

Powering our Economy and the World with Clean Energy

OUR PATH FORWARD TO 2035



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Province of New Brunswick

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ISBN 978-1-4605-3846-3 (Bilingual print edition)

ISBN 978-1-4605-3845-6 (PDF: English edition)

ISBN 978-1-4605-3844-9 (PDF: French edition)

2023.12 | Printed in New Brunswick



Message from the Premier and Minister

Climate change and the need for decarbonization are creating an unprecedented energy revolution that has never been seen before.

Increased electrification is driving demand, new technology and sources of energy are being rapidly developed and energy security is becoming ever more important. Balancing this changing environment with its impact on our residents is a priority for our government.

New Brunswick is at the forefront of this energy transformation. With work underway developing small modular reactors (SMRs), hydrogen projects being proposed, and our natural resources like wind leading to increased investment and growth, we are not only seeing the impact but are positioning ourselves to take a leadership role in making it happen at home, regionally and globally.

An integrated energy strategy must balance our climate with the energy needs and demand across all users in our province. This will require the growth of renewables like wind and solar, additional baseload generation like nuclear through SMRs, new energy sources such as hydrogen and biofuels and regulatory changes to facilitate this transformation, while always balancing affordability for New Brunswickers.

We must also consider the development of our abundant natural resources whenever they can be used as near-term transition fuels, displacing higher emitting sources and lowering greenhouse gases (GHGs) at home and abroad as part of the path forward to net-zero.

Our actions today regarding energy strategy and planning will determine our future. We are pleased to release *Powering our Economy and the World with Clean Energy – Our Path Forward to 2035*.

This 12-year energy roadmap outlines a perspective on how the energy landscape will transition in our province, how the energy mix will change, the actions needed and the impact it will have.

Engaging with New Brunswickers on this strategy is critical. Therefore, as part of the release of this document we will be forming an energy transition working group to offer an opportunity for New Brunswickers to provide their input on actions and recommendations.

We have a generational opportunity in front of us to change the way we use energy to live and work that will lead to a cleaner environment while also creating an economic growth engine for our province.

We look forward to hearing your feedback and working together to support *Powering our Economy and the World with Clean Energy*.



Blaine Higgs
Premier



Hon. Mike Holland
Minister of Natural Resources and Energy Development

Executive Summary



New Brunswick depends on energy and the future of New Brunswick's economy depends on our energy transition.



Demand for energy is increasing in New Brunswick due to economic development, electrification and a growing population. The need for reliable, low-emission energy is rising in New Brunswick, in Canada and around the globe. As world economies move to decarbonize while maintaining growth, New Brunswick is positioning itself to be a leader in the energy transition.

Our province is growing. Each year, more people from across Canada and around the world are choosing to make New Brunswick their home. Our growing businesses and industrial expansion will mean a stronger economy for all New Brunswickers. Collectively, this growth will result in a near doubling in our use of electricity. Balancing our climate, energy and affordability needs will require additional renewable and baseload energy as well as development of new energy carriers and sources such as hydrogen and biofuels.

Seizing the opportunities of a growing province and the decarbonization of our economy requires a shift in how we use and produce energy. We will reduce or phase out our use of fossil fuels such as heating oil and coal and reduce our use of gasoline and diesel in favour of low-emitting sources such as biofuels, hydrogen and renewable natural gas. Increasingly, we will depend on clean electricity from wind, sunlight, water and nuclear energy to light and heat our homes, fuel our vehicles, grow our businesses and power our industries.

Powering our Economy and the World with Clean Energy – Our Path Forward to 2035 outlines a 12-year energy roadmap and supporting strategies for how the energy landscape will transition in New Brunswick and how we will achieve our energy reliability, sustainability and affordability goals. New

Brunswick's energy strategy will continue the province's strong legacy of leadership and adaptation, this time towards a low-carbon economy and cleaner environment. This document is the first step in that strategy, outlining the actions and requirements to achieve New Brunswick's 2035 energy and climate goals which set the foundation for achieving the 2050 net-zero goals.

New Brunswick's energy vision is to be a leader in the clean energy transition by leveraging our assets, location and natural resources to develop lower carbon energy solutions for provincial, regional and global use; developing hydrogen infrastructure in combination with sources of clean energy to build and attract new business; implementing SMRs as safe and reliable non-intermittent low-carbon generation; building new clean energy supply chains; growing economic partnerships with First Nations communities; and achieving energy security and net-zero.

In this document, we identify New Brunswick's energy vision and provide a strategy to achieve that vision. We identify how the energy landscape and energy mix will change and the major developments that are required to support achieving a decarbonized electricity grid. We identify the opportunities and benefits to New Brunswick that can be realized through the energy transition strategy. Finally, we present the roadmap actions for New Brunswick to achieve the benefits of net-zero by 2050.

New Brunswick's energy transition strategy illuminates the path towards a bright, prosperous and clean powered future for our province through the development of a conscientious and made-in-New Brunswick energy strategy.

Energy Transition Highlights

The Government of New Brunswick wants all New Brunswickers to know about the energy transition strategy:

ENERGY DEMAND AND CONSUMPTION



Escalation of energy demand

Population growth, industrial expansion and a shift toward low-emission energy sources will fuel a surge in energy requirements



Electrification for decarbonization

Electrification of GHG emitting energy sources such as vehicles, industrial processes and heating will be critical in helping New Brunswick reduce our GHG emissions.



Conservation and customer choice

Energy conservation efforts will accelerate and tools will be implemented to allow customers to make more informed decisions regarding their energy use.

ENERGY SUPPLY CHANGE HIGHLIGHTS



SMRs: Double our carbon-free nuclear baseload generation by adding 600 MW of Small Modular Reactors at Point Lepreau Nuclear Generation Station by 2035.



Renewables: Increase wind and solar capacity by almost 5x by adding 1400 MW of new wind power, 200 MW of grid scale solar power, and 300 MW of behind the meter solar.



New energy: Hydrogen, renewable natural gas, and biofuels will have increased roles in our future energy blend with traditional natural gas serving as a vital transition fuel both locally and globally.



Transmission integration: Transmission upgrades and enhanced connectivity within Atlantic Canada will play an increasingly important role in balancing the grid.



Changes to vehicle fueling: Adding electric vehicle (EV) charging stations and increasing use of biofuels and hydrogen will change how New Brunswickers power their choice of vehicles.

GOVERNMENT COMMITMENTS

Government commitments will be focused on four major strategic initiatives for the New Brunswick energy transition:



Affordability

Our government is committed to ensuring energy costs are affordable and competitive for all New Brunswickers.



Energy security and reliability

New Brunswick must have a secure supply of energy that supports our climate change and growth agenda while maintaining a supply of reliable, clean electricity.



Economic growth

Our new energy ecosystem should power our economy and be a driving force for growth and prosperity in the province.



Regulatory reform

Our goal is to ensure our province is competitive, responsive and viewed as the place of choice to conduct business.



CHAPTER 01

New Brunswick Today

New Brunswick Today

OUR ENERGY VISION

Our province's goal is to become a Canadian leader in the clean energy transition. We have a generational opportunity to use our capabilities, knowledge, resources, and location to develop energy and drive decarbonization both at home and abroad. The speed and tenacity with which we approach this work will have transformative and lasting economic impacts.

We launched a new energy vision in early 2023 to help guide our collective efforts - **Powering our Economy and the World with Clean Energy.**

Our new energy vision is founded on six key principles:

01

Leverage our unique assets, location and natural resources to develop lower carbon energy solutions for provincial, regional and global use

Our province has many unique assets including Canada's largest refinery and Canada's first liquefied natural gas (LNG) terminal, and we are one of only two provinces with nuclear generation. New Brunswick's geographical location provides direct access to Europe and proximity to the United States eastern seaboard makes us an ideal energy gateway to the United States and other international markets.

New Brunswick is rich in natural resources including wind, minerals, water, forests and natural gas. This provides us with an opportunity to develop new clean energy sources and supply international partners with lower carbon transition fuels to displace higher GHG emitting fossil fuels such as coal.

02

Develop hydrogen and other sources of clean energy to build and attract new business

Alternative fuels will be a significant focus of New Brunswick's energy transition. Clean fuels like hydrogen, renewable natural gas and biofuels will play a bigger role in our future energy mix. New Brunswick intends to create an environment to incubate and develop these new energy sources to address both climate change and new economic growth opportunities.

The first new opportunities for hydrogen may be export markets while renewable natural gas and biofuels can be directly blended or substituted for fossil fuels. Domestic adoption will continue to develop as technology advances and usage increases. These new fuels are key elements of New Brunswick's energy transition as we grow our economy, attract new businesses and reduce our GHG emissions.

03

Implement SMRs as safe and reliable non-intermittent low carbon generation

New Brunswick has been one of the Canadian leaders in nuclear energy for over four decades and the expansion of non-emitting baseload nuclear generation is a fundamental part of our energy mix and path forward to net-zero.

As a member of the Pan-Canadian SMR Plan, New Brunswick has taken a leadership position in the development of Generation IV SMR technology. We plan to have our first SMR in operation by 2030 at the Point Lepreau Generating Station.

This new flexible nuclear generation technology complements our planned additions of intermittent renewables like wind and solar and can be used as an energy source for industrial decarbonization and the production of hydrogen.

04

Build new clean energy supply chains

Taking advantage of the new energy markets to grow our economy is vital. New Brunswick will grow and further develop the supply chains in our province to leverage and expand our current capabilities.

New Brunswick's diverse energy ecosystem includes developers, manufacturers, knowledge-based industry, academia and research and development which, working collaboratively, represent a significant opportunity to create jobs here at home and grow our gross domestic product (GDP).

05

Grow economic partnerships with First Nations communities

Energy development offers a transformational economic opportunity for First Nations Communities to support and partner in the energy sector projects. First Nations play a vital role in providing valuable perspectives, insights and input as new sources of energy are developed. New Brunswick will work collaboratively with First Nations communities on new energy development projects to support their active participation.

As specific energy development projects are identified, the province commits to fulfilling the duty to consult with First Nations Communities when potential adverse impacts to rights are identified.

06

Achieve both energy security and net-zero

Our climate change action plan includes a government commitment to reach net-zero GHG emissions by 2050 and develop a net-zero blueprint for release in 2025. The blueprint will include pathways to achieving net-zero.

It is essential we continue to focus on both a secure energy supply and affordability when developing diverse energy sources and technologies that meet the clean energy needs and demands of users across the province.

1.1 NEW BRUNSWICK'S CLIMATE CHANGE AND ENERGY SECURITY

New Brunswick has a proven track record of taking action to address climate change and to transform the ways in which energy is used in the province. These actions have enabled New Brunswick to lower GHG emissions and to make significant progress on our pathway of achieving a low carbon economy.

To further our progress on this critical journey, New Brunswick's vision of "Powering our Economy and the World with Clean Energy" enables us to work on strategies to begin moving our province progressively forward in this energy environment.

With change comes challenges but change also presents many opportunities. By building the required infrastructure and capacity, and offering the right programs required for the continued clean energy transition in New Brunswick, opportunities will be available with new industry and new job creation. At the same time, we will also ensure a secure supply of energy is available in our province. All New Brunswickers will benefit from a cleaner environment, both now and in future generations.

Although we have reduced GHGs more than any other province in the country since 2005, New Brunswick has an energy intensive economy that requires a tailored clean energy strategy to meet the 2035 goals and also help us reach our 2050 net-zero target. Three critical constraints of sustainability, affordability and reliability will guide the development of a New Brunswick energy transition strategy and detailed action planning.

This document provides a roadmap for New Brunswick's energy strategy development. In the following sections, the current state of energy in New Brunswick, including the current decarbonization efforts, are reviewed including the regulations and programs that support decarbonization and the energy transition. Over the next 12 years, as we work toward our 2035 goals, we will enable the development of clean energy sources and infrastructure that will set the foundation for achieving our net-zero commitment by 2050.

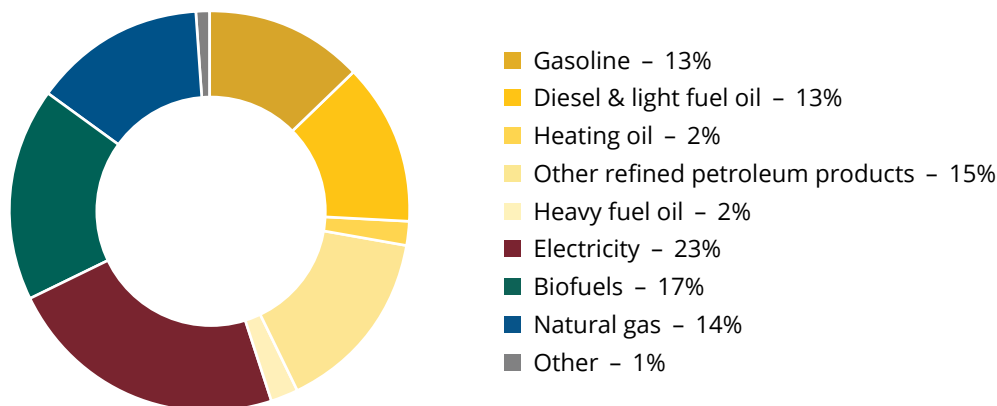
1.2 CURRENT ENERGY MIX

HOW NEW BRUNSWICK IS POWERED TODAY

Energy is the driving force behind our daily lives for heating and cooling our homes, cooking our meals, commuting and manufacturing the goods and services we use. Electricity illuminates our streetlights and turns on our devices. Various types of energy (e.g., electricity and natural gas) are used to manufacture everything from forestry products to beverages and to heat our homes, while fuel from gas stations allow us to travel and so much more.

New Brunswick's energy sources include electricity, petroleum products, natural gas, coal and biofuels (includes biomass, biogas, renewable natural gas and ethanol blended into gasoline). In 2022, 23 per cent of the energy used in New Brunswick was supplied by electricity and 17 per cent was comprised of biofuels. Most of the remaining 60 per cent of energy was supplied through petroleum products, natural gas and other GHG emitting fuels. In this section, we discuss types of energy in more detail and how and where the energy is used. Data in this section is from the Canada Energy Regulator Canada Net-Zero 2022 dataset.

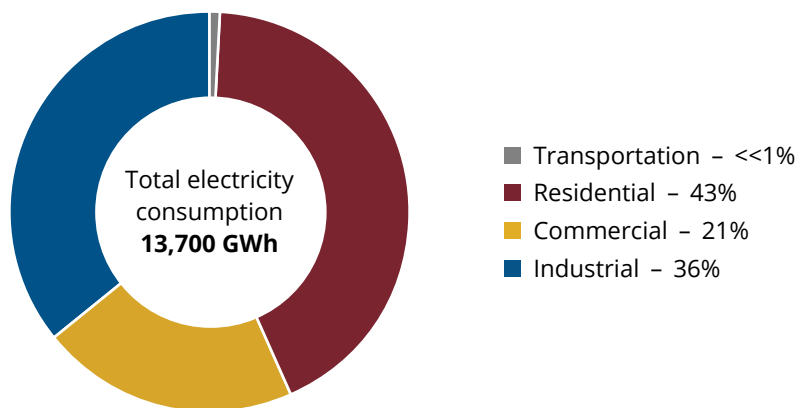
FIGURE 1.1 OVERALL ENERGY END USE CONSUMPTION IN NEW BRUNSWICK FROM ALL SOURCES



ELECTRICITY

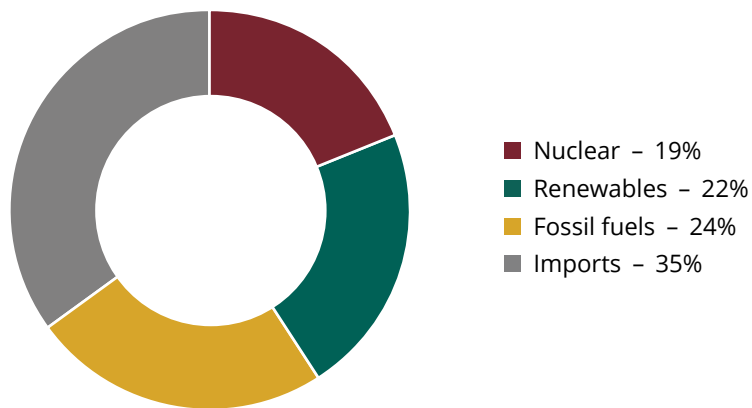
Electricity use in New Brunswick in 2022 can be divided into four major segments: 36 per cent of consumption is in the industrial segment, 21 per cent in commercial, 43 per cent of the province's electricity in the residential sector and the amount consumed in the transportation sector is currently quite small (see Figure 1.2).

FIGURE 1.2 ELECTRICITY CONSUMPTION ACROSS SECTORS IN NEW BRUNSWICK

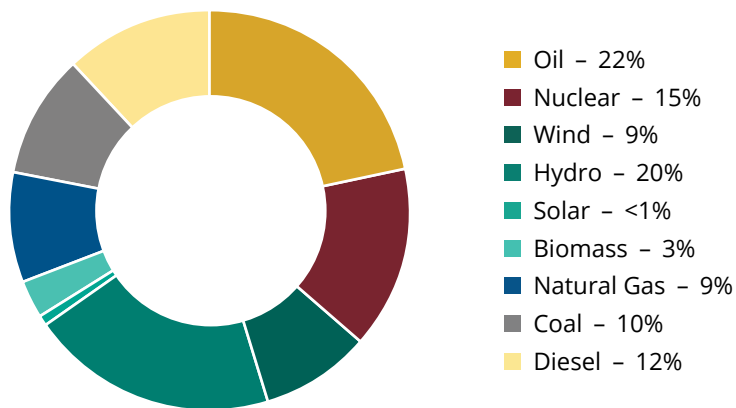
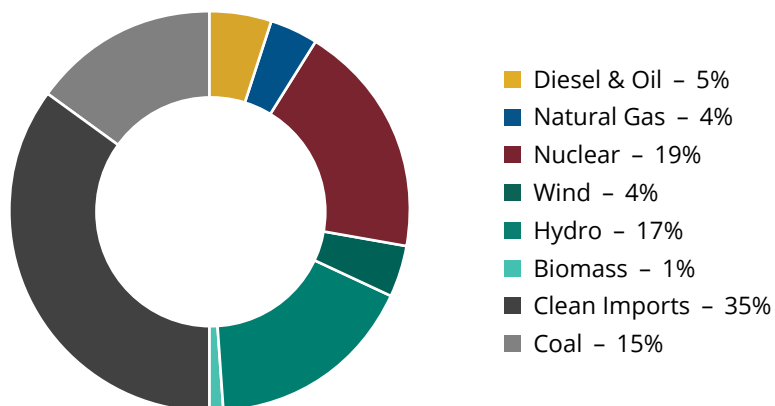


New Brunswick has a diverse mix of electricity-generating stations that produce electricity from sources such as nuclear, solar, wind, hydro, biofuels and fossil fuels (natural gas, diesel, coal and oil). Based on demand and economics, New Brunswick also imports and exports electricity to and from neighbouring provinces or states.

In 2022, electricity in New Brunswick was generated by the sources identified in Figure 1.3. Diversification of electricity sources is important to ensure there is a dependable energy supply while increasing clean electricity generation is vital to reducing GHG emissions.

FIGURE 1.3 ELECTRICITY GENERATION BY SOURCE IN NEW BRUNSWICK

The breakout of electricity generation capacity for New Brunswick is shown in Figure 1.4 and actual electricity supply by source in Figure 1.5. Note that capacity means the total ability of a generator to produce electricity.

FIGURE 1.4 ELECTRICITY GENERATION INSTALLED CAPACITY BY SOURCE IN NEW BRUNSWICK IN 2022**FIGURE 1.5: ACTUAL ELECTRICITY SUPPLY BY SOURCE IN NEW BRUNSWICK IN 2022**

The following section summarizes electricity generation in New Brunswick:



Nuclear

Our province currently has a total electricity generation installed capacity of 663 MW from nuclear energy. New Brunswick has been a nuclear leader in Canada since 1982. For decades, the Point Lepreau Generating Station has provided New Brunswickers with stable and emission-free electricity and it is expected to continue to safely run for decades into the future, pending license renewals every 10 years. Nuclear energy is one of the key energy sources in New Brunswick's electricity system and it will continue to be an important source of safe, stable and clean electricity in the province.



Solar

At present, New Brunswick has a total solar electricity installed capacity of 8 MW, with most of the current solar installation being used for residential purposes. The growth of the solar generation capacity will play a role in the diversification and decarbonization of our electricity system in the future.



Wind

Currently, New Brunswick has a combined installed capacity of 397 MW of electricity generated from wind energy installed at numerous locations in the province. Wind farms in our province include the Kent Hills Wind Farm, Caribou Wind Park, Laméque Wind Farm, Wisokolamson Energy Project, Wocawson Energy Project, Oinpegitjoig (Richibucto) Wind Project, Burchill Wind Farm, and Cap-Pelé Wind Project. New Brunswick has exceptional wind resources for both onshore and offshore with a total estimated capacity of 20,000 MW. The installed capacity of wind generation in New Brunswick will ultimately increase and will be important in the province's future energy generation mix.



Hydro

Our province boasts 889 MW of generating capacity from hydro energy across seven dams in the province, namely Mactaquac, Beechwood, Grand Falls, Tobique, Nepisiguit Falls, Sisson and Milltown. The Mactaquac facility is the largest hydro generation station in the Maritime provinces. Hydro energy is currently one of the key energy sources in New Brunswick's electricity system.



Biomass

New Brunswick has 119 MW of installed generating capacity from biomass. The increased development and adoption of biomass and new forms of biofuels will represent an opportunity as an alternative fuel for energy generation.



Fossil Fuels

New Brunswick has a total electricity installed capacity of 2344 MW generated from fossil fuels, which includes coal, natural gas, diesel and oil:

- The only active coal-fired facility in the province is Belledune Generating Station which is one of the province's largest electricity generating facilities.
- The natural gas facilities in the province are the Grandview Cogeneration and Bayside Generating station.
- The diesel facilities in the province include Grand Manan Generating Station, Millbank combustion turbines and Sainte-Rose combustion turbines.
- The fuel oil facility is the Coleson Cove Generating Station (normally used only for generation during high peak power demand periods).

It is worth noting that the Government of New Brunswick has committed to phase out coal in the latest climate change action plan, as required by the federal government. Phasing out coal will reduce emissions significantly from New Brunswick's electricity supply. This is discussed further in Chapter 2 of the document.



Battery Energy Storage

In addition to the energy storage provided by the Mactaquac dam, batteries allow excess energy that has been generated to be stored and then provided to the electricity grid when it is needed, often at a time of peak electricity demand or when output from wind and solar generation is low due to weather conditions. In early 2023, NB Power issued a procurement for 50 MW of new battery energy storage and Saint John Energy procured 7 MW of battery storage.

NON-ELECTRICITY ENERGY SOURCES

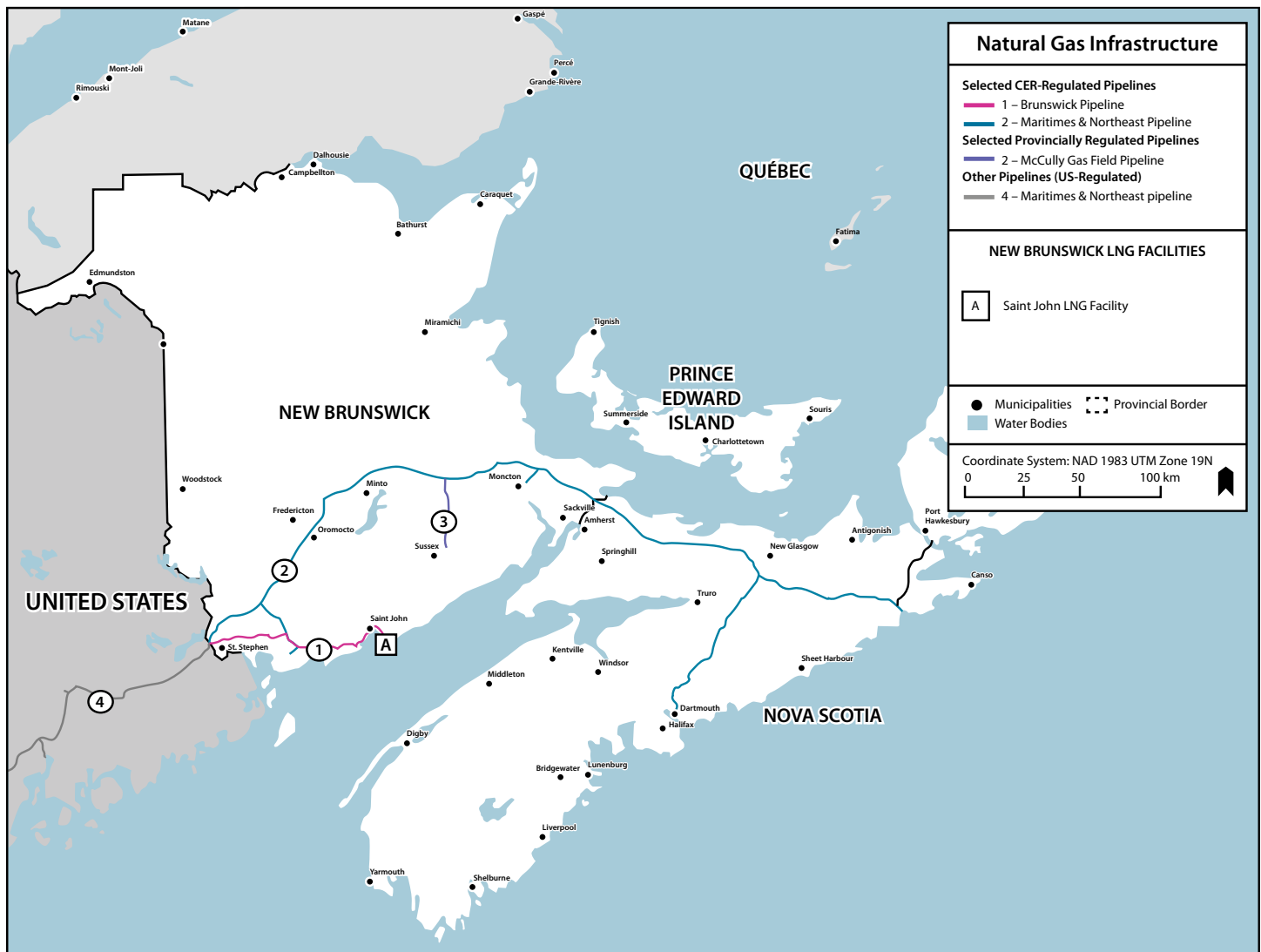


Natural Gas

Natural gas is used in New Brunswick for energy generation, industrial and commercial operations and some home heating. Of the almost 30 billion cubic feet consumed annually, essentially all the natural gas used in New Brunswick is imported into the province. Natural gas is imported into our province through the Maritimes and Northeast Pipelines as shown in Figure 1.6. LNG is also imported through the Repsol LNG Terminal in Saint John.

While our province is home to vast natural gas reserves of 77 trillion cubic feet of natural gas, currently only 1.6 billion cubic feet per year is produced in our province in the McCully Field near Sussex. This local natural gas production has been ongoing since 2007. New Brunswick's undeveloped natural gas resources and our advantageous location provide an opportunity for the province to supply all of Atlantic Canada with natural gas, in addition to shipping LNG to Europe as a transition fuel source to offset higher-emission energy sources.

FIGURE 1.6 NEW BRUNSWICK NATURAL GAS PIPELINE SUPPLY CONNECTIONS



Map produced by the CER, February 2022. The map is a graphical representation intended for general information purposes only.



Oil and Other Petroleum Products

New Brunswick is home to the largest refinery in Canada where crude is imported by ship and at times by rail and converted into refined petroleum products such as gasoline, diesel, propane and aviation fuels. Petroleum products are used in New Brunswick for transportation and home heating in addition to the electrical energy generation described earlier. These petroleum products are delivered to consumers through service stations, terminals, pipelines and truck delivery. New Brunswick only produces small amounts of crude oil.



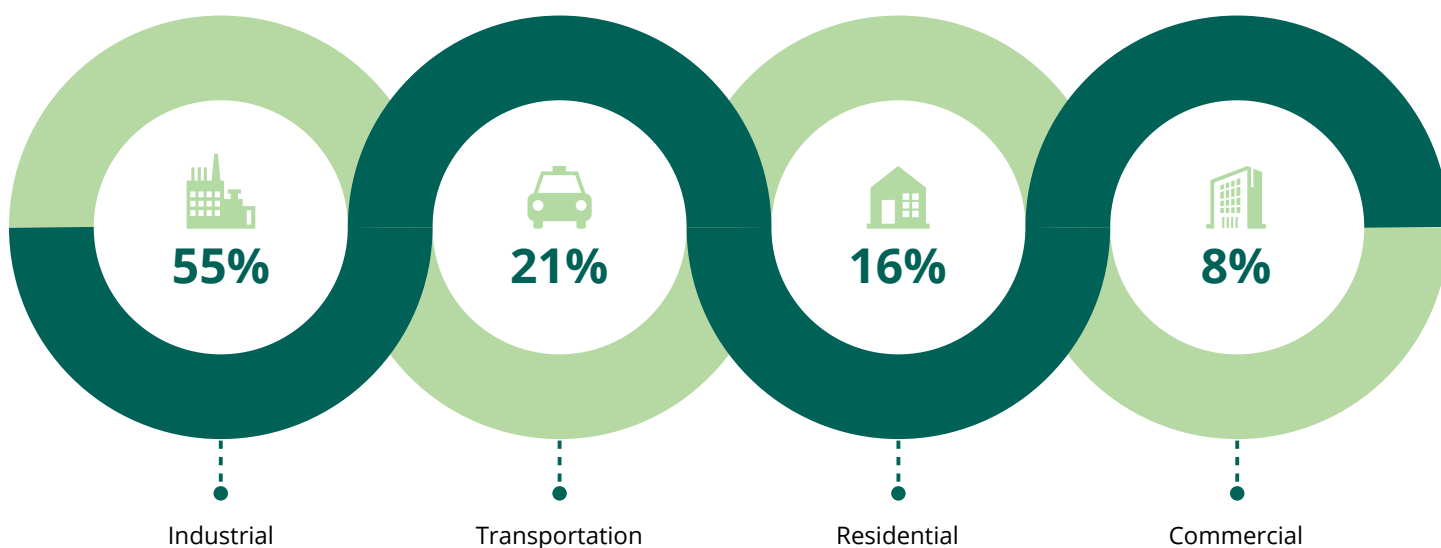
Renewable Natural Gas

Much like biofuels for transportation, renewable natural gas is a form of natural gas that can be substituted for traditional natural gas without the need for new equipment or infrastructure. It is produced by capturing and digesting the biogas released from decaying material such as landfill waste, biosolids from water treatment, organic waste from food processing and agriculture waste. Renewable natural gas is already being produced at the regional waste management facilities near Moncton, Fredericton, and Saint John. In the climate change action plan, our government committed to enabling the local production and use of renewable natural gas through targets in the natural gas sector and the building of enabling infrastructure.

HOW ENERGY CURRENTLY AFFECTS LIFE IN NEW BRUNSWICK

It is crucial that New Brunswick's energy transition occurs in a way that ensures the reliability and affordability of energy whenever and wherever it is needed. The network of energy sources that has developed in New Brunswick over the years has been informed by demand, security, affordability and reliability. As we take steps to increase sustainability and reduce emissions in the province, these considerations remain essential in planning the first major energy transition in over 100 years.

FIGURE 1.7 NEW BRUNSWICK SECTOR ENERGY CONSUMPTION

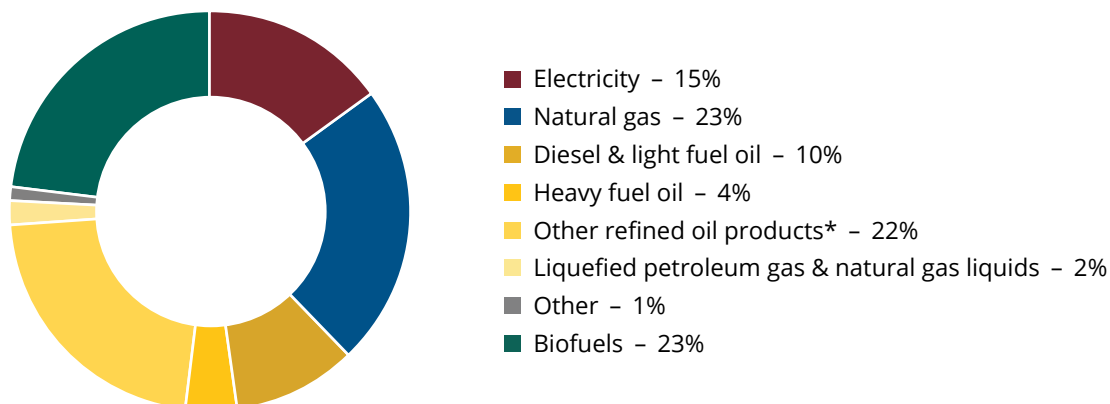




Industrial Uses of Energy

Approximately 55 per cent of the total energy use in New Brunswick is attributed to the industrial sector. New Brunswick's economy is diverse with fishing, food processing, beverage production, refining, mining, forestry and agriculture all contributing to our economic strength. A critical part of new economic development will be the availability of competitive, reliable and clean energy sources.

FIGURE 1.8 INDUSTRIAL ENERGY SOURCES IN NEW BRUNSWICK



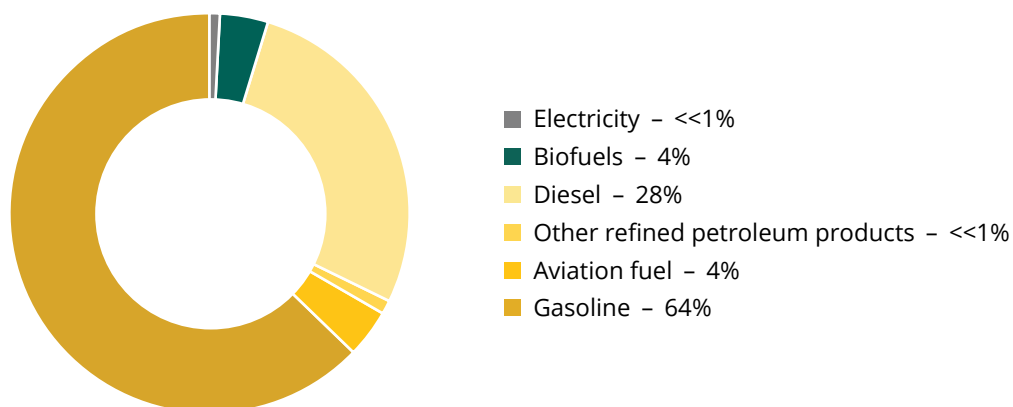
* Note: Other refined oil products refers to refinery by-products typically used for industrial applications



Transportation Uses of Energy

Energy for the transportation sector accounts for approximately 21 per cent of the total energy use in New Brunswick. We depend on various transportation modes including buses, cars, trucks, trains, ships and aircraft for our everyday lives and to transport various products. Most transportation energy consumed today is gasoline or diesel but the transition to EVs has begun. Light duty vehicles comprise the majority of EVs currently in use today.

FIGURE 1.9 TRANSPORTATION ENERGY CONSUMPTION IN NEW BRUNSWICK

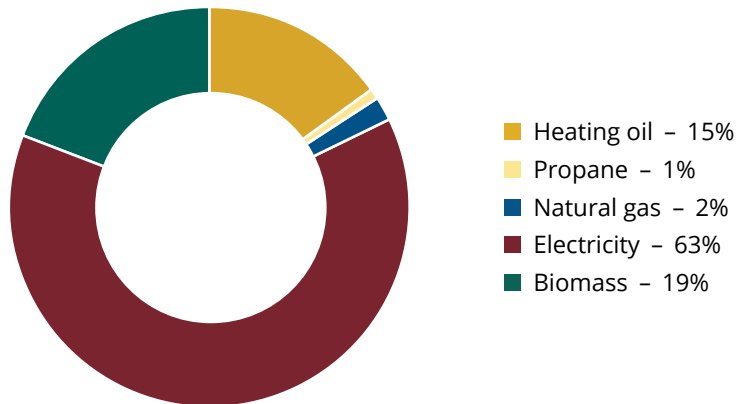




Residential Uses of Energy

The residential sector accounts for about 16 per cent of the total energy use in New Brunswick. We depend on energy for our household activities such as lighting, appliances, hot water and heating and cooling. Our major energy sources for residential use are electricity, biomass, propane, heating oil and natural gas. Reliable and affordable energy is essential in our daily routines and to our standard of living.

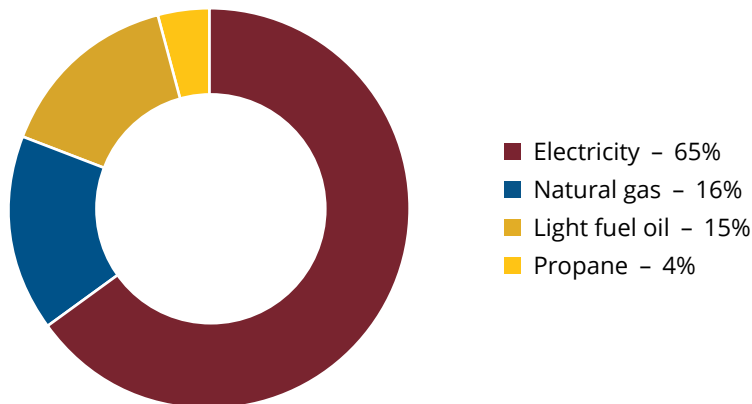
FIGURE 1.10 RESIDENTIAL ENERGY CONSUMPTION IN NEW BRUNSWICK



Commercial Uses of Energy

The commercial sector represents eight percent of New Brunswick's total energy use. Included in the commercial sector are facilities such as commercial and retail businesses, hospitals, government facilities and schools. As shown in the figure below, electricity is the major source of energy in this sector.

FIGURE 1.11 COMMERCIAL ENERGY CONSUMPTION IN NEW BRUNSWICK



1.3 DRIVERS OF CHANGE

The global, national and provincial energy transition is being driven by the goal of reducing GHG emissions and limiting the impact of climate change. This transition has the power to unlock significant economic opportunities as new industries begin to develop or relocate to our province. The pace and scope of change is more significant than anything observed since the industrial revolution. In addition to emissions reductions, the energy transition must support sustainable, affordable and reliable energy for all New Brunswickers. Efforts globally, as well as in our province, are underway to achieve lower carbon emissions through the use of renewable energy sources. Drivers for this transition include reaction to climate change, economic development demands, customer preferences and federal requirements.

CLIMATE CHANGE

Climate change is a long-term shift in the average weather and temperature patterns. It is the most difficult challenge that the world faces today. There are growing concerns about the use of fossil fuels for energy generation and their impact on GHG emissions. According to *New Brunswick's Climate Change Action Plan 2022 – 2027* and the National Adaptation Strategy, New Brunswickers are already experiencing the effects of climate change including more extreme precipitation events, rising sea levels, extreme storms, record-setting flooding and heat waves.

ECONOMIC DEVELOPMENT

New Brunswick's economy is performing well and is poised for continued growth. Since 2020, New Brunswick has experienced positive momentum with respect to GDP, population and employment growth.

- **GDP** – GDP growth is a measure of the value-added activity to produce goods and services. GDP growth is an important indicator of overall economic health. In 2022, New Brunswick experienced a 1.8 per cent year-over-year increase in GDP. Provincial and federal spending continued investment in building construction and growing activity in the tourism sector have all been contributing factors in New Brunswick's GDP growth.
- **Population growth** – Population growth has been unprecedented in New Brunswick and has been driven by international and inter-provincial migration. In 2022, New Brunswick experienced a 4.7 per cent increase in population. Given the increase in the number of people moving into the province, residential building activity has accelerated, which has contributed to increased economic activity. As the population increases, so does the demand for energy.
- **Employment** – Employment in New Brunswick has grown in tandem with the strong population growth. In fact, full time employment growth in New Brunswick led the country over the January to July 2023 period. By aligning population growth initiatives to private sector needs, New Brunswick is enabling further economic growth.

With the growth of GDP, population, and employment in New Brunswick, energy demand is also increasing. To meet this increasing demand and the climate change commitments made by the Government of New Brunswick, we need to explore opportunities to use clean and renewable resources for energy and transform New Brunswick to a low carbon economy.

CUSTOMER PREFERENCES

Considerations including climate change, population growth, societal needs, economic opportunity and personal values have caused a shift in customer attitudes toward cleaner energy and electrification. In addition, there is growing preference among businesses for environmental, social and governance initiatives which motivate clients to pursue cleaner energy options. Both technology changes and customer demands are driving change.

Customers' expectations for cost-effective clean energy supply, transition to low emission vehicles and electrification are continuously evolving. In response to climate change commitments and customer preferences, businesses and utilities are addressing the shifting and growing demand. Customers' expectations for cost-effective clean energy supply, transition to low emission vehicles and electrification are continuously evolving. In response to climate change commitments and customer preferences, businesses and utilities are addressing the shifting and growing demand.

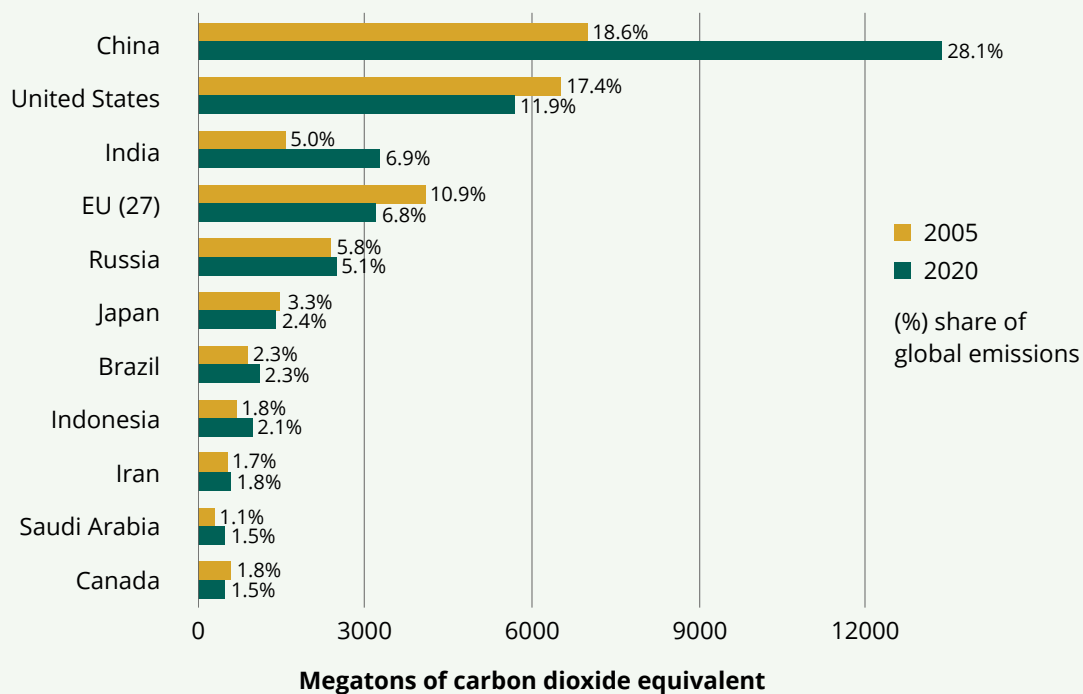
FEDERAL REQUIREMENTS

The federal government has implemented a range of policy measures that are actively shaping New Brunswick's energy transition. These measures involve:

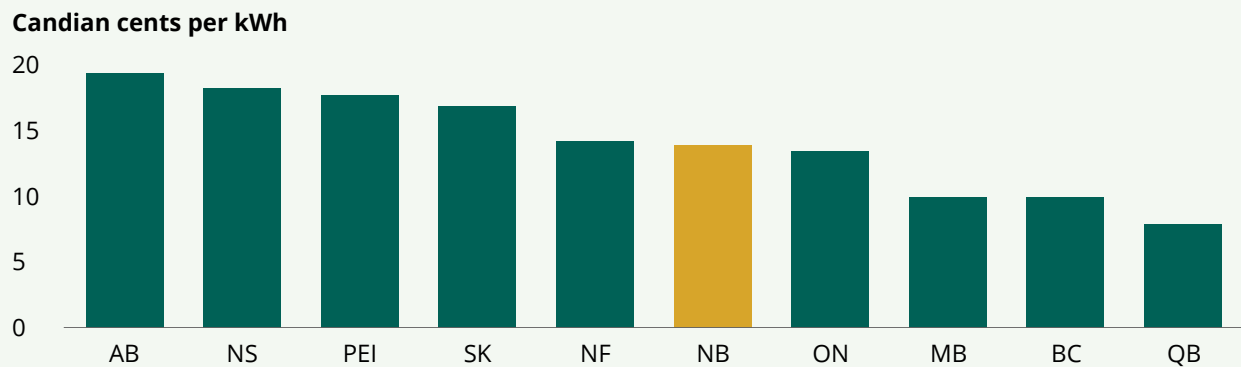
- Changes to energy sources including the federal coal phase-out, the Clean Fuel Regulations, and the proposed Clean Electricity Regulations.
- Establishing standards for products like Canada's Energy Efficiency Regulations.
- Setting limits on GHG emissions such as Canada's Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds.
- Carbon pricing, which places a price on carbon to incentivize low emission technologies, activities, and fuels.

New Brunswick has already reduced greenhouse gas emissions since 2005 by almost 40 per cent which is more than any other province in the country. New Brunswick's energy supply is approximately 80 per cent clean electricity. However, the new federal Clean Electricity Regulations require a clean grid by 2035, which is 15 years ahead of the global net zero target of 2050.

New Brunswick is committed to taking action to reduce climate change and the government has demonstrated this commitment through our comprehensive Climate Change Action Plan. It is important to consider our GHG emissions in New Brunswick in the context of our Canadian emissions and globally. New Brunswick is a very small contributor to Canada's emissions representing approximately 1.8 per cent of our national GHG emissions according to the latest Environment and Climate Change Canada data (2021). Globally, Canada contributes only 1.5 per cent to the world's emissions according to the Environment Climate Change Canada data (2020).

FIGURE 1.12 GREENHOUSE GAS EMISSIONS FROM CANADA AND THE TOP 10 EMITTING COUNTRIES AND REGIONS

New Brunswick has very competitive electricity rates as shown in Figure 1.13. These new regulations and resulting changes will increase electricity costs by up to 30 per cent by 2035 without any actions to help offset these costs through efficiency programs or barring further changes in federal regulations. Unmitigated, rising energy costs would have a significant impact on our residents and economy.

FIGURE 1.13: PROVINCIAL RESIDENTIAL ELECTRICITY RATE COMPARISON

WHAT OUR ENERGY TRANSITION STRATEGY NEEDS TO CONSIDER

Sustainability, affordability and reliability will shape the development of New Brunswick's energy transition strategy and detailed action planning. We must maintain New Brunswick's current capabilities without compromising the energy needs or impacting climate change for our future generations. Affordability is crucial; everyone in New Brunswick should be capable of paying for their energy needs and basic living expenses without feeling overburdened. Lastly, we must guarantee the integrity and effectiveness of operations across all economic sectors with reliable energy.

New Brunswick is very well-positioned to support our energy transition: the province has an abundance of renewable and transition resources such as wind, natural gas and critical minerals, our location provides us with a significant advantage for import and export of goods and energy related products, and we have a very skilled and adaptable workforce. These advantages mean that while New Brunswick navigates the details of energy transition and affordability, there are also significant opportunities to develop the economy with new products and exports that other provinces and countries will require for their energy transition.

1.4 CURRENT GOVERNMENT OF NEW BRUNSWICK INITIATIVES

New Brunswick's climate change action plan, along with federal government regulations, provides clear objectives for energy transition. The New Brunswick government has allocated a budget for the development and delivery of energy efficiency and conservation programs to support New Brunswick's transition to a low-carbon economy. This section outlines current plans, regulations and initiatives to support and incentivize New Brunswick's energy transition.

The following are initiatives that are currently in place to help with the low-carbon economy transition in New Brunswick:

PLANS

Plans currently in place related to energy transition include specific actions, commitments and key performance indicators.

- *Our Pathway Towards Decarbonization and Climate Resilience: New Brunswick's Climate Change Action Plan 2022 – 2027 (Climate Change Action Plan)*

The New Brunswick government set out detailed actions and programs to reach the province's decarbonization goals. The objective of the plan is to achieve the New Brunswick 2030 GHG reduction target which will help New Brunswick reach net zero by 2050. New Brunswick's net-zero blueprint will be developed by 2025.

The 30 climate change government commitments outlined in this plan are categorized in three pillars including:

- (1) Government leadership and accountability
- (2) Reducing GHG emissions, and
- (3) Preparing for climate change.

The plan includes action types related to education and capacity-building, collaboration with First Nation communities, transforming how people and goods move around the province, clean energy and energy efficiency, reducing waste and turning it into a renewable resource, supporting low-carbon agriculture, understanding the value of carbon sinks, greening government, building low-carbon communities, growing sustainable economic opportunities and adaptation planning and implementation. Additional action items for continued efforts are summarized in the plan (see the Target and Incentives sections below for a few examples).

- *2023 Integrated Resource Plan (IRP): Pathways to a Net-Zero Electricity System*

In this document, NB Power has outlined the long-term objectives for New Brunswick's electricity supply and demand. The plan was prepared with a focus on reducing NB Power's GHG emissions and achieving a net-zero electricity system by 2035. In Chapter 2 we refer extensively to the IRP since the reduction of GHG emissions depends, to a large extent, on electrification and clean electricity.

STANDARDS AND REGULATIONS

New Brunswick has adopted or is planning to comply with various federal government standards and regulations that aim to achieve Canada's *2030 Emissions Reduction Plan*.

- Coal phase-out: Federal government requirement to transition off coal-fired electricity by 2030 (Part of action no. 7 in appendix A of the climate change action plan).
- Federal Energy Efficiency Regulations: Federal government regulations establish standards for products to be imported into Canada or shipped from one place to another for the purpose of sale or lease. All regulated products must meet federal energy efficiency standards. These include meeting energy efficiency standards for appliances, heating and cooling equipment.
- New Brunswick Energy Efficiency Regulation under the *Electricity Act* is the provincial regulation that establishes an escalating series of electricity efficiency targets for in-province electricity sales from 2023 to 2029 along with escalating funding to support non-electric and social programs.
- Methane regulations: Federal and provincial regulations for methane, including federal regulations for the oil and gas production sector, target reducing emissions by 40 per cent of 2012 levels by 2025.
- Clean fuel regulations: Performance-based supply standard requiring suppliers of gasoline and diesel to reduce the lifecycle carbon intensity of their fuels.
- Renewable fuels: The federal government's Renewable Fuel Regulations require fuel producers and importers to have an average renewable fuel content of at least five per cent based on the volume of gasoline that they produce or import into Canada and of at least two per cent based on the volume of diesel fuel and heating distillate oil that they produce or import into Canada. These regulations will be repealed by the Clean Fuel Regulations on September 30, 2024, but the new regulations will retain the Renewable Fuel Regulation's volumetric requirements.
- Clean Electricity Regulations (draft): New Brunswick, through NB Power, have developed the IRP to meet the stated goal of a net-zero electricity grid by 2035. This is part of the energy transition strategy discussed in more detail in Chapter 2.
- Carbon pricing: To accelerate Canada's efforts toward having a low-carbon economy, the federal government introduced stricter national standards by increasing carbon tax annually at a rate of C\$15 per tonne between 2023 and 2030 growing to \$170/tonne by 2030. The Government of New Brunswick opted to adopt the federal backstop for carbon taxation.

INCENTIVES

The Government of New Brunswick is supporting the use of federal incentives and has developed provincial incentives to advance energy transition projects.

- Investment tax credit for Carbon Capture, Utilization, and Storage (CCUS): Federal investment tax credit for CCUS projects that permanently store captured carbon dioxide (CO₂) in geological storage or in concrete. Note that the following federal tax credits outlined in budget 2023 will support investments in a made-in-Canada clean economy:
 - Fifteen per cent refundable Clean Electricity Investment Tax Credit: For eligible investments in technologies that are needed for the generation and storage of clean electricity and its transmission between provinces and territories, which is available to taxable and tax-exempt entities.
 - Refundable Clean Technology Manufacturing Tax Credit: To cover 30 per cent of costs in new machinery and equipment used to manufacture or process clean technologies and extract, process, or recycle critical minerals.
 - Clean Hydrogen Investment Tax Credit: To support between 15 and 40 per cent of eligible project costs to produce clean hydrogen, right here at home.
 - Carbon Capture, Utilization, and Storage Investment Tax Credit: Broadening the scope of this tax credit to include additional types of equipment used to capture carbon dioxide emissions for storage or other uses in industrial processes.

- Eligibility for the refundable Clean Technology Investment Tax Credit: Broadening the scope of this tax credit to encompass ground source heat pump systems (known as geothermal energy) will provide additional support for the advancement of Canada's clean technology sector.
- Clean Technologies Investment Tax Credit: A federal investment tax credit for clean electricity generation systems, stationary electricity storage systems, clean hydrogen production projects, low-carbon heat equipment and industrial zero-emission vehicles and related infrastructure.
- Climate Change Fund: The New Brunswick government invests in climate change initiatives (Section 1.5 of *New Brunswick's Climate Change Action Plan 2022 – 2027*) including clean energy and energy efficiency initiatives, increasing the number of EVs and charging infrastructure, economic opportunities in the low-carbon economy and training and educational programming.
- Zero-emission vehicle subsidies: Federal and provincial subsidies on zero-emission vehicles. As part of the Government of New Brunswick's commitment to transform how people and goods move around the province, the government will continue to support the uptake of EVs in the province and the necessary charging infrastructure (Section 2.3 of *New Brunswick's Climate Change Action Plan 2022 – 2027*) around the province.

ENERGY EFFICIENCY TARGETS AND PROGRAMS

Energy efficiency is critically important to the affordability of energy for all New Brunswickers. Energy that is not used represents the most efficient generation there is. New Brunswick has been steadily increasing its investments in energy efficiency through commitments made by NB Power, as well as the provincial and federal governments. Since 2021 – 2022 when the total budget for efficiency programs was \$32.6 million, the budget has almost doubled to \$62.8 million in 2022 – 2023 and is projected to be over \$118 million in 2023 – 2024. These programs include the following:

Enhanced Energy Savings Program



WHO IT'S FOR:

Homeowners who heat with electric baseboards or heating oil with a combined household income of less than \$70,000.

WHAT'S INCLUDED:

Upgrades will be offered to homes in need of energy efficiency upgrades, especially those needing insulation and air sealing. These free upgrades will help New Brunswick homeowners reduce their energy use and costs.

Total Home Energy Savings Program



WHO IT'S FOR:

All homeowners.

WHAT'S INCLUDED:

Homeowner starts with a \$99 home energy evaluation to get clear, measurable ways to save energy. Then, the homeowner will receive up to thousands of dollars in incentives when they make any, or all, of the recommended energy-saving upgrades. Reimbursements paid to the homeowner upon completion of upgrades to insulation, air sealing, windows, doors, heating systems, renewables and water heating.

New Home Construction Program



WHO IT'S FOR:

Builders or people having homes built.

WHAT'S INCLUDED:

Get building plans evaluated and earn up to \$15,000 in reimbursements for building a home beyond the minimum building envelope requirements (National Building Code). Flexible performance or prescriptive paths for builders and homeowners.

Business Rebate Program



WHO IT'S FOR:

Commercial businesses, small-medium industrial facilities, and buildings (includes apartments, churches and ice rinks).

WHAT'S INCLUDED:

The program offers 25 percent back on energy efficient products and equipment for business; from lighting to heating, cooling and ventilation, to commercial kitchen equipment, and more. Fuel savings measures were introduced September 2023 for trucking companies wishing to reduce their fuel costs. Free Energy Walkthroughs available.

Commercial Buildings Retrofit Program



WHO IT'S FOR:

Commercial buildings (includes municipal and academia).

WHAT'S INCLUDED:

Get up to 100 per cent back on the costs of an energy audit or feasibility study after completing one or more recommended upgrades. Receive up to \$250k incentives of recommended electricity savings measures or \$1.25M on other fuels savings projects. Free Energy Walkthroughs available.

Industrial Energy Efficiency Program



WHO IT'S FOR:

All industrial facilities (includes agriculture).

WHAT'S INCLUDED:

Up to \$1.5 million in reimbursements to businesses that complete upgrades on HVAC, refrigeration, compressed air, building envelope, fuel switching, process upgrades and more. Free Energy Walkthroughs available.

New Construction Commercial and Industrial



WHO IT'S FOR:

Commercial and industrial businesses planning a new building construction or an addition to an existing building structure.

WHAT'S INCLUDED:

This program encourages the adoption of new construction practices that use less energy and lower GHG emissions. This will help the construction and design industry prepare for the low-carbon economy and the transition to net-zero energy ready construction codes.

Peak Rebate Program



WHO IT'S FOR:

Most commercial and industrial businesses.

WHAT'S INCLUDED:

This program rewards participants for making simple energy-saving changes on request. Payment to participating businesses of \$25 per kW reduced between 7 a.m. – 9 a.m. on select winter mornings.

CHAPTER 02

New Brunswick Energy Strategy



New Brunswick Energy Strategy

2.1 DRIVERS FOR INCREASED ENERGY DEMAND

Energy demand is increasing significantly. Population growth, more industrial facilities due to growing economic activity and the replacement of fossil fuels with low- or zero-emitting energy sources will increase and shift the demand in the years to come.

The following chapter explores the three main drivers for the projected increase in energy demand – population growth, economic development and decarbonization.

POPULATION GROWTH

As our provincial population grows so does the requirement for more energy to support heating, cooking, entertaining and all aspects of our daily lives. As New Brunswickers, we rely upon many forms of energy in our daily activities, and our new neighbours will require much the same to enjoy the same quality of life that we have come to expect in our province. This will mean more homes, more vehicles on the road and more customers for our local businesses.

Currently, the residential sector accounts for approximately 45 per cent of the total electricity usage in New Brunswick. By 2035, our population is expected to increase by approximately 22 per cent which will result in 948,000 people living in New Brunswick. This increase in population will be driven predominantly by international and inter-provincial migration. With ongoing population increase beyond 2035, our population is projected to reach one million by 2040. This sustained and beneficial population growth will drive demand for all forms of energy.

Coupled with this population growth, our climate change action plan, as required by federal government requirements, will result in a phase out of oil for home heating by 2030. As many of us already heat our homes with electricity, this will lead to a modest increase in residential electrical demand as new construction installs electric baseboard heaters or more efficient electric heat pumps.

INDUSTRIAL DEMAND GROWTH AND ECONOMIC DEVELOPMENT

Industrial growth will also impact the need for higher electricity supply with future increases in industrial activities. A vibrant and diversified economy creates opportunities for everyone who wants to live, work, and raise a family here in our province. Growing New Brunswick's economy and providing secure and sustainable jobs for New Brunswickers is a priority. As more people choose to make New Brunswick their home and businesses make new investments, we will need more energy to power our industries and businesses to support that growth.

As jurisdictions around the world begin to decarbonize and electrification increases, industries may be displaced and forced to relocate operations. Energy intensive industries will be most at risk and will need to ensure access to reliable and abundant sources of clean energy. New Brunswick's projected industrial demand growth factors in the establishment and relocation of new industries, critical mineral project development, and increased demand associated with production of new fuels/carriers such as hydrogen. Although not all new industrial processes will be electrified, there will be increased demand for electricity to power equipment and processes, provide heating and lighting, and ultimately produce the goods to serve domestic and international markets and grow our economy.

Currently, the industrial sector accounts for 4862 GWh, which is approximately 35 per cent of the total electricity use in New Brunswick. By 2035, demand growth from new industry is projected to increase by approximately 1000 MW. Having a secure, competitive, and clean energy supply to support our growth at home will be important for all New Brunswickers.

DECARBONIZATION OF INDUSTRY

There is a requirement to decarbonize industry by either increased electrification of processes where fossil fuels are used or through transition to new energy carriers/sources like hydrogen and natural gas blends, biofuels, or renewable natural gas as technology and availability develops. While industrial facilities and processes account for approximately 35 per cent of the total electricity demand in the province, they also account for approximately 34 per cent of New Brunswick's total GHG emissions. As a result, it is important that companies continue their work to decarbonize their operations and reduce emissions, helping us meet the provincial emission reduction targets while remaining competitive across their markets.

Electrification of industry will have a direct impact on electricity demand as we will have more equipment and processes that need electricity as they change from other forms of energy. With virtually every industrial sector affected, the province will need to systematically plan the growth in electricity generation to meet the future demand.

Hydrogen already plays a significant role in heavy industry. By using hydrogen produced by renewable power directly or through blending with other feedstock inputs such as natural gas, we can make a meaningful impact on GHG emissions from the industrial sector. This will require a significant increase of the available supply of hydrogen, particularly hydrogen created through electrolysis powered by renewable energy.

By 2035, the growth in the industrial sector as well as electrification of existing processes is expected to increase the overall requirement for electricity significantly. This will be driven by a continuous push from the provincial and federal governments to reduce emissions by focusing on using electricity to decarbonize industry while seeking opportunities through increasing efficiency, conservation, smart technology and the use of alternate energy sources across the industrial sector.

DECARBONIZATION OF TRANSPORTATION

Decarbonization of transportation will also increase demand for electricity and other replacement fuels, with an increasing number of vehicles requiring new energy sources. New Brunswickers are increasingly looking to EVs to replace their gasoline and diesel-powered vehicles. The technology is improving, more models are available on the market, and vehicles are becoming less expensive relative to traditional vehicles.

In 2022, 1.7 per cent of the vehicles sold in New Brunswick were electric, which is more than the number sold in the previous five years combined. By 2035, this number is expected to grow to as many as 235,000 electric passenger vehicles on the road according to analysis performed for the province. This will be driven by the federal government's zero-emission vehicle sales mandate which requires that 60 per cent of new vehicles sold by 2030 and 100 per cent of new vehicles sold in 2035 and onwards be zero-emissions vehicles.

It will not just be passenger vehicles that switch from gasoline and diesel. The federal government has committed to developing regulations which will mandate that 100 per cent of medium-duty and heavy-duty vehicle sales are zero-emissions by 2040. This means that fleets of cargo vehicles and public transit vehicles will also move from fuels such as gasoline and diesel to electric batteries and other clean fuels. Projects such as the Saint John Transforming Transit initiative will see diesel buses in Saint John replaced by electric buses by 2040. The City of Fredericton will replace diesel buses first with diesel-electric hybrid buses and then eliminate diesel entirely by 2050.

The electricity demand to charge our EVs will grow to 427 GWh annually in 2035 with the potential to require as much as 78 MW in the highest demand hours of the year. The province is supporting development of the necessary charging infrastructure to meet projected EV growth. This is important infrastructure which must be developed to ensure that New Brunswickers can continue to travel with confidence throughout our province.

The decarbonization of transportation will also rely on replacement fuels such as bioethanol, biodiesel and renewable diesel as drop-in replacements for existing fuels where they are currently in use today. Doing so could potentially result in reduced lifecycle GHG emissions for vehicles that switch to these fuels. In some cases, these fuels can be substituted directly without the need for any modifications to the vehicle. However, providing confidence to drivers will mean that increased sources of the key inputs for these fuels will need to be developed and made available across the province.

2.2 2035 ENERGY FOCUS

Our province depends on energy that is reliable, sustainable, and affordable. With rising global temperatures and increasingly frequent and intense climate-related weather events, there is an urgent need to adopt clean energy solutions that slow the impact of climate change. As such, New Brunswick is prioritizing the implementation of initiatives to transition away from energy sources that emit GHGs into the atmosphere. This is in line with our national effort to reduce GHG emissions as a part of Canada's commitment in the Paris Agreement to limit global temperature rise to no more than 1.5° Celsius by 2050. For our part, New Brunswick has committed to achieve net-zero GHG emissions across our economy by 2050. Energy transition and decarbonization efforts are increasingly important for the province to attract new and clean energy investment, help current industry transform, create new job opportunities and support business growth while maintaining the affordability of energy and a sustainable cost of living for New Brunswickers.

Over the coming years, New Brunswick will experience a significant shift in the way we generate and use energy in the province. Due to the influences of population growth, economic development and decarbonization of the economy, all sectors, including residential, commercial, industrial and transportation, will see significant growth in electricity use and begin a transition away from some traditional fuel sources to new sources of energy such as hydrogen, biofuels and renewable natural gas. In conjunction with the fuel changes, the province will add more clean technology to our sources of electricity to further reduce GHG emissions while maintaining reliability and affordability.

Electricity data provided in this section has been based upon modeling performed by NB Power. Unless otherwise specified, non-electrical energy and GHG emission data provided in this section has been sourced from the Canada Energy Regulator's Canada's Energy Future 2023 Canada Net-Zero data set.

AN OUTLOOK FOR NEW BRUNSWICK ENERGY IN 2035

Here is how the demand for energy will evolve across various sectors in our province in the years to come:



Industrial

- Investment attraction will be driven by New Brunswick's growing economy, our clean energy mix and ready access to both Canadian and international markets.
- New Brunswick's strong industrial sector will add an expected 1,000 MW of new facilities between 2025 and 2035.
- The electrification of existing facilities that currently depend on fossil fuels as inputs to their industrial processes will reduce emissions while increasing the demand for electricity in the sector.
- In industrial applications that cannot easily be electrified, clean hydrogen will play an important role in decarbonizing industrial energy use.
- Where appropriate, reducing the lifecycle emissions associated with current applications of natural gas can be achieved by substituting with renewable natural gas.



Transportation

- We will see an increase in the adoption of EVs to meet the federal target of 100 per cent zero-emission passenger vehicle sales by 2035 and 100 percent of medium-duty vehicle sales by 2040. There are more than 600,000 passenger vehicles on the road in New Brunswick today. Each year, approximately 40,000 new passenger vehicles and 4,000 medium-duty vehicles are registered. Over time, EVs are expected to be the primary vehicles on the road. By 2035, as many as 235,000 electric passenger vehicles will be on New Brunswick roads and highways assuming the supply chain and manufacturers are able to support this growth.
- Both public and private charging infrastructure will be developed to ease the transition to EV adoption.
- Alongside electricity, hydrogen will play a role in decarbonizing the transportation sector in applications such as trains and long-haul trucking. Hydrogen demand in the transportation sector is projected to be equivalent to 33,300 litres of diesel each day by 2035.
- Biofuels such as ethanol, biodiesel, renewable diesel and sustainable aviation fuel (SAF) will have a role to play as replacement fuels for existing transportation fuels. The use of these fuels is expected to double between now and 2035.



Residential

- Electricity usage will increase as new homes are built to house our growing population, we will increasingly replace our gasoline-powered vehicles with EVs, and ground source heat pumps will replace heating oil or propane in homes across the province.
- Households will see a continued shift to electricity for space and water heating purposes. The province has planned to phase out heating oil in all homes by 2030.
- Some of this increased demand will be offset by homeowners making energy efficient choices such as choosing more efficient appliances, installing programmable thermostats and replacing electric baseboards with electric heat pumps to heat their homes. New homes built in the province will also be built to more efficient standards, lowering their total energy use.



Commercial / Institutional

- Our province is growing, and so will the demand for electricity in our offices, hospitals, and universities. As our province grows, this will increase energy requirements across the sector to keep our businesses running and support further economic development and job creation.
- In our 2022 climate change action plan, the government committed to exploring ways to phase out use of heating oil in all commercial and government buildings. This will require alternative heating sources to be implemented in those buildings, such as electrification of space heating, resulting in further demand for electricity and lower carbon fuels between now and 2035. Increased use of biomass is also an option as an alternative heating source and is currently being used in some locations.

All these changes will depend on the coordinated action of homeowners, small-and-medium business owners, industry, NB Power and government to sustain progress towards our provincial net-zero ambitions.

ELECTRICAL ENERGY

New Brunswick will need to increase its generating capacity by approximately 60 per cent from 14,500,000 MWh in 2022 to 23,400,000 MWh in 2035 to meet the projected increase in electricity demand (Figure 2.1). This increased requirement for electricity will be driven largely by the industrial demand as shown in Figure 2.2. The demand growth associated with a growing population and phasing out heating oil will be somewhat offset by energy efficiency measures and the adoption of efficient ground source heat pumps. The transportation sector will see demand increases arising from electric vehicle adoption of approximately 425 per cent over current levels. Peak demand, which is the measure of the highest electricity consumption in a year, is forecast to increase from 3,000 MW to 4,000 MW by 2035.

FIGURE 2.1 NEW BRUNSWICK'S FORECAST ELECTRICITY DEMAND

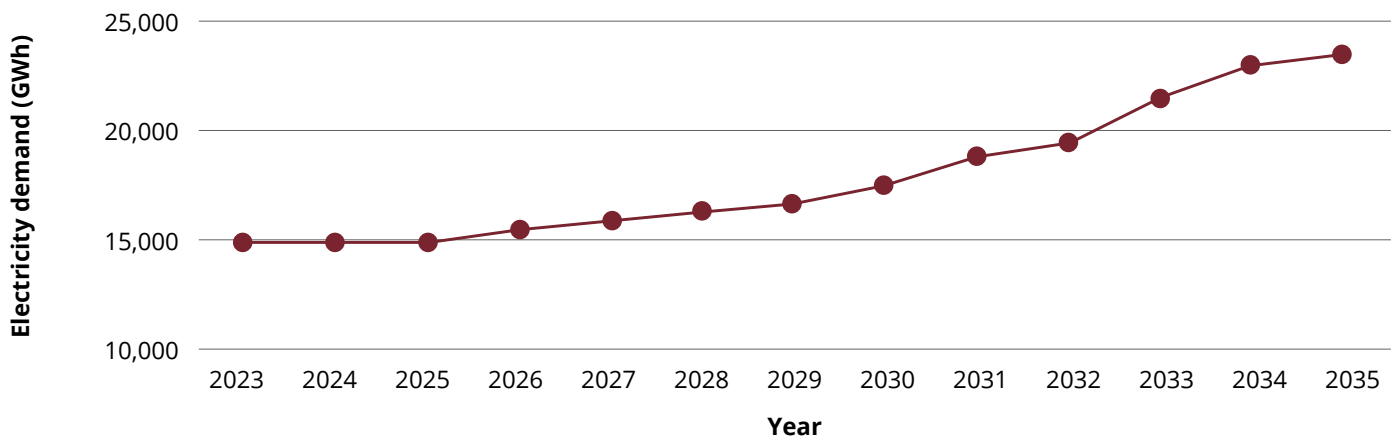
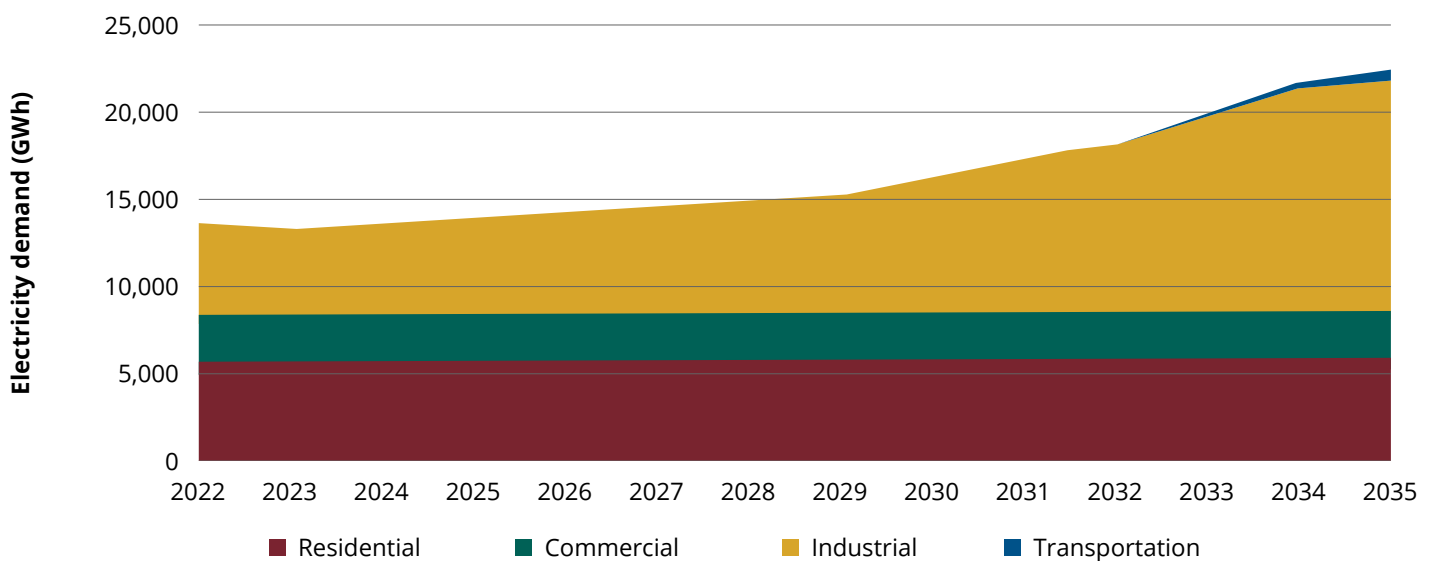


FIGURE 2.2 ELECTRICITY DEMAND PROFILE ACROSS VARIOUS SECTORS FROM 2022 TO 2035



Electrification will play a key role in helping New Brunswick reduce our GHG emissions. As such, it is a priority of the Government of New Brunswick to accelerate the electrification of our economy. The electricity sector has a role to play in critical and linked ways:

- Shifting away from heavy fossil fuel fired power generation towards non-emitting and low-emitting power generation.
- Integrating the existing generation facilities, (e.g., hydroelectric, combustion turbines, renewables and nuclear) with innovative technologies (e.g., energy storage, microgrids and SMRs) that will be necessary to operate the electricity grid of the future.
- Having peaking capacity available using natural gas and other potential new dual fuel generation.

This transformation, along with energy efficient choices made by homeowners and businesses across New Brunswick, will be the primary driver of GHG emissions reductions across our province in the years to come.

Our current electricity consumption is supplied by a variety of both clean and GHG-emitting generation sources. Today, approximately 80 per cent of New Brunswick's electricity is supplied by carbon-free sources. To emphasize the continued development of clean electricity, our government has committed to phase out coal-fired power plants by 2030 and increase clean electricity production by investing in new generation from wind, biomass, solar, and nuclear energy. New Brunswick aims to achieve net-zero emissions in its electricity sector by 2035 as part of our larger ambition to achieve a net-zero economy by 2050.

To achieve these targets, clean electricity generation will grow significantly as we move toward 2035. To that end, the province has planned to have installed 1,400 MW of wind power generation, 600 MW of nuclear SMRs, and 500 MW of solar generation (grid-connected and behind the meter). Figure 2.3 shows the planned progression in the growth and reduction of generation capacity from 2023 to 2035. The net installed capacity will be approximately 6,900 MW. Figure 2.4 displays the installed capacity supply mix from various electricity generation sources in 2035. Our installed generation capacity will include wind (26 per cent), nuclear (19 per cent), diesel and oil (22 per cent), and hydro (13 per cent), while electricity generation from coal will be eliminated to align with province's coal phase out.

Not included in our energy strategy and the 2035 generation mix is tidal energy. The immediate focus of renewable energy growth will be centered around wind and solar, which are more advanced technology-wise and significantly lower cost at this stage. Tidal energy development and technological advances will continue to be monitored to determine its role as a potential source at some future date.

FIGURE 2.3: ELECTRICITY INSTALLATION CAPACITY CHANGE ACROSS VARIOUS ENERGY SOURCES FROM 2023 TO 2035

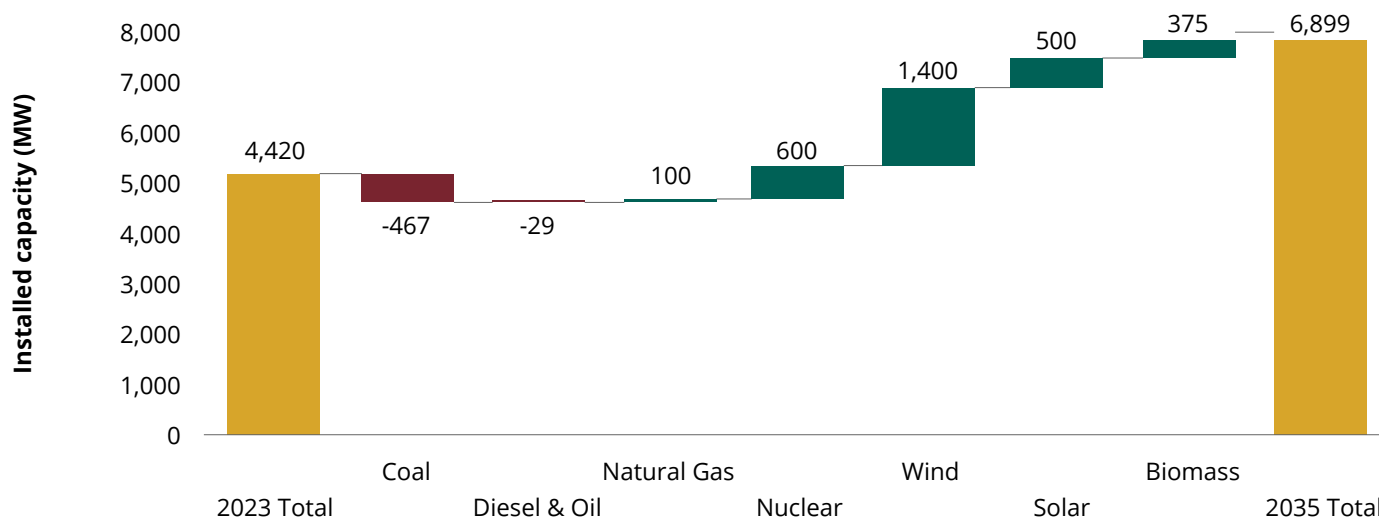
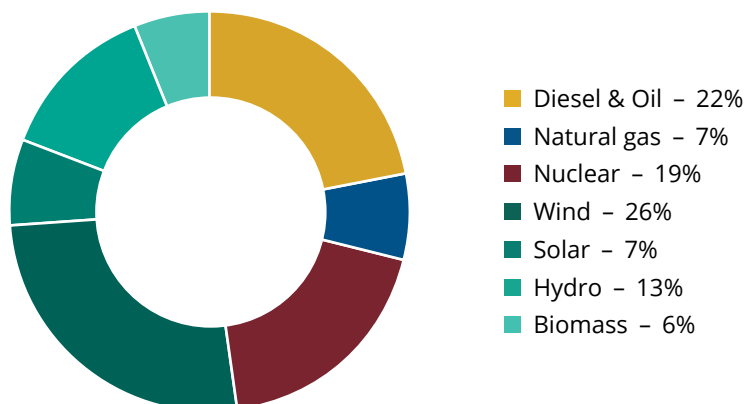
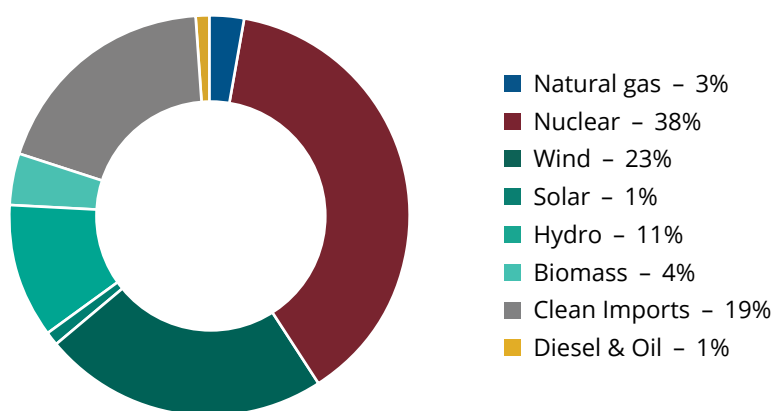


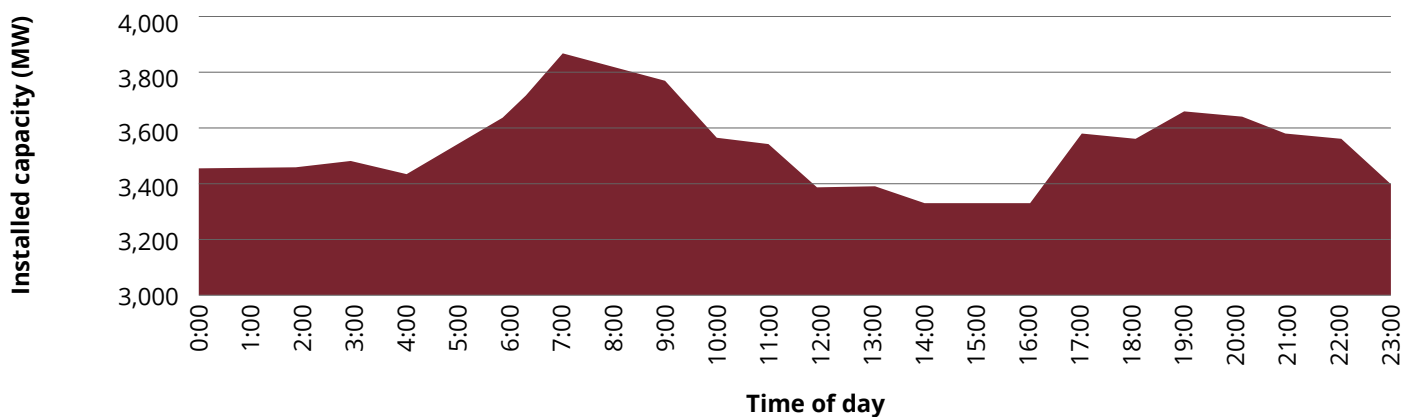
FIGURE 2.4: ELECTRICITY GENERATION INSTALLED CAPACITY BY SOURCE IN NEW BRUNSWICK IN 2035**FIGURE 2.5 ACTUAL ELECTRICITY SUPPLY BY SOURCE IN NEW BRUNSWICK IN 2035**

It is important to distinguish between the amount of installed capacity of each electricity generation source and how it is used to meet demand for electricity over time. As shown in Figure 2.4 and Figure 2.5, the contribution of different electricity sources of generation to meet demand will be different because of availability, performance and the relative cost to produce electricity. Though we will continue to maintain our emitting generation sources such as diesel, oil and natural gas for reliability purposes, in reality these are only expected to contribute a relatively small amount of generation to meet demand in 2035. Non-emitting generation sources such as wind, nuclear and hydro in addition to clean imports from our neighbours will be the primary sources of actual electricity supply in the future.

Multiple factors contribute to the increase in electricity demand as identified in the previous section. We need to plan to have sufficient installed generation capacity to meet the highest peak demand periods of the year. These periods typically take place in January and February, the coldest months of the year when New Brunswickers rely most heavily on electric heating. Between now and 2035, this peak demand is expected to grow from approximately 3,000 MW to nearly 4,000 MW.

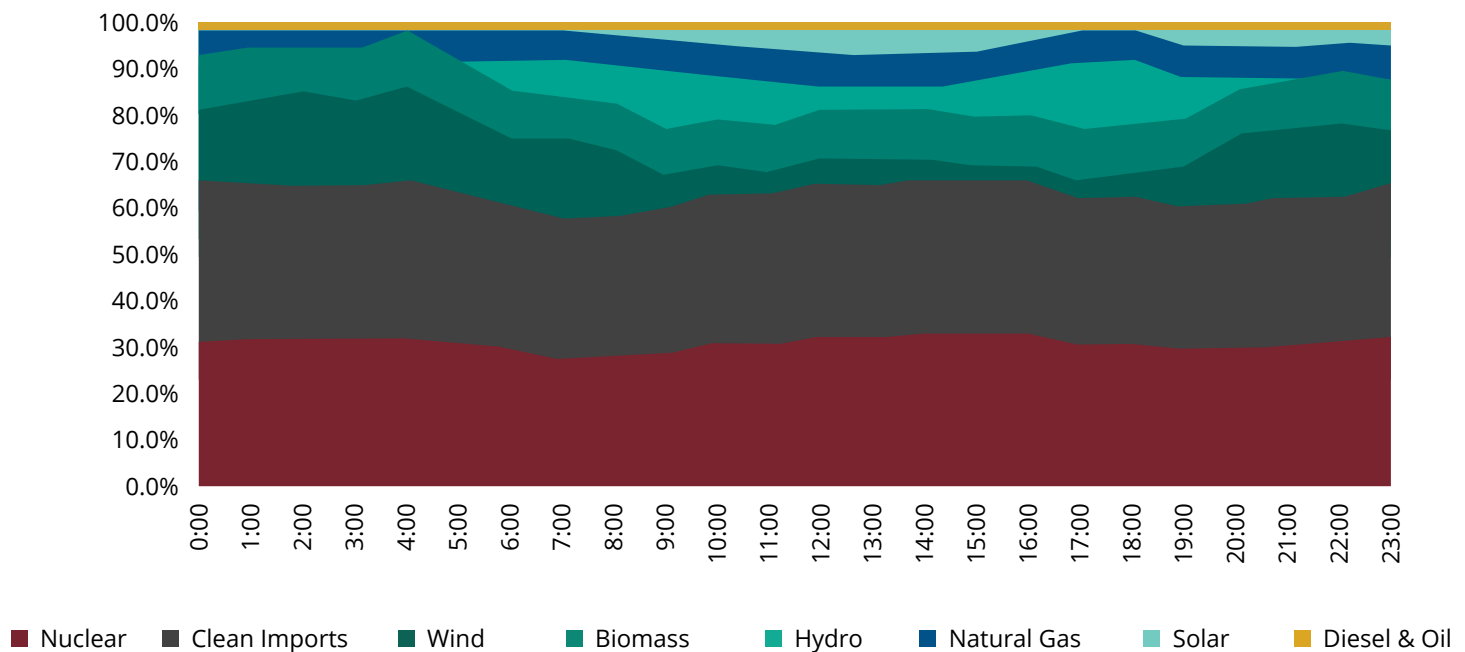
The morning and evening times will continue to be the times of peak demand due to the activities of New Brunswickers at home before and after their workday (Figure 2.6).

FIGURE 2.6: ELECTRICITY DEMAND ON A TYPICAL DAY IN JANUARY OF 2035



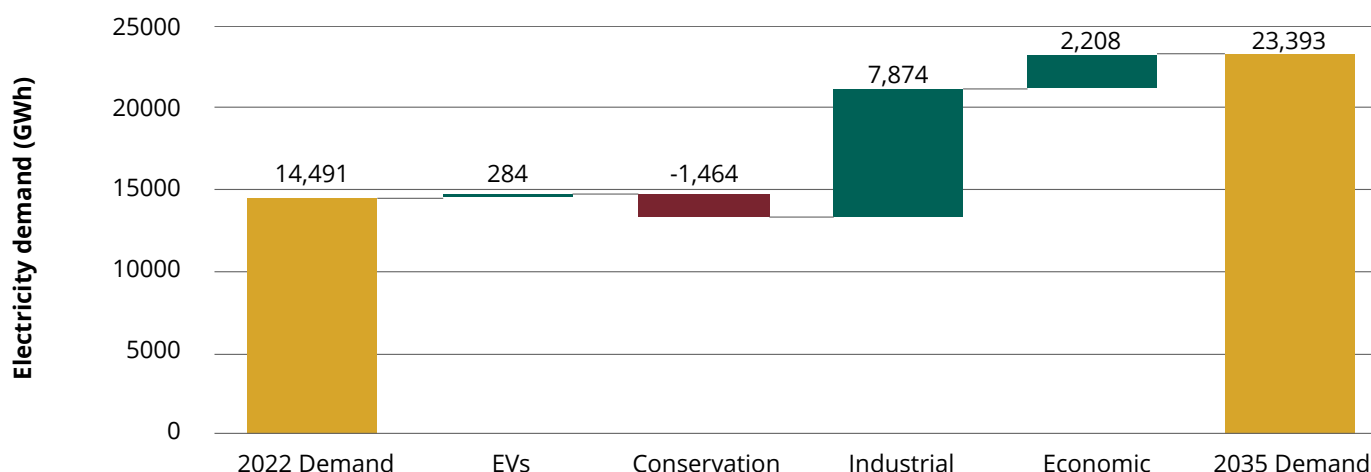
With the addition of cleaner energy sources, the energy supply mix in 2035 will look a lot different than today. As an example, in looking at a typical winter day in January of 2035 from Figure 2.7, most of the electricity demand would be fulfilled by clean imports (32 per cent), followed by nuclear (31 per cent), wind (11 per cent) and biomass (11 per cent). Hydro and natural gas will contribute approximately five per cent and six per cent, respectively, and other sources will fulfill the remaining peak demand. Solar will pick up during daylight hours while wind will generate most of its electricity overnight, from evening until morning.

FIGURE 2.7: ELECTRICITY SUPPLY MIX ON A TYPICAL DAY IN JANUARY OF 2035



As noted in Section 2.2, there are multiple drivers for the increase in electricity demand from 2023 to 2035. With an increase in the demand, the province will also focus on energy conservation through demand side management. This will help reduce the overall increase by almost 1,500 GWh. Industrial growth is going to account for the most increase in the electricity demand as shown in Figure 2.8.

FIGURE 2.8: ELECTRICITY DEMAND CHANGE FROM 2022 TO 2035 AND ASSOCIATED IMPACTS



MEETING GROWING ELECTRICAL DEMAND

To meet the growing demand for electricity, our province is committed to the development of a diversified and reliable energy portfolio.



Growing Nuclear

New Brunswick is one of only two provinces in Canada with nuclear operations and nuclear has been the backbone of our baseload power for over 40 years, representing 15 per cent of our installed generating capacity in the province.

As a member of the Pan Canadian SMR plan, New Brunswick is investing in SMRs and working in collaboration with Ontario, Alberta and Saskatchewan. SMRs are smaller, modularized, and lower cost than conventional nuclear generation and more flexible in working in concert with renewables like wind and solar.

New Brunswick sees the growth of new nuclear through SMRs as an essential element to meet demand and achieve a clean energy grid by 2035. Our plan, working with NB Power, is to have 600 MW of new capacity installed by 2035 located at the Point Lepreau Nuclear Generating Station. We expect the first 150 MW of power to begin coming online in 2030.

This clean baseload power will ensure we are able to meet the increasing demand in our province while working in concert with the ongoing growth of intermittent renewables. This new generation will almost double the nuclear capacity of the province from the existing 663 MW to approximately 1,263 MW by 2035.

At the same time the optimization of the operation of our existing CANDU nuclear reactor is a critical aspect of ensuring we meet our increased demand and continue to work to make energy affordable for New Brunswickers. To that end, our government will be working with and ensuring NB Power finds collaborative partners and arrangements to allow for improvements in reliability of this important asset.



Expansion of Wind Capacity

We are blessed with exceptional wind resources and we intend to significantly grow our wind capacity over the next 12 years. It is forecast that up to 1400 MW of wind power is required by 2035. To integrate further wind generation into our supply mix, the Government of New Brunswick will establish targets for NB Power to acquire new wind generation facilities through power purchase agreements with developers.

One such procurement is already underway with 200 MW of wind projects expected to come online in 2027. A further 400 MW will be added in each of 2029, 2031 and 2033. These targets will be evaluated jointly with NB Power and re-examined at regular intervals to ensure that the investments are keeping pace with the actual requirements of the power system and are aligned with provincial policies.

This new wind generation will not only complement our grid but offer investment opportunities and allow us to leverage and grow our supply chain here in the province, creating jobs, investment and at the same time, reducing GHGs.

It is also our intent to reassess the capacity of our on-land wind resources and establish an offshore wind development process to have in place by 2024 should offshore development be of interest.



Grid Scale Solar

To integrate solar generation into our supply mix, the Government of New Brunswick will establish targets for NB Power to acquire new solar generation facilities through power purchase agreements with developers. Those projects are targeted to come online beginning in 2028, with 25 MW of installed capacity being added each year until 2035 reaching a total of 200 MW of new, grid-scale solar power. These targets will also be evaluated jointly with NB Power at regular intervals to ensure demand and cost are in balance and are aligned with provincial and federal policies.

In addition to the grid scale solar electricity generation discussed above, our province is expecting steady growth in distributed solar generation which is installed primarily on rooftops of residential and commercial buildings, often referred to as “behind the meter”.

This growth will be supported by an expected significant reduction in the cost of solar panels, current and future policies on net-zero building requirements, and voluntary solar installation by residential, commercial and industrial customers to generate and use clean energy.

NB Power’s Net Metering Program supports customers in making this choice, allowing them to generate up to 100 KW of their own renewable energy, using sources like biogas, biomass, solar, small hydro or wind. Currently, there is 5.6 MW of installed solar capacity through the net-metering program and this is expected to grow to up to 300 MW in 2035. New Brunswick will be investigating potential programs to aid in the expansion of this power generation source.



Conversion of Belledune to Biomass

In 2018, the federal government introduced restrictions on the use of coal for electricity generation beyond 2030. The Belledune Generating Station is the province's only coal-fired power plant. It is known for being a dependable and affordable source of energy. Recognizing the important role that Belledune plays in the provincial supply mix and local economy, the Government of New Brunswick and NB Power will undertake a capital project to convert the station and eliminate the use of coal a full decade earlier than originally planned.

Biomass is an abundant resource in our province and its use in the production of electricity has been growing globally. With the requirement to have the Belledune Generating Station end all generation from coal by 2030, and through working with NB Power, we are currently assuming a conversion to biomass as the best alternative form of energy for this facility, a decision that will be finalized in 2024.

Converting to biomass would reduce the overall capacity at Belledune from its current 467 MW to 375 MW, however, a conversion will allow this important asset to continue to be an important part of the provincial energy system. With the conversion of Belledune, plus other biomass generation facilities in the province, the biomass fueled generation capacity would reach 494 MW by 2035.



Enhanced Battery Storage

Wind and solar generation are intermittent sources of electricity. When installed in combination with energy storage technologies such as battery storage, they become reliable sources to meet electricity demand even when the wind is not blowing, or the sun is not shining. Energy storage allows excess energy to be stored and then provided to the electricity grid when it is needed, often at a time of peak electricity demand or when output from wind and solar generation is low due to weather conditions.

In early 2023, NB Power issued a procurement for 50 MW of new energy storage and Saint John Energy has recently added 7 MW of battery storage. We believe this storage capacity needs to grow. By 2035, an additional 100 MW of energy storage will be obtained through procurements to work in concert with the expanded wind capacity. This need will also be re-evaluated as technology continues to advance and the requirement for additional energy storage grows.



Refurbishment of the Mactaquac Dam





The Mactaquac hydroelectric generation facility is the major hydro generation station in New Brunswick, and it supplies approximately 12 per cent of the total electricity consumed in the province. Although this asset's life was originally estimated to be 100 years, providing clean electricity until 2068, current conditions indicate that significant work is required to rehabilitate various concrete structures at the facility. According to studies performed by NB Power, the impacted structures, as well as the turbine generating units, will require refurbishment or replacement by 2030. While the province and NB Power evaluate the cost-effectiveness and reliability impacts of various paths forward, the Mactaquac Life Achievement Project has been put forward for consideration to achieve the full 100 years of expected life of the facility.

REFURBISHMENTS AND RETIREMENTS

To maintain the reliability of the provincial power system while at the same time exploring opportunities to decarbonize our supply mix, the provincial government and NB Power have worked collaboratively to identify cost-effective opportunities to refurbish some existing generation facilities and retire others.

By exploring the opportunities to extend the life of Grandview, Millbank, and Sainte-Rose, we will ensure the reliable supply of cost-effective electricity generation as part of our overall supply mix.

TABLE 2.1: FOSSIL FUEL ELECTRICITY GENERATION RETIREMENT SCHEDULE

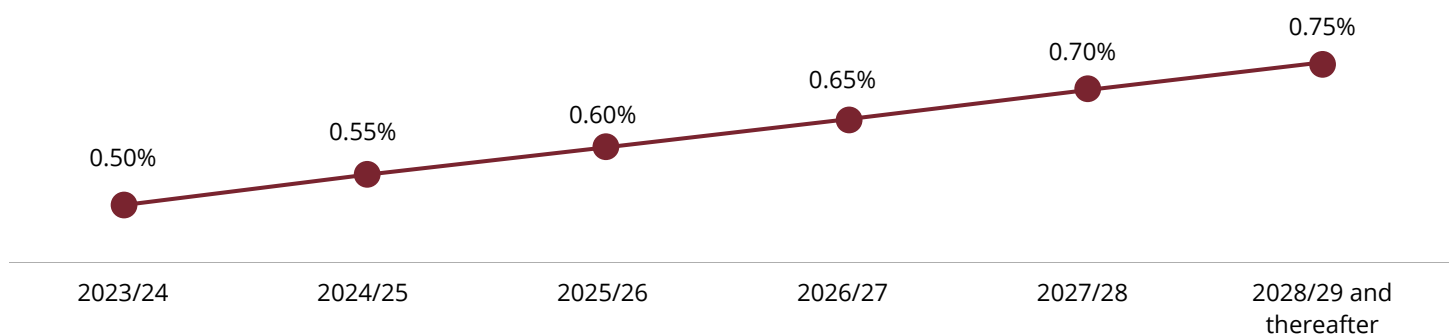
Facility	Fuel Type	Capacity (MW)	End of Life	Extension
Grandview	 Natural Gas	95	2023/25	Yes
Grand Manan	 Diesel	26	2025/26	No
Millbank	 Diesel	397	2030/31	Yes
Sainte-Rose	 Diesel	99	2030/31	Yes

ENERGY CONSERVATION

The higher our electricity demand, the higher the cost to replace fossil fuel-based sources with clean energy sources. If we can focus on reducing the electricity demand, it will become easier for the province to fulfill the needs of New Brunswickers with clean energy. Demand side management allows electricity users to play an important role in saving energy and reducing the need for infrastructure investment on New Brunswick's electricity system.

Energy efficiency is applicable in every sector, residential, commercial, institutional, and industrial. An average New Brunswicker can participate in energy conservation in many ways such as installing programmable thermostats to control heating and cooling, replacing incandescent lights with light emitting diode (LED) bulbs, upgrading the insulation in their homes to minimize energy loss, turning off unnecessary lights when not in use, using low flow water taps and shower heads to reduce electricity usage to heat water and many other options. Energy efficiency not only helps reduce emissions but also lowers energy costs. The Government of New Brunswick has set an energy efficiency target to save the equivalent of 0.75 per cent of all electricity consumed in the province each year from 2028 onwards (Figure 2.9). This means that by 2035, New Brunswickers will have saved nearly 10,000 GWh of electricity that otherwise would have been required to be generated.

FIGURE 2.9: ELECTRICITY EFFICIENCY TARGETS (% OF IN-PROVINCE ENERGY SALES)



In addition to energy efficiency, Demand Response, an approach where electricity users are incentivized to change their consumption, is another tool that can reduce the amount of generating capacity that we need. Demand side management can be in the form of unique rate structures, programs designed to target appliances such as water heaters, or incentives for commercial or industrial consumers to reduce their consumption of electricity when the grid is under stress. By 2030, 90 MW of demand response capacity will be available to help meet system needs.

Today, 18 MW of demand side management is available to offset peak demand, but this is expected to increase to more than 300 MW by 2035. NB Power is expecting 63,000 MWh in electricity saving in 2023 with this number growing steadily to 1,530,000 MWh in 2035 through a combination of energy efficiency and demand response measures.

ELECTRICITY TRANSMISSION

With the significant increase in electricity demand and changes in the overall supply mix and location of electricity generation, transmission lines are critical infrastructure required to move electricity from where it is generated to our homes and businesses when we need it. NB Power is tasked with studying and forecasting transmission needs to meet growing demand and expected conditions on the power system. When transmission needs are identified, they can be met in several ways, such as:

- Strategically locating new generation,
- Introducing new demand side management programs, or
- Building new transmission towers.

NB Power is actively studying the need for new transmission infrastructure within the province following the release of the IRP earlier this year. The government is also working with neighbouring provinces and their utilities to develop a regional approach to transmission development and the building of new generating capacity. The new generation investments noted above form New Brunswick's commitment to this regional approach to electricity development. In addition, NB Power has identified that an additional 800 MW of transmission between New Brunswick, Nova Scotia and Prince Edward Island is required to complement this new generation development and enable efficient imports and exports of electricity throughout the Atlantic provinces. Figure 2.10 shows the planned regional upgrades of the electricity transmission system.

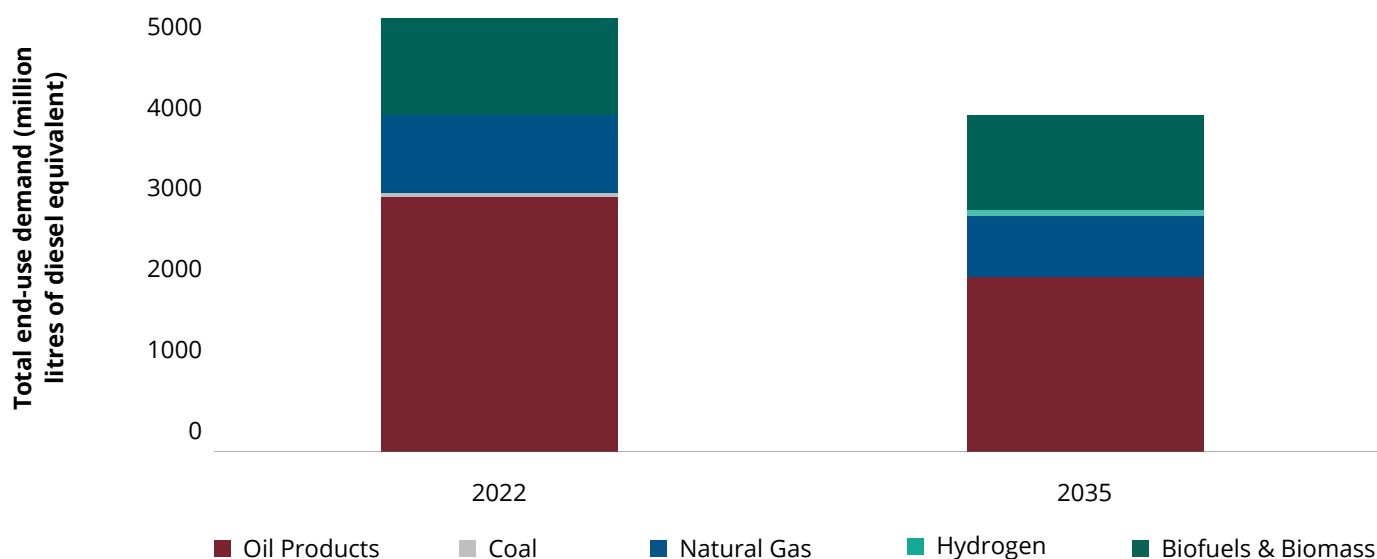
FIGURE 2.10: REGIONAL ELECTRICITY TRANSMISSION UPGRADES BY STAGE



NON-ELECTRICAL ENERGY

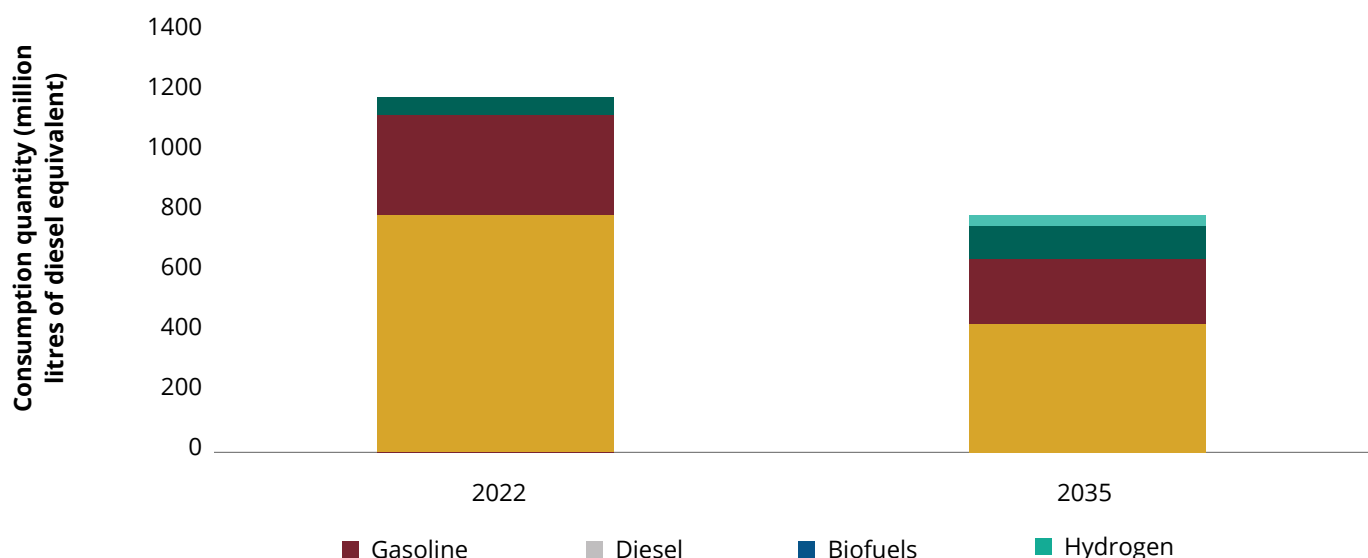
Energy consumption in our province involves more than just electricity. As we move into the future, new energy sources will be developed in the province for transportation, residential and commercial heating, and industrial decarbonization where electrification is not practical. Energy carriers and sources such as hydrogen, natural gas, renewable natural gas, biofuels, biomass and others will develop to fulfill the energy demand. There is going to be an overall decrease in the demand of coal, oil products and natural gas. Hydrogen is going to see a significant growth in demand with the increase in its end use across industry, transportation, and other areas. Figure 2.11 shows the provincial total end-use demand from all sectors, excluding transportation, will decrease from approximately 4,350 million litres of diesel equivalent in 2022 to approximately 3,400 million litres of diesel equivalent.

FIGURE 2.11: TOTAