

The new strategy will stimulate the emergence of promising sectors while taking into account the transition that it will imply for individual sectors. In addition, the government will act swiftly on certain barriers (whether they be technical, economic, or other) so that the production and consumption of bioenergies can be maximized. Finally, to promote the use of bioenergies, the Government of Québec will set an example by considering the carbon footprint of the energy it consumes.

3.

GENERATING WEALTH THROUGH STRATEGIC SECTORS

The economic vision in the **2030 Plan for a Green Economy** involves supporting the emergence and development of many sectors and businesses involved in electrification and the fight against climate change.

More specifically, support will be granted in areas such as transport electrification, carbon utilization and sequestration, low-carbon-footprint materials like wood, smart and green buildings, carbon management, and the construction of green and resilient infrastructure.

3.1 The great electrification endeavour

The government's major transport electrification endeavour, launched with the **2030 Plan for a Green Economy**, is an exceptional opportunity for growth and development for all the industries that will be associated with it.

Québec has many resources and extensive expertise in the electrification of vehicles such as streetcars and light rail vehicles, heavy trucks, city and school buses, recreational vehicles, and specialized vehicles. The same is true of associated sectors such as charging stations and technologies, batteries, energy storage, artificial intelligence, and strategic minerals.

Québec's economy has the required assets to meet the needs of its own market and play a central role in the manufacture of electric vehicles and their components in North America.

The government's efforts to take full economic advantage of transport electrification will involve electrifying multiple types of vehicles and seizing the resulting opportunities for technological development.

Developing public transit networks

With the **2030 Plan for a Green Economy**, considerable investments will be made in the development of public transit networks with a significant electric component. This will lead to substantial economic benefits, both direct and indirect.

The government will use the tools at its disposal to make sure that Québec industry will profit from the economic benefits of these core projects as much as possible in compliance with Québec's trade commitments at the Canadian and international level.

In particular, these projects will support the development of Québec's railway industry.

The railway sector in Québec

Two major multinationals form the cornerstones of Québec's railway sector: Bombardier Transportation and Alstom.

Thanks to these two major players, Québec can count on internationally renowned expertise; a network of dynamic suppliers; and state-of-the-art facilities, including plants in La Pocatière and Sorel-Tracy and a design and development centre in Saint-Bruno-de-Montarville. Bombardier Transportation manufactures light rail, subway, and tramway cars—all electric—at its La Pocatière plant.

Alstom has announced its intention to expand its activities in Québec, including its research and development for North American products.

Electrifying vehicles

The government's efforts to take full economic advantage of transport electrification will also involve electrifying multiple types of vehicles and seizing the resulting opportunities for technological development.

A variety of vehicles made in Québec

Manufacturing Québec-made electric vehicles relies on a multitude of Québec-based suppliers that can supply manufacturers with parts and components.

The electric vehicles manufactured in Québec include specialized vehicles and heavy trucks for transporting goods.

Some companies also convert vehicles, both light and heavy, by integrating electric drive systems into vehicles that do not currently come with them.

Engaging projects in partnership with Québec manufacturers

Through the *Développement mobilisateur de véhicules lourds innovants 100% électriques* (VLIÉ) project, which is financially supported by the Government of Québec, Lion Electric and its partners AddÉnergie, Centum Adetel, and Dana-TM4 have developed a variety of electric vehicles. These include buses and freight trucks.

To take this development even further, the Government of Québec is supporting the *Projet mobilisateur en électrification des transports*, which aims to integrate technologies and equipment into specialized heavy electric vehicles.

Based on Lion Electric's electric truck platform, this project aims to develop marketable models of electric bucket trucks, utility trucks, refrigerated vans, waste collection trucks, and ambulances by 2021–2022.

The project brings together the work of seven Québec companies from different regions: Lion Electric (Laurentides), Fourgons Transit (Laval), Ambulance Demers (Montérégie), Maxi-Métal (Chaudière-Appalaches), Posi-Plus Technologies (Centre-du-Québec), Boivin Évolution (Chaudière-Appalaches), and Systèmes Pran (Capitale-Nationale).

Québec is also an innovator in the manufacture of electric buses (both city and school), and the prospects for development in that industry are promising.

Moreover, some of the Québec's companies in this niche supply vehicles not only in Québec, but to foreign markets as well.

Electric buses made in Québec

Nova Bus has been manufacturing city buses at its Québec plants in Saint-François-du-Lac and Saint-Eustache for 40 years. Its products include a standard 100% electric bus, a standard hybrid bus, and an articulated hybrid bus.

Saint-Jérôme-based Lion Electric is a manufacturer of school buses and minibuses. In business since 2015, it has been offering an all-electric version of its full-length school bus since 2016 and a school minibus since 2018.

Micro Bird of Drummondville has been assembling school minibuses for 60 years, and it has included an all-electric version available since 2018.

Other electric bus projects are under development. For example, Longueuil-based Letenda obtained support from the Government of Québec to develop the Electrip, an electric bus made of aluminum.

Recreational vehicles, such as snowmobiles and personal watercraft, are also candidates for electrification. After all, not only are modern electric vehicles quite efficient, they're also quieter and more respectful of the environment. That makes them much more enjoyable to drive. Several Québec companies already offer this type of vehicle or have announced that they are under development.

Moving towards a Québec battery and part industry

Batteries are the most valuable component of electric vehicles, which is why there is significant interest in more thoroughly developing this industrial sector in Québec.

The market for electric vehicles is expected to grow rapidly over the next few years, with the battery market following close behind.

As it stands, battery production in North America will not be able to support that growth. New factories will be essential.

Québec needs to seize this business opportunity and develop its battery industry so that it can enjoy the potential economic benefits, which include the creation of thousands of new well-paying jobs.

Québec is fortunate to have the mineral resources needed to manufacture batteries, such as lithium, nickel, cobalt, graphite, and silicon. It also has clean, abundant, and affordable electricity, which can be used in the production of certain components.

Québec is also well positioned geographically: 80% of the battery needs of North American automobile manufacturers are located within 1,500 km of Québec. Moreover, it boasts a highly competitive business environment.

If Québec wants to develop this sector, it must act now, and the government intends to play an active role in doing so. Major investments and the attraction of global players in the sector will be needed if Québec's battery industry is to reach its full potential by 2030.

These investments may involve the mining, refining, and processing of strategic mineral resources for the manufacture of batteries in Québec. The processing of critical minerals in Québec will be an important part of the government's strategy. The aim is to develop a complete, efficient supply chain, from mining to battery manufacturing. The government may also support projects to manufacture key battery components like anodes and cathodes in Québec and export them. These components make up a significant portion of a battery's value and therefore have significant potential.

Innovation in the battery sector

Québec's engineering and innovations are key factors that will allow it to position itself in the development of next-generation batteries.

More than 40 innovation players, employing over 1,000 people (including 400 researchers), are active in Québec and working on research and innovation in the battery sector. In fact, more than 850 of the patents already granted in the field are from Québec.

Québec, and particularly Hydro-Québec's Centre d'excellence en électrification des transports et en stockage d'énergie, already has an international reputation for its cutting-edge research in the battery sector. Québec's work on solid-state batteries, which could well be the next generation of batteries and offer greater range, is already at the forefront and we have everything to gain by pursuing it.

That being said, it is important that Québec's advances fuel the development of its battery industry as a priority.

Recycling batteries

Batteries are difficult to process in an environmentally friendly way once they have reached the end of their useful lives. However, Québec can ensure that end-of-life batteries are recycled and their parts are recovered—a market that is still emerging in North America. In fact, Québec is in a good position to become a major player thanks to its low energy costs and productive workforce.

Québec-based companies and research centres are currently working on developing processes to recycle battery parts. The government is already supporting research and development in this area.

Eventually, elements recovered from batteries could replace mining materials, and do so at a competitive price.

Charging infrastructure

Charging stations, which are already being produced in Québec, will create an additional opportunity for development.

Similarly, the development of the electric vehicle market beyond Québec's borders opens up many growth opportunities for the companies active in this sector, as well as significant export prospects for Québec.

Québec-made charging stations

Québec has two manufacturers of charging stations: Québec City's AddÉnergie, which has an assembly plant in Shawinigan, and Grand-Mère's Elmec, which designs and manufactures a complete line of residential and commercial charging stations.

Both manufacturers offer smart, technologically advanced charging stations that comply with global automotive standards.

For instance, thanks to the *Développement mobilisateur de véhicules lourds innovants 100% électriques (VLIÉ) project*, AddÉnergie has developed a 100 kW charging station that charges twice as quickly and intensively as current fast charging stations. It can be used not only for electric cars, but for some heavier electric vehicles as well.

Innovating in numerous areas

The global transport industry is undergoing major changes. Québec can carve out a strong position in niches related to this transformation by supporting the development of industrial sectors related to this dynamic and highly strategic field.

The government will support collaborative research, the development of technology demonstrators, and innovative or niche products and their entry onto the market.

There is a growing need to integrate information and communication technologies (connected vehicles, transport-on-demand services, smart transport systems, etc.). These changes, which are likely to improve energy efficiency in the transport sector—and thus reduce greenhouse gas emissions—will come with numerous business opportunities that can support Québec's economic development.

Aerospace: another environmentally innovative sector

The global aerospace industry, with government support, has been undergoing a technological and regulatory shift towards eco-efficiency for several years now. Like the automotive industry, the global aerospace industry is now moving towards hybrid electric and all-electric power for small aircraft.

Québec has a well-developed aerospace sector and can take advantage of these efforts to reduce its greenhouse gas emissions.

This shift will require significant investments in R&D to develop and refine new aerospace technologies, which can range from advanced manufacturing to the safe storage and management of energy to the generation and transmission of electricity. The work from these research and development efforts should pave the way for new aerodynamic aircraft bodies that will enable the design, development, certification, and release of new aircraft with lower carbon footprints.

Support for the development of eco-friendly aircraft

A mobilizing project called *Smart Affordable Green Efficient, or SA2GE*, has been established to support Québec's aerospace industry as it adapts to new environmental regulations.

The government provides financial support to private companies for mobilizing projects such as this and encourages universities, public research centres, and subcontracted SMEs to pool their efforts to develop an innovative product, process, or service.

3.2 Other strategic sectors

The electrification and climate change efforts undertaken by the government with the **2030 Plan for a Green Economy** are paving the way for the development of many other economic sectors.

Physical or chemical ulitization and sequestration of carbon

If greenhouse gas emissions cannot be prevented or eliminated, they may potentially be utilized or sequestered.

Most carbon sequestration and utilization technologies are still in the development stage. Nevertheless, they represent interesting prospects for both economic development and the fight against climate change.

Research and development projects for these technologies are emerging in Québec. They could open up significant potential in the years to come.

Green and smart buildings

The concept of “green buildings” is characterized by the use of innovative and more environmentally responsible construction practices, from design through to use. As for “smart buildings,” the term refers to the optimization, interrelation, and better management of building components, particularly with the use of information technologies. Expertise in this area is used to create more carbon and energy-efficient buildings. The efforts to decarbonize the building sector will be able to build on this expertise and grow the sector in Québec.

Québec has also developed expertise in green buildings, including the life-cycle analysis of buildings and the calculation of greenhouse gas emissions in construction. This expertise largely comes from research groups and chairs that are active in Québec.

Wood products and materials with low carbon footprints

In buildings, the high demand for innovative, eco-friendly building materials will support the forestry and wood construction sectors.

The Government of Québec wants to increase the forestry sector's contribution to Québec's economy. To that end, it will support the growth of the wood construction industry, the emergence of new products and innovative projects that contribute to the reduction of greenhouse gas emissions, and the use of residual forest biomass as an energy source. That support will foster a shift towards a new forest-based bioeconomy.

Carbon management

The past several years of efforts to fight climate change have helped build a Québec industry specialized in greenhouse gas emissions management.

Companies in this sector work in areas like the quantification and auditing of greenhouse gas emissions, the identification and implementation of solutions to reduce greenhouse gas emissions in all sectors (for both individuals and businesses), innovation, climate finance, and the sequestration or offsetting of emissions.

The government will support the growth of this sector over the next few years.

Green and resilient infrastructure

Preventing risks and protecting communities' health, safety, and well-being will require significant investments. At the same time, it will open up development opportunities for many businesses and trades, particularly in the construction sector.

In the coming years, significant investments will also be made to protect communities from flooding and coastal erosion. Green infrastructure and greening will also become more prominent in urban areas, where they will benefit citizens by helping to limit heat islands and local overflows and flooding.

4.

INNOVATION DRIVING THE ECONOMY OF TOMORROW

The development of solutions to electrify the economy and fight climate change will provide plenty of opportunities for innovation.

That innovation will lead to the birth of new companies, the growth of existing companies, and the export of Québec's expertise on the development of solutions for electrification and the fight against climate change.

Some of these solutions are already known, but various issues, such as cost, access to financing, complexity of their implementation, and social acceptability, can delay the deployment of innovations.

Strengthening the links in the innovation chain

The most promising ideas need to move from research and development to demonstration and then to release or implementation in businesses and municipalities. For innovations to be implemented at some point, every link in the innovation chain must be strong.

Support for the innovation chain will allow cutting-edge technologies and practices to emerge. Additionally, both technological and social innovation are necessary to achieve climate change objectives.

Strategic niches of innovation

The government will be targeting strategic niches of innovation for specific support.

These promising niches are constantly evolving. As a result, the government will use an agile approach in order to ensure that its support for innovation continues to have a very high potential for success.

The entire innovation chain

With the **2030 Plan for a Green Economy**, the government will support the entire innovation chain for electrification and climate change, from research and development to commercialization and deployment.

In addition, it will adapt programs for the entire innovation chain to meet the needs of electrification and the fight against climate change.

The government will also be employing the levers at its disposal for innovation and research. At the same time, it will strengthen dialogue and collaboration with key players in the research and innovation community so that the needs of the climate transition can be better addressed collectively.

Businesses will also be encouraged to innovate, as they are key to making current and future technologies more affordable. Similarly, the government will support and incentivize private clean technology investors to diversify sources of financing.

International and interdisciplinary collaboration across multiple sectors will be fostered and deployed in keeping with Québec's partnerships and priorities for international action.

PART THREE

ADAPTING TO CLIMATE CHANGE

The **2030 Plan for a Green Economy** is a new tool to drive climate change mitigation efforts.

It is necessary for, society to adapt to both current and future impacts of climate change, that Québec cannot avoid.

These adaptation efforts will be based on science and will follow the sequence: learn, prepare, act.

It is also in our best interest to act preventively by protecting the health and safety of citizens, adapting infrastructures and Québec's economy, and protecting ecosystems and biodiversity.

Land use planning is a powerful tool that must be leveraged for adaptation.

1.

ALREADY NOTICEABLE IMPACTS

1.1 Significant impacts

Québec is already being affected by the impacts of climate change. Those impacts vary by regions and their consequences are experienced differently from one community to another.

Floods

Floods are one of the natural risks related to climate change that affect many regions of southern Québec. They have particularly damaging consequences for citizens, communities, and infrastructures. The frequency and intensity of floods could increase over the next few years, in all seasons.

Coastal erosion

Coastal erosion and flooding are major issues for the Bas-Saint-Laurent, Gaspésie, Côte-Nord, and Îles-de-la-Madeleine regions, where most socio-economic development has taken place along the coasts.

Rising sea levels, combined with reduced ice cover and more intense storms, are accelerating coastal erosion and putting communities and infrastructures at risk. It is estimated that 65% of the coastline in these regions is susceptible to erosion; some areas may even lose an average of two meters of coastline per year[16].

If adaptation measures are not put in place, more than 5,000 buildings and nearly 300 km of roads could be affected by erosion by 2065, potentially costing nearly $1.5 billion over that period.

16. Université du Québec à Rimouski (2020). *Comprendre et prévenir l'érosion côtière dans un contexte de changements climatiques*, [Online], Université du Québec à Rimouski, [https://www.uqar.ca/nouvelles/uqar-info/3189-comprendre-et-prevenir-l-erosion-cotiere-dans-un-contexte-de-changements-climatiques], February 11, 2020.

Different impacts across Québec's regions

Québec's northern regions are being more rapidly and severely affected by climate change than their southern counterparts. Thawing permafrost can pose a significant risk to the integrity of buildings and infrastructures and hinder travel on the territory. Additionally, shrinking ice cover, stronger storms, and changes to ecosystems and species compromise traditional practices and food security.

In the south, heat waves are causing more hospitalizations and deaths. More frequent and intense heavy rainfall can cause overflows of stormwater systems and short-term flooding in urban areas. More frequent winter thaws and more numerous and intense storms are prematurely aging infrastructures and affecting citizens' safety and everyday lives. They are also severely affecting certain important recreational and tourist activities, such as winter sports.

Expected changes to the water regime are also likely to affect ecosystems and alter the quality and availability of water used by individuals and businesses.

An integrated action in the North

The speed and importance of climate change impacts in the North, in addition, to the particularities of this immense region composed of small isolated communities, the sociocultural characteristics of its residents, and the rapid growth of the Indigenous population, call for an action specific to this region relative to climate change adaptation.

Special attention must be paid to the region's abundance of natural resources (forests, mines, hydroelectricity), which have a high development potential, and the lack of knowledge on the impacts of climate change.

Health and safety, infrastructure, the economy, and ecosystems and biodiversity are all worth addressing together. Furthermore, action in this region must be carried out in collaboration with Indigenous communities and local organizations.

Impacts in many areas

Health and safety

Climate change is posing increasing risks to the health and safety of individuals and communities.

For instance, more frequent and intense heat waves, extended pollen seasons, and the spread of vector-borne diseases like Lyme disease are all affecting people's health. The availability and quality of drinking water may also be an issue.

Climate change itself, as well as changing, unusual, or extreme weather conditions and natural disasters, all have psychosocial consequences; they affect the safety and well-being of the population and can lead to social tensions.

Certain individuals and groups are more vulnerable to climate change and its impacts because of their geographic location, physical or financial limitations, or lack of social support. This is particularly true for northern and Indigenous communities. Children, seniors, and people with certain chronic illnesses are also more vulnerable. Climate change can exacerbate existing inequalities.

Infrastructures

The integrity and durability of infrastructures can be affected by climate change when they are located in at-risk areas or exposed to more severe, intense, or frequent weather events or conditions. Infrastructures must remain functional and safe to keep the economy running smoothly and to ensure that citizens can receive services, and proper functioning of essential services in the event of a disaster.

The economy

Climate change has direct and far-reaching effects on many economic activities and significantly affects certain seasonal industries.

Climate change experienced in Québec or elsewhere in the world may affect the integrity of industrial and manufacturing facilities, the stability of certain supply chains, or the price of certain raw materials. Climate change is likely to alter global food production, migratory movements, the spread of vector-borne diseases, and geopolitical security and stability, which may also affect the global economy and, by extension, Québec's economy. This is one reason why collective commitment to the climate transition is so important.

Some economic sectors are more directly affected by climate change. Agricultural production, fisheries, aquaculture, forestry, and tourism are among the most vulnerable sectors to the impacts of climate change.

Ecosystems

Climate change is also altering terrestrial and aquatic ecosystems and biodiversity. Habitats are degratating, invasive and nuisance species are spreading more quickly, more vulnerable species are disappearing, and so on.

The unprecedented speed of changes is challenging many plant and animal species' abilities to adapt. The changes are also damaging ecosystems that have already been fragmented and weakened by human activity. Changes to ecosystems and subsistence species are putting the livelihood activities and food security of northern and Indigenous people at risk.

Taking advantage of some of the effects of climate change

Despite the negative consequences of climate change, it does come with some positive impacts, including in the agriculture, fisheries, and tourism sectors.

Hydroelectric power is also likely to benefit from Québec's warming climate, as the energy reserve will increase and demand will drop due to rising temperatures.

Québec must be able to take advantage of these opportunities as part of the climate transition.

1.2 Learn, prepare, and act

With the **2030 Plan for a Green Economy**, the government recognizes the importance of knowledge development and adaptation trajectories that will allow the planning of its interventions in a structured way.

These interventions should be based on the following principles:

- Taking a risk-based approach that allow the identification of issues for which it is a priority to intervene;
- Using preventive action to limit the damage and the costs of climate change; and
- Considering the future climate.

Adapting to climate change will require us to follow the sequence "learn, prepare, act".

Climate of the future: adapting to tomorrow's climate

The climate influences the good performance of the economy and lifestyles of all communities. A large part of our environment (natural, built, economic, and social) has been designed or has evolved based on the idea that the climate is stable.

However, with global warming, the climate of the past is no longer an indicator of the climate of the future. It can no longer serve as a reference to predict the climate of the future or plan our economies, societies, and living environments.

From now on, decisions will have to be made with the future climate—and the uncertainties associated with it—in mind.

Learn

The government will encourage collaborative, inclusive, and multidisciplinary knowledge development. In doing so, it will promote the simultaneous consideration of the social, environmental, and economic dimensions of adaptation. Local knowledge will be considered, as well as traditional and Indigenous knowledge and practices.

Field and geospatial data acquisition, climate and climate change monitoring networks, and climate models will all play a key role in understanding current and future changes for Québec. This information makes it possible to obtain up-to-date evidence so that we can not only track climate change and its effects on Québec, but also anticipate the climate of the future.

The government will continue to invest in monitoring networks and in the refinement of models for anticipating the future climate.

Mapping key climate change risks is also essential to the adaptation process, as well as risk analyses. This mapping will be complemented by taking into account future climate, expanding it to uncovered areas and increasing its accuracy in inhabited areas. Maps will also be made easily accessible to everyone who needs them to make decisions—from municipalities planning land use to citizens who want to acquire property, to companies that are preparing investments.

The government will also support the completion of future climate risk analyses so that stakeholders can more accurately identify the risks to which they are exposed.

Prepare

Strengthening the capacities of the various stakeholders to anticipate, prevent, and manage risks associated with climate change involves developing skills, training the workforce, and sharing tools to support adaptation efforts.

The government will support this capacity building, as well as the implementation of plans and identification of climate change adaptation solutions. In order to prepare for a structuring action, focus will be put on the development of multi-risk adaptation roadmaps at a regional scale or for vulnerable economic sectors or targeting major risks.

Regional and local stakeholders will be involved in developing adaptation trajectories for certain major risks, such as flooding, coastal erosion in the Estuary and Gulf of St. Lawrence, and thawing permafrost. This will facilitate the implementation of sustainable, strengthening adaptation solutions.

Act

Even as it addresses needs for knowledge development and planning, the Government of Québec is already taking action to improve its resilience to the impacts of climate change.

The government will strengthen its support for the implementation of sustainable adaptation solutions that focus on prevention and take the future climate into account.

2.

ACTING PREVENTIVELY

It is in Québec's best interest to prevent the impacts of climate change.

We are already experiencing effects on health and safety, the economy, infrastructures, and ecosystems, and they are having consequences for public and individual finances alike. As global warming takes place at an accelerated rate, the impacts of climate change—and the associated costs—will increase significantly over the coming years and decades.

Much of these costs, as well as the human and environmental damage that accompanies them, can be avoided by acting preventively through strengthening the resilience of the economy, communities, the environment, and infrastructures.

It is estimated that every dollar invested in disaster prevention saves an average of six dollars, including the costs of replacing and repairing public infrastructures and buildings as well as compensation costs[17].

Adaptation solutions often contribute to the achievement of other economic, social, or environmental objectives. Given the benefits of implementing these solutions, many investments in adaptation will prove to be less costly than maintaining the status quo. They may even be profitable.

Preventive investments

Preventive investments will be needed to lay the foundations for a robust and dynamic economy.

These investments will strengthen the operational and financial capacities of the government, municipalities, and businesses to deal with a changing climate and its consequences. They will help reduce damage, which in turn will lead to savings; for instance, fewer roads may be damaged and fewer people may need to be moved or hospitalized. The money saved can then be reinvested in the economy and in services for citizens rather than in repairing damage.

17. Government of Québec (2018). *Plan d'action en matière de sécurité civile relatif aux inondations – Vers une société québécoise plus résiliente aux catastrophes*. Based on data from the U.S. National Institute of Building Sciences.

Action in four directions

Acting preventively means:

- Protecting the health and safety of citizens
- Adapting infrastructure
- Adapting Québec's economy
- Protecting ecosystems and biodiversity

2.1 Protecting health and safety

The healthcare system

The healthcare system plays a key role in supporting communities and individuals in the face of climate change and during extreme events or disasters that compromise people's health and well-being. In fact, it is one of the cornerstones of community resilience.

Focus will be placed on preventing the hazards associated with climate change. However, the healthcare network will also need to be able to adapt its response capacity, both in terms of diagnosis and treatment, as the issues related to climate change evolve.

It will be essential to train actors in the healthcare network and raise their awareness so that they can take into account the impacts of climate change. The network will also work with municipalities and businesses, as they will have their own responsibilities regarding workers' health and safety.

Drinking water supply

The drinking water supply could be affected by climate change and become a public health concern. Therefore, an assessment of the potential impact of climate change on drinking water sources will need to be initiated.

Working with the community

The government is hoping to limit the increased number of people, properties, and activities affected by disasters. Its approach involves supporting the development of equitable and concerted solutions with the community to reduce psychosocial repercussions and long-term costs for society as a whole.

The Government of Québec will work with municipalities to support preventive measures, such as the consideration of future climate risks in land use and urban planning choices, in order to develop healthy, dynamic, and sustainable living environments in a changing climate.

Essential networks and systems will also need to be resilient in the face of climate change; like the civil security system, they will play a key role in crises and disasters. To ensure the civil security system's ability to respond, the government will be equipping municipal stakeholders and its own public administrations with information on the extent and development of climate change risks. Those actors will be able to take that information into consideration as they adapt their prevention and intervention processes and tools.

2.2 Adapting infrastructures

Québec's infrastructures need to be adapted and resilient to face the impacts of climate change.

It is important to plan the location, design, construction, rehabilitation, and maintenance of infrastructures with climate change in mind to ensure their sustainability and to limit repair or replacement costs.

Several types of infrastructure will need to be adapted to climate change, including:

- Transport infrastructures (including roads, railways, ports, and bridges), which must remain functional to ensure that people and goods can stay safe and mobile;
- Electricity production infrastructures and energy transport and distribution infrastructures, which may be damaged and have their production capacity modified by climatic conditions;
- Urban drainage infrastructures, which must remain effective even during flash floods and heavy rainfall;
- Dams, whose design and management must account for changes in water regime;
- Buildings, which must be adapted to changing climate conditions;
- Water supply and distribution infrastructures.

Standards and regulatory tools

The government will establish standards and regulations to ensure that infrastructures are designed, located, and managed taking into account climate change.

The goal is to develop and maintain an adapted built heritage that will in turn contribute to the resilience of all Québec society.

Green infrastructures

Green infrastructures, and those designed to protect communities and property from the impacts of climate change, will be needed to reduce risks related to flooding, heat, and coastal erosion. Their importance and economic value will be factored into public decisions, including land use planning.

"Green infrastructures" are natural or engineered systems that provide benefits like the mitigation of urban heat islands and the absorption of rainwater into the soil while contributing to the well-being of individuals and communities.

Creating and maintaining green infrastructures requires extensive knowledge in infrastructure design, which extends not only to fields like engineering and architecture but construction and horticulture as well. This type of infrastructure will be favoured because of its many benefits for the environment and citizens' quality of life.

By adapting infrastructures during the design stage rather than intervening after the fact, municipalities and the government will be able to save significant amounts of money.

2.3 Adapting Québec's economy

Adapting Québec's economy to the impacts of climate change will contribute to its prosperity, both in the short and long term. With the **2030 Plan for a Green Economy**, the government aims to make it a common practice for businesses to account for the impacts of climate change.

Profitability in several sectors

Adaptation investments are particularly important for sectors that may become less profitable, or lose profitable investment opportunities, due to climate change.

These sectors—which include agriculture, forestry, fisheries, aquaculture, and energy production—are dependent on natural resources that are being affected by climate change. Without adaptation measures, yields and sales revenues could drop and new development opportunities could vanish.

In an increasingly service-oriented economy, the tertiary sector will also have to adapt to climate change. The tourism, insurance, and finance industries are among those that are increasingly understanding the impacts of climate change on the sustainability of their operations. As a result, climate change is becoming a greater factor in their business decisions. This has major implications for companies that are seeking financing or, like citizens and municipalities, insurance. For that reason, adapting to climate change has become part of a sustainable economic development approach.

The government will support businesses and economic sectors by making tools and information available so that they can incorporate adaptation issues into their business strategies.

2.4 Protecting ecosystems and biodiversity

With the **2030 Plan for a Green Economy**, the government will be monitoring how climate change is affecting species and ecosystems to better support their conservation.

This monitoring will make it possible to assess how climate change impacts are progressing in Québec and guide interventions to better protect natural environments, including species at risk and those of particular cultural or economic importance.

Conserving ecosystems and their connectivity help create migration corridors and preserve species. This type of intervention is becoming more widespread as the climate changes.

It is also important to determine how climate change will affect the quality and availability of water, as this will inform the implementation of adaptation measures where needed.

3.

LAND USE PLANNING: A POWERFUL TOOL FOR ADAPTATION

In addition to helping reduce greenhouse gas emissions, land use planning is a powerful tool for adaptation that has a direct effect on resilience to climate change.

Sustainable land use planning allows people to adapt to the impacts of climate change while accounting for the current and future risks that the region and its human activities may encounter.

Development choices will make it possible to create safe, healthy, and sustainable living environments that are less vulnerable to the impacts of climate change.

- Natural environments play an essential role in adapting to climate change. For instance, they can serve as buffers for flooding, help manage rainwater, and mitigate urban heat islands. This is yet another reason to better manage urbanization.
- Greening will be supported and encouraged in cities, as it helps to mitigate some of the consequences of climate change while improving communities' attractiveness and individuals' physical and mental health.

Municipalities and regional county municipalities, have significant responsibilities when it comes to land use planning and it will be necessary to rely on their expertise and leadership

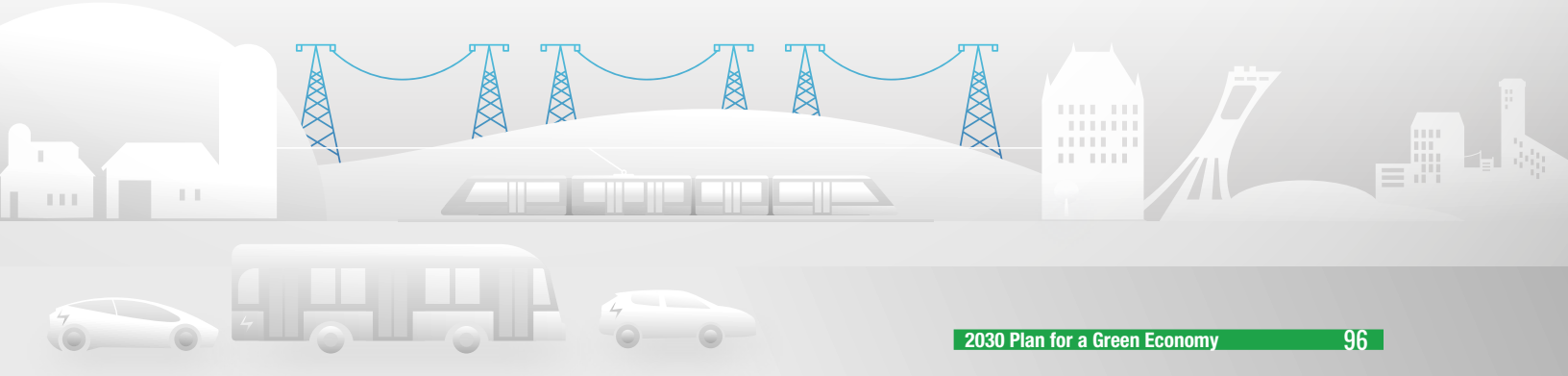
Considering land use planning so that populations can adapt will involve reviewing laws, regulations, design approaches, and many other factors that guide planning.

4.

GOVERNMENT AS A ROLE MODEL

The government will set an example when it comes to adapting to climate change by factoring the future climate into location choices and the design and management of its networks and infrastructures.

It will take preventive action to minimize the consequences of climate change and the resulting costs.



DEPLOYMENT OF THE 2030 PLAN FOR A GREEN ECONOMY

The deployment of the **2030 Plan for a Green Economy** will be made possible by strong foundations, such as strong governance, funding that is up to the challenge, agile and effective implementation, and the mobilization of all stakeholders in Québec society.

1.

CREATING A SUITABLE, PREDICTABLE ENVIRONMENT FOR THE CLIMATE TRANSITION

1.1 Strong governance

The **2030 Plan for a Green Economy** will be backed by strong governance that is based on clear roles and responsibilities as well as thorough, transparent accountability. This governance will also aim to streamline administrative processes and make them more efficient.

The Plan will guide the government's actions and ensure their coherence through joint, coordinated efforts by its ministries and agencies.

Electrification and the fight against climate change will be integrated into the government's orientations, policies, and strategies. Decisions regarding transport, energy, economic development, and land use planning will therefore contribute to the objectives set out in the Plan.

An act to guide the new governance

The *Act mainly to ensure effective governance of the fight against climate change and to promote electrification*, which has been in effect since November 1, 2020, formalizes the principles and modalities of this new governance. The Act also stipulates that the greenhouse gas emissions reduction target for all of Québec cannot be less than 37.5% below 1990 levels. Furthermore, it includes a process for reviewing the decreed reduction targets at least every five years.

This act gives the Minister of the Environment and the Fight against Climate Change a lateral mandate and extends his powers to ensure a coordinated governmental approach in response to climate change.

As such, the Minister will ensure government-wide integrated governance of the fight against climate change. He will also be involved in the development of orientations and policies related to the Plan. This ensures that governmental and ministerial measures to fight climate change, as well as those proposed by certain public bodies, are both coherent and coordinated. Should a proposed measure be inconsistent with the principles and objectives in the Plan or the reduction targets for greenhouse gas emissions, the Minister may issue an opinion to recommend adjustments. He may also issue directives to ministries and agencies on methods for implementing and monitoring climate change measures.

The Minister of the Environment and the Fight Against Climate Change will leave it up to the government agencies responsible for specific elements to choose their means, as long as they comply with the principles and orientations of the Plan.

The Advisory Committee on Climate Change, which is largely made up of scientists, will issue public reports on all matters related to the continuous improvement of climate action.

The Auditor General of Québec, supported by the Sustainable Development Commissioner, has been given a new mandate that is directly linked to the Electrification and Climate Change Fund. The Sustainable Development Commissioner will report annually to the National Assembly on their findings and recommendations regarding the use of the Fund's revenues.

Accountability and access to data

Accountability for the **2030 Plan for a Green Economy** will be ensured through a system of transition indicators that is simple, effective, and meaningful to the public. These indicators will make it possible to assess the overall impact of Québec's progress, as well as the progress made with respect to the Plan's principles and orientations.

This process will ensure comprehensive monitoring and accountability. The Minister of the Environment and the Fight Against Climate Change will publish an annual report describing the progress of the climate transition. Finally, from an open government perspective, data will be made easily accessible.

1.2 Increased, innovative funding

The government will make substantial investments to support the climate transition over the next decade. The **2030 Plan for a Green Economy** will thus be supported by important financial means.

Significant resources will be required to implement the Plan and equally significant funding will need to be secured.

The implementation of the **2030 Plan for a Green Economy** will therefore rely on multiple sources of funding, both public and private. The financial resources devoted to this ambitious project for Québec's future must be seen as investments aimed at transforming the economy.

Resources from the carbon market

Funding for the Plan will rely mostly on resources from the carbon market.

This market generates revenues that must be entirely devoted to the fight against climate change, specifically reducing Québec's greenhouse gas emissions and supporting adaptation.

Revenues from the carbon market will be managed through the Electrification and Climate Change Fund. The government will implement measures to ensure the effective and appropriate allocation and management of these resources.

Other sources of financing

Other means of financing will also be leveraged.

Budgetary resources

The climate transition will require greater investments than ever because of the efforts needed to build a low-carbon economy by 2030, as well as the needs to be addressed in order to adapt to a rapidly changing climate.

The government will therefore add other budgetary resources to the revenues from the carbon market.

Funding from government entities

Government entities will be called upon to broaden their scopes in order to better contribute to the fight against climate change.

In particular, Investissement Québec has a strategic role in stimulating innovation. It is able to unify the technical and financial spheres to provide the right incentives to the most promising projects. The mission entrusted to the organization states that it "carries out its mission in keeping with the principle of sustainable development by promoting respect for the environment and the achievement of the Government's objectives with regards to the electrification of the economy and the fight against climate change."

With this in mind, the Natural Resources and Energy Capital Fund has been created to support, through equity investments, companies active in sectors such as the following:

- Production, storage, transmission, and distribution of renewable energies or fossil fuel substitutes, provided, in the latter case, that these substitutes reduce greenhouse gas emissions or contribute to the supply of clean energy or hydrogen in Québec;
- Development, commercialization, and implementation of technologies that promote energy transition, innovation, or efficiency or reduce fugitive emissions.

Through its mission, Hydro-Québec will also contribute to various aspects of the electrification of the economy.

Blended finance

The **2030 Plan for a Green Economy** calls for the implementation of joint funding arrangements, including resources from outside the Government of Québec.

The government will innovate, in particular by encouraging public and private entities to share investments and risks. Public funds will be used to stimulate private investment, helping to better distribute risks. This risk management strategy will provide real leverage, both financially and in terms of the additional expertise that the private sector will bring. Furthermore, combining public and private capital significantly expands the amount of available funding.

The Government of Québec will also be able to ensure the financing of its infrastructures that contribute to the fight against climate change by increasing the value of its green bond issues.

Additionally, fund managers, whose capital would come from both private investors and the government, could offer not only financing, but also support for the implementation of projects.

Blended, innovative financing

Public investment has a catalyzing and prioritizing role to play in attracting private funding for a multitude of projects. The diversity and size of those projects will be critical in helping Québec achieve its climate change objectives and targets[18].

The financial community is committed to integrating climate risks, which will typically come with increasing costs, into investment decisions. Blended finance is therefore actively being promoted both domestically and internationally[19].

The climate transition will require the entire financial ecosystem—which includes private banks, public bodies, and energy-saving service companies—to mobilize in harmony to develop innovative financial and technical solutions, all while respecting the additionality principle.

Strategically mobilizing institutional investors' assets will support the Québec asset management industry that specializes in responsible investment, including ESG (environmental, social, and governance) factors, and thus maximize benefits in Québec.

18. Definition of blended finance [financement mixte] translated from page 1 of the working group on funding's final report.

19. Such promotion includes the following initiatives within the international community: The Investor Agenda for Climate Change, Climate Action cent+, The Net-Zero Asset Owner Alliance, and the Task Force on Climate-related Financial Disclosures.

A positive approach to green taxation

Québec already applies certain ecofiscal measures, the most notable being the specific fuel tax and the carbon market. Numerous tax breaks also help to promote “green” behaviour. The government will assess the applicability of using such measures in a positive way that does not increase the tax burden on taxpayers, but rather ensures greater fairness in environmental responsibility and recognizes the gains from certain actions that contribute to reaching the climate change objectives.

1.3 Agile, concerted implementation

The implementation plan

Over a ten-year horizon, the **2030 Plan for a Green Economy** will be deployed through an initial five-year implementation plan that will be updated annually to cover the next five years.

The first implementation plan covers the 2021–2026 period. It contains the objectives, measures, and actions that will be implemented during that period.

Annual review

Subsequently, the implementation plan will be updated annually. The annual updates will serve as opportunities to evaluate and adjust existing measures and add new measures as financial resources allow.

This approach will provide both predictability for partners and the flexibility to adjust interventions as needed.

Using the most recent data available

It is not possible to precisely predict what technological advances will bring, nor is it possible to truly know what the carbon market, the global economy, public acceptance, or even lifestyles will look like in the future.

The government will closely monitor the results of the measures implemented, the progress towards emissions reductions, and the development of potential reduction techniques. It will do so notably through targeted performance indicators that provide a clear assessment of the progress made. The monitoring will also rely on the expertise and modelling tools developed by Québec’s ministère des Finances and the ministère de l’Envionnement et de la Lutte contre les changements climatiques.

This approach will allow the government to seize opportunities in all sectors, adjust its action over time, and maximize reductions in Québec to achieve the target it has set.

Revision of the 2030 Plan for a Green Economy

The **2030 Plan for a Green Economy** will be evaluated after an initial five-year period and may be revised based on the results.

Clear responsibilities

The government will establish a clear division of responsibilities between the ministère de l'Environnement et de la Lutte contre les changements climatiques and other ministries and agencies. Each will be responsible for implementing certain measures in the implementation plan based on their individual missions, all in a context of interministerial collaboration. The specialized expertise of each ministry will be put to good use.

Similarly, the **2030 Plan for a Green Economy** will build on complementary policies and action plans, such as the Québec Energy Transition, Innovation and Efficiency Master Plan; the Energy Policy; the Sustainable Mobility Policy; Québec's International Vision; the Québec Plan for the Development of Critical and Strategic Minerals 2020–2025; and the Government Sustainable Development Strategy.

In addition, the vision and principles of the **2030 Plan for a Green Economy** will need to be considered in the implementation of policies, action plans, and other planning and policy tools of government ministries and agencies.

Mobilization approaches

Communication and engagement approaches are needed to better inform citizens about climate change issues and raise awareness of the solutions that are within their reach. Incentives will be put in place to encourage citizens, businesses, and municipalities to take action towards the electrification of the economy and the fight against climate change.

The government intends to maintain an open, transparent dialogue with civil society. Particular attention will be paid to raising environmental awareness and promoting eco-citizenship for all people, not just youth. This approach is part of the just transition.

Consumption choices, particularly in terms of transport, food, and residential heating, are the main ways for citizens to reduce their carbon footprints and directly participate in the climate transition.

Tools will also be made available to citizens and municipalities to help them measure their contributions to the fight against climate change.

The government will monitor these issues at the international level as well, since diplomacy, intergovernmental collaboration, and international climate cooperation play key roles in the fight against climate change. Québec will remain a committed player in this regard.

Municipalities

Municipalities are the main drivers of land use planning and local government. They are also key contributors to the success of the climate transition. After all, they have a direct influence on people's lifestyles.

As a result, municipalities can contribute directly to reducing greenhouse gas emissions and adapting to climate change in Québec through:

- Development and urban planning, which affect land use, exposure to climate change hazards, and the mobility of people and goods;
- Organization of public transit;
- Infrastructure planning and construction;
- Waste management.

Québec municipalities of all sizes are already demonstrating leadership and making the necessary changes in the face of current and future climate realities. This highlights the importance of basing the approach on local and regional realities to encourage initiative and support.

Given that everyone's contribution is needed to carry out the ambitious project proposed in the **2030 Plan for a Green Economy**, the government invites all Québec municipalities to adopt a climate change plan that complements the government's plan.

The federal government

The Government of Québec is counting on a full contribution from the federal government. This contribution will be essential for supporting investments in electrification and the fight against climate change, particularly when it comes to financing transport and infrastructure investments. That support will need to complement Québec's initiatives in order to maximize the impact of the **2030 Plan for a Green Economy**.

The federal government must do its part in the electrification of Québec's economy and the fight against climate change. However, its contributions must align with Québec's priorities and jurisdictions.

Québec has high expectations in areas such as funding for public transit and infrastructure. Furthermore, federal interventions must not interfere with the carbon market.

Like the Government of Québec, the federal government must become a role model in electrification and the fight against climate change, both in reducing greenhouse gas emissions and in adapting to climate change.

1.4
New methods in the public sector

This ambitious electrification and climate change endeavour calls for new ways of doing things in the public sector.

When it comes to electrification and climate change, the Plan's objectives and principles will be integrated into government orientations, policies, and strategies, particularly in the areas of land use planning, transport, energy, and economic development.

Considering the impact of the decisions that the Government of Québec must make regarding investments in the climate transition, it will continue to strengthen its internal tools (particularly in economic modelling and decarbonization) so that it can serve as the best role model possible.

1.5
Working closely with Indigenous peoples

In Québec, there are 11 Indigenous nations across 14 Inuit villages and 41 First Nations communities.

Vulnerability to climate change

First Nations and Inuit communities may be vulnerable to various impacts of climate change depending on their geographical location and way of life. Those impacts compromise the sustainability of the traditional practices on which their health, lifestyles, and quality of life rely.

Travel on the land for hunting, gathering, fishing and trapping is becoming less safe due to the shrinking ice cover on lakes, rivers, and the sea, as well as more unpredictable weather.

Ecosystem changes are also affecting wildlife and plants and challenge the accessibility, availability, and quality of traditional foods.

Climate change is therefore limiting access to resources under pressure and putting the food security of First Nations and Inuits at risk. These impacts are even greater for northern communities.

Northern communities are particularly affected by global warming, which is more pronounced in northern regions. Thawing permafrost is affecting human safety and community resilience by damaging buildings and infrastructures. Traditional trails to access the land are becoming more hazardous. At the same time, the shrinking sea ice cover and worsening storms are causing coastal erosion.

New business opportunities

Climate change can also come with benefits for economic development. For instance, it can trigger the creation of innovative solutions or the emergence of new business opportunities.

Several communities have already been involved in creating development projects and implementing or examining solutions for the climate transition. In addition to reducing greenhouse gas emissions, these projects create new, high-quality jobs and contribute to communities' economic development.

An essential collaboration

Working closely with Indigenous peoples is essential to ensure that designed and implemented climate transition measures are both appropriate and effective.

These measures must respond to the distinct needs and realities of First Nations and Inuit communities while integrating their traditional knowledge. This will allow to protect their traditional lifestyles, their health, and their quality of life.

2.

ACCELERATING THE DEVELOPMENT OF KNOWLEDGE NEEDED TO GUIDE THE TRANSITION

Mitigating and adapting to climate change will require us to transform our economy, our lifestyles, and our relationship with our environment. This transformation requires us to understand these complex systems, be able to assess the real effects of our interventions, and to identify the most promising courses of action.

Actions founded in knowledge

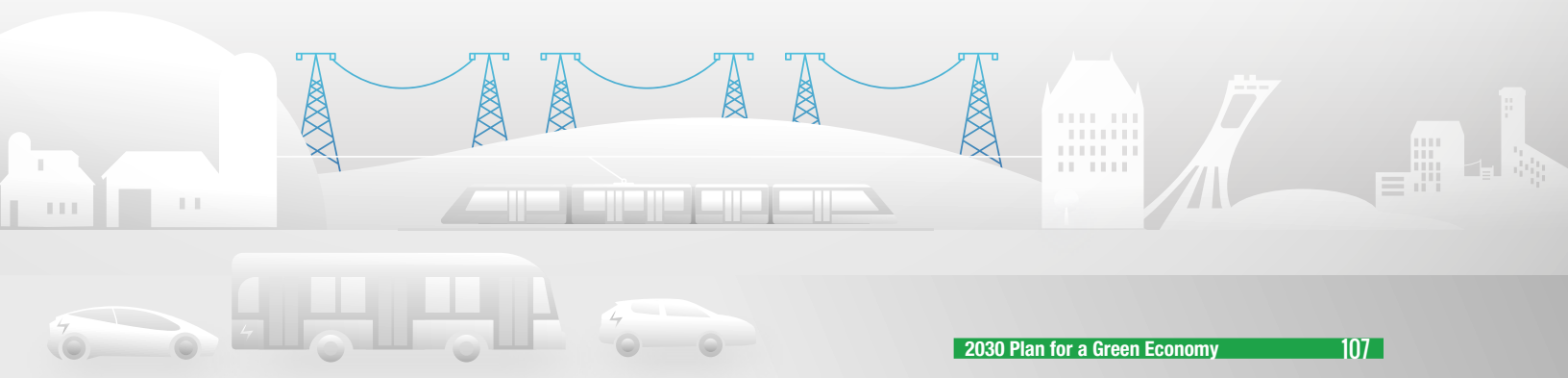
Several factors—including evidence, local knowledge, and expertise in social, environmental, and economic matters—are critical for guiding investments in the climate transition and helping us move faster towards our climate goals.

The government intends to build on this foundation by refining greenhouse gas emission inventories and strengthening the monitoring networks and projection models used to track greenhouse gas emissions and changes in climate. This knowledge helps us understand where our emissions are coming from and how global warming is affecting our land. It gives us insight into the future and determine the best courses of action going forward.

Strategic centres of expertise

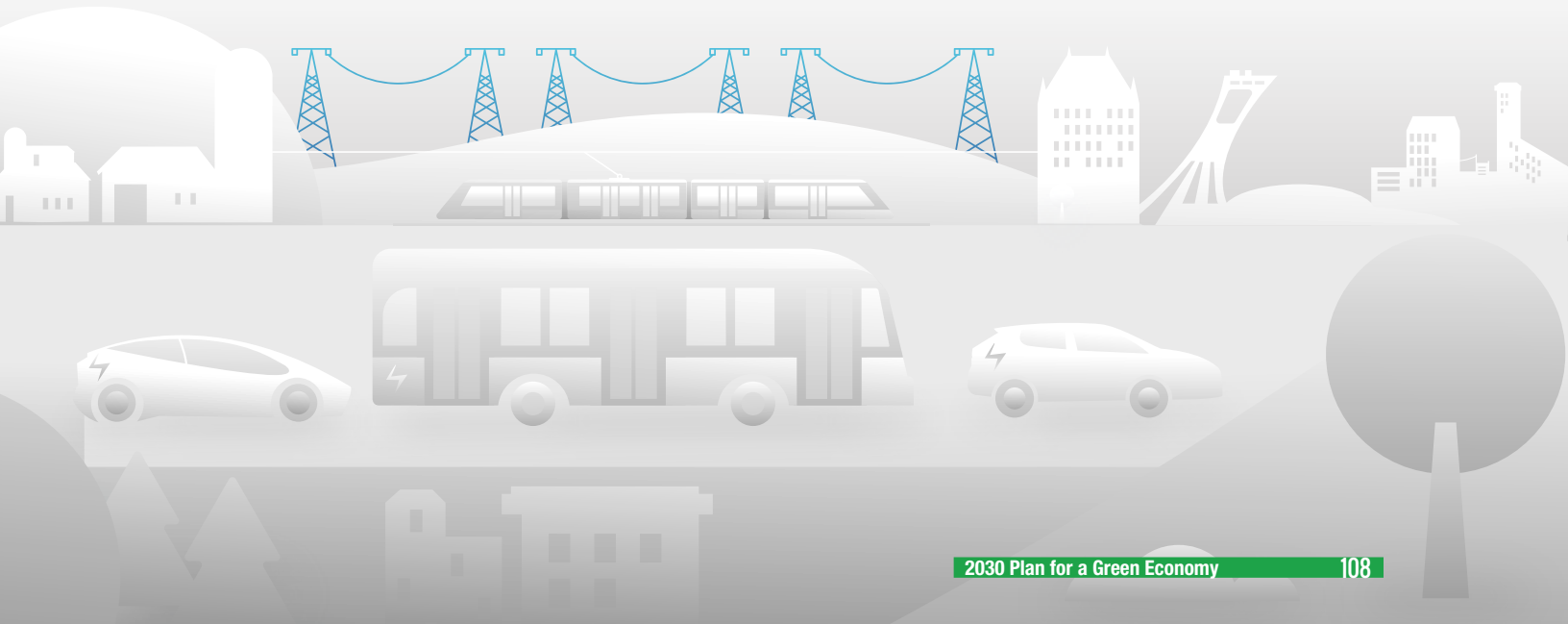
The government will support cutting-edge expertise. Québec must be able to count on strategic centres of expertise that integrate transition issues in their work and maintain close relationships with both researchers and those who use the research.

The Ouranos research consortium, which was created with government support in 2001, has enabled Québec to make substantial advances in climate science and adaptation.

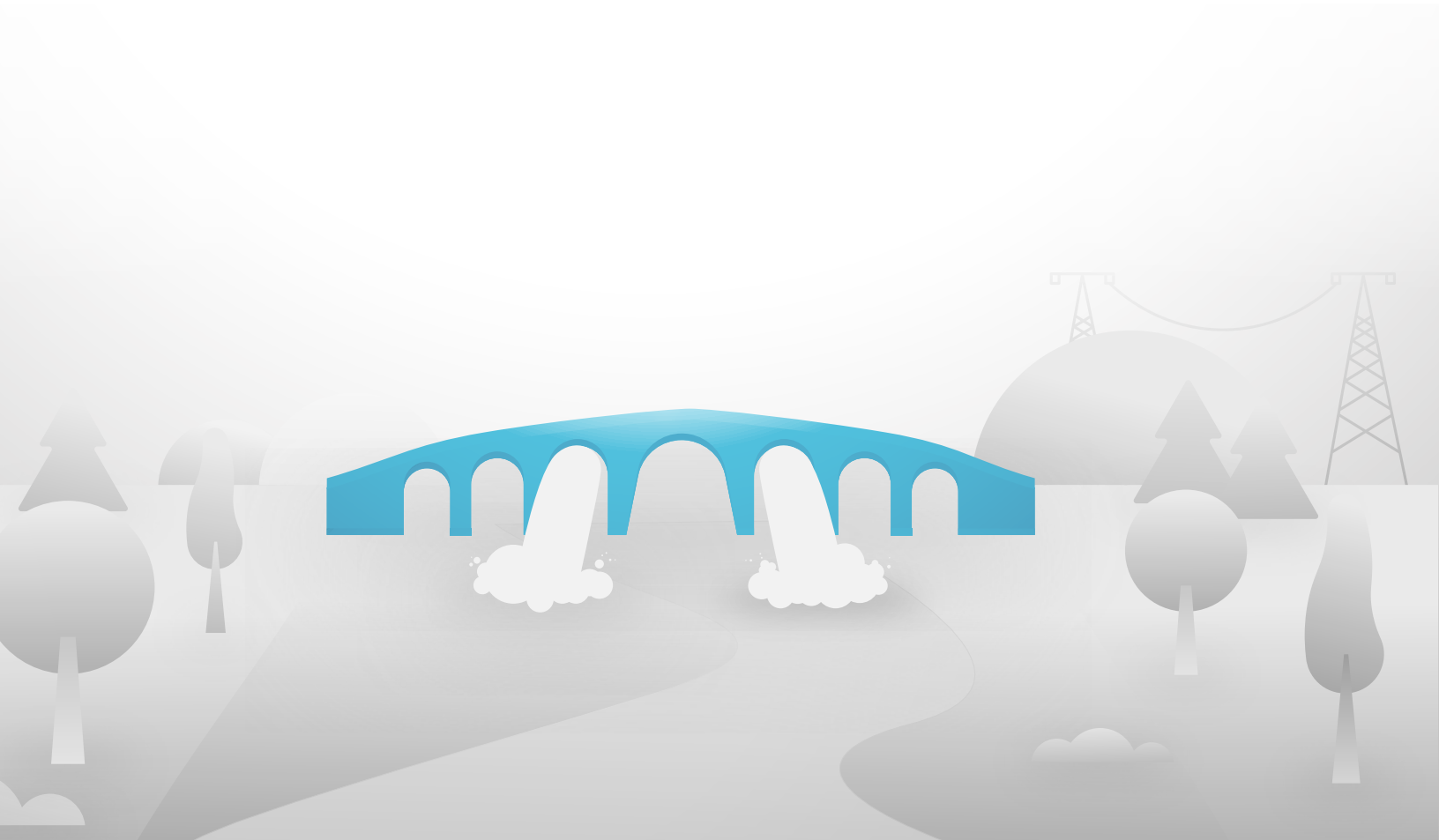


In the broader fields of climate change mitigation and the climate transition, several specialized centres of expertise have already been implemented. However, better structuring of research efforts around complex issues such as measuring the effects of our climate interventions, creating the best conditions for accelerating change, optimizing public policies, and innovating in climate transition financing is required, as is the strengthening of expertise in select niches.

The government will also ensure that Québec is able to respond to the complex issues surrounding the fight against climate change by supporting existing expertise, strengthening collaboration among stakeholders, and guiding research and innovation efforts.



APPENDICES



1.

QUÉBEC'S CAP-AND-TRADE SYSTEM

Québec's cap-and-trade system for greenhouse gas emission allowances was established on January 1, 2013. In January 2014, Québec linked its system to that of California within the Western Climate Initiative.

Principle

The cap-and-trade system operates on the principle of a market in which emitters can trade rights to emit a limited quantity of greenhouse gases. It determines the maximum quantity of greenhouse gas emissions those emitters can produce each year.

In the sectors and regions that use the market, it guarantees that greenhouse gas emissions will be reduced to desired levels over a given period.

This system reduces the costs associated with lowering greenhouse gas emissions by incentivizing emitters to make reductions where it is least costly to do so. The trading of emission allowances takes place within the Québec-California regional carbon market, which promotes the reduction of greenhouse gas emissions at a lower cost.

That being said, the partnership means that reductions from the cap-and-trade system may not all come from Québec, but elsewhere in the regional area covered by the market.

Coverage

In Québec, the cap-and-trade system covers approximately 80% of total greenhouse gas emissions, i.e. those of the industrial, transportation, residential, commercial, and institutional sectors, as well as electricity generation.

The sectors that are not subject to the market mainly produce non-energy emissions. Most of these emissions come from the agricultural sector (fertilization and animal waste) and waste landfilling and management.

Since 2013, the system has been directly targeting large industrial emitters.

Other sectors have been indirectly subject to the system since 2015 through fossil fuel distributors.

Setting caps

The government decrees an annual cap on the emission allowances it puts into circulation each year.

Reporting companies must hold emission allowances equivalent to their greenhouse gas emissions. To comply with regulatory requirements, companies can:

- Reduce their greenhouse gas emissions, for example by improving their manufacturing processes or reducing their consumption of fossil fuels;
- Buy emission allowances from the government when they are auctioned;
- Acquire allowances from other companies, either directly or through the secondary market;
- Receive free emission allowances, if they are subject to Canadian or international competition.

Supply and demand

The supply of emission allowances is essentially equal to the cap set by the government. Demand is defined by emitters' purchasing needs for emission allowances. The meeting of supply and demand then determines the price of the allowances.

Thanks to the carbon market, the government is in a position to invest significantly in structuring measures to help businesses and individuals in Québec make the transition to a green, prosperous, and resilient economy.

2.

A CLEAR COMMITMENT FROM QUÉBEC

Québec wasted no time in declaring that it would become party to international climate agreements, particularly the United Nations Framework Convention on Climate Change[20], the Kyoto Protocol[21], and the Paris Agreement[22]. The Paris Agreement is the first universal climate agreement. Its goal is to limit global warming to well below 2°C—and preferably to 1.5°C—above pre-industrial levels.

The Paris Agreement is an international commitment based on transparency. In other words, each country must publish their results.

Action since 2006

In 2006, the government developed a climate change action plan that spanned from 2006 to 2012. This plan included the initiatives undertaken directly by the government to address climate change. This plan was mainly financed by a levy on fuels and fossil fuels, which was introduced in 2007.

Eventually, the government realized that Québec needed a stronger and more comprehensive tool to further reduce greenhouse gas emissions.

The 2013–2020 Climate Change Action Plan framed its actions for the following years. The implementation of measures in many sectors have been mainly financed by revenues from the carbon market. The plan addressed the two components of the fight against climate change, namely mitigation and adaptation.

20. Decree number 1669-92 of November 25, 1992.
21. Decree number 1074-2007 of December 5, 2007.
22. Decree number 1052-2016 of December 7, 2016.

Reduction targets and objectives

Following consultations in parliamentary committee, and in line with its international commitments, the government has decreed greenhouse gas emissions reduction targets of 20% below 1990 levels by 2020[23] and 37.5% below 1990 levels by 2030[24].

Québec is also a member of the coalition of regions and federated states that signed the Under2 Memorandum of Understanding, or the Under2 MOU. Through this membership, Québec has stated its objective to reduce its greenhouse gas emissions by 80–95% below 1990 levels in order to limit global warming to less than 2°C.

International involvement

The nature of the climate transition requires extensive pan-Canadian and international collaboration. Over the past ten years, the Government of Québec has positioned itself as a committed player in this regard, both within and beyond its borders. This has resulted in a reputation as a leader in the field. In particular, it has entered into numerous bi- and multilateral partnerships for carbon pricing, electric mobility, green technologies, and adaptation to the impacts of climate change.

This commitment is reflected in various initiatives, as well as in Québec's membership in forums.

- Québec is a member of the Under2 Coalition, in which federated states and regions discuss their efforts to fight climate change.
- In 2015, Québec—in partnership with California and the Netherlands—founded the ZEV Alliance, which fosters intergovernmental collaboration to accelerate the adoption of zero-emission vehicles.
- Québec also supports the most vulnerable and exposed French-speaking countries under the International Climate Cooperation Program. On September 26, 2019, the program was named by the United Nations as one of the 15 winners of the Global Climate Action Awards, out of 670 applications received.

The Government of Québec intends to pursue its actions towards sustainable economic development and climate cooperation on both a national and international scale through the **2030 Plan for a Green Economy** and Québec's International Vision.

23. Decree number 1187-2009 of November 18, 2009.
24. Decree number 1018-2015 of November 18, 2015.

Objectives of Québec's action in Canada and internationnally

The government's primary objective, both in Canada and internationally, is to contribute to the global effort to fight climate change in an economically sustainable manner by:

- Entering into strategic, technological, research, and cooperative partnerships with other governments (including federal, provincial, and territorial governments) and with Canadian and international organizations to support an innovative, resilient, and low-carbon economy in Québec and beyond;
- Encouraging and supporting other governments in the creation of carbon pricing mechanisms to support the development of cap-and-trade systems with the goal of increasing the number of partners;
- Continuing climate cooperation efforts with the countries that are most vulnerable to the impacts of climate change, in particular the French-speaking countries of Africa and the West Indies.

Québec is also seeking to become a world reference in the fields of electrification of the economy, climate transition, and sustainable development by:

- Showcasing its abundant assets in terms of renewable energy, clean technologies, innovative companies, and centres of excellence;
- Seizing the opportunities offered by the climate transition to attract investment and export green technologies;
- Supporting Québec companies, organizations, and institutions in their export and collaboration projects in these areas.

By building on dynamic partnerships with governments and organizations at the international level, as well as on increased synergies between the private sector, the research community, and civil society, the Government of Québec will be in a good position to meet its international commitments and foster the development of a green, prosperous, and resilient economy.

3.

MAJOR CONSULTATIONS

The development of the **2030 Plan for a Green Economy** was preceded by major consultations between summer 2019 and winter 2020.

Ministers' tour

Between August 27 and October 15, 2019, four ministers of the Government of Québec met with approximately 550 stakeholders from all regions of Québec to discuss the challenges associated with the fight against climate change and the solutions needed to meet them.

Five working groups composed of experts and civil society representatives

Over the summer and fall of 2019, five working groups, composed of some 60 experts and representatives from civil society, worked on possible actions that the government could take as part of the **2030 Plan for a Green Economy**.

The working groups were established to address the areas of electrification, land use planning and adaptation, bioenergy, youth, and finance, respectively. Each group made recommendations and identified the principles and actions they considered essential to achieving the objectives set by the Premier.

Online consultation

From August 27 to October 31, 2019, the government held an online consultation to give the public an opportunity to express their opinions on the fight against climate change.

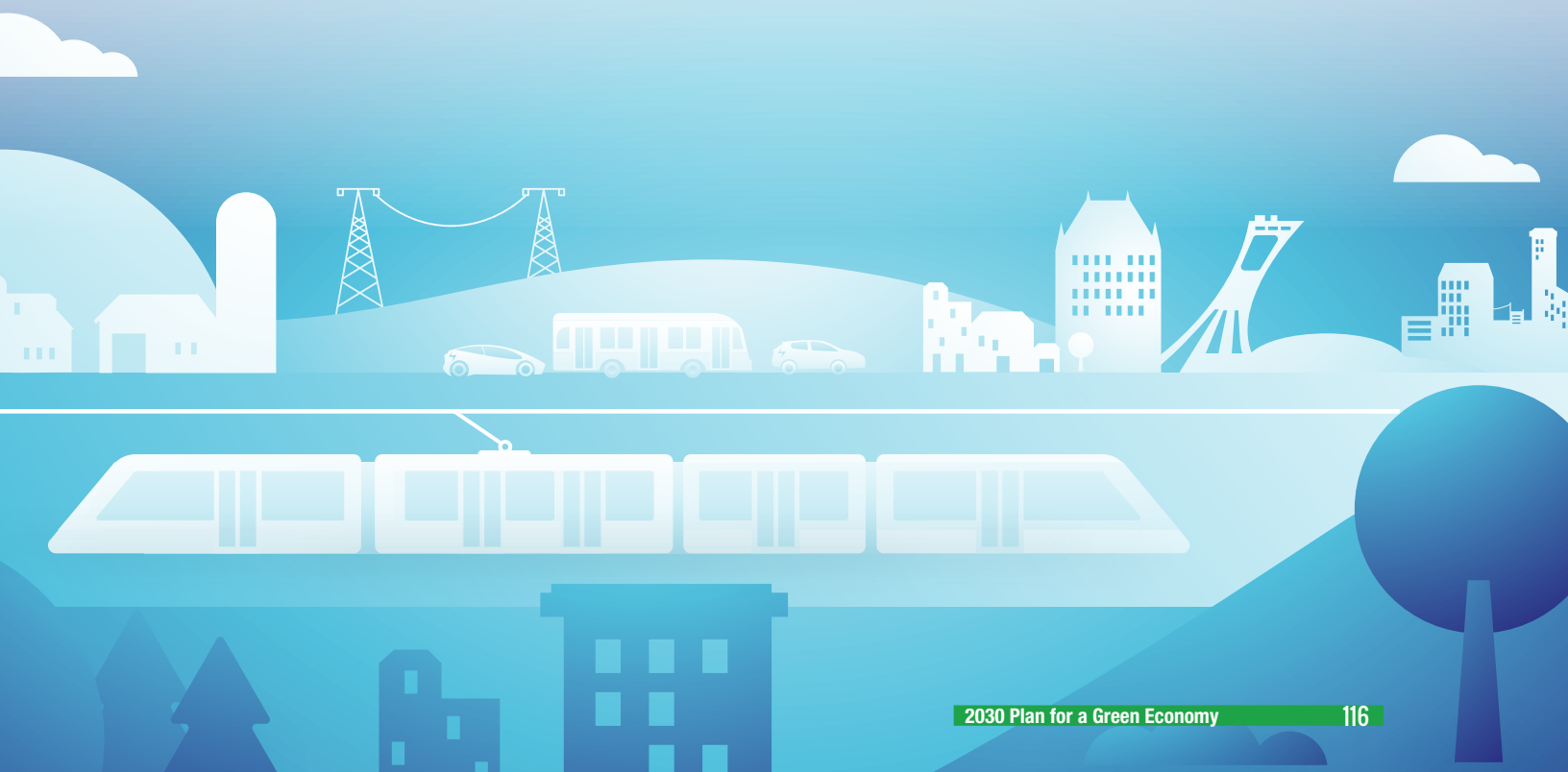
The government received 187 submissions and 3,200 completed questionnaires. The suggestions received and the opinions expressed were analyzed and contributed to the development of the Plan.

Consultations with Indigenous peoples

Throughout fall 2019 and winter 2020, meetings were held with representatives from regional organizations and First Nations and Inuit communities, in Eeyou Istchee James Bay for the Cree Nation, in Nunavik for the Inuit, and in Québec City for non-treaty First Nations.

Municipal consultations

Further consultation sessions were held between the government, municipal agencies, municipal associations, the City of Québec, and the City of Montréal. These sessions provided an opportunity for municipal representatives to share their visions and needs regarding electrification and climate change.



Environnement
et Lutte contre
les changements
climatiques

Québec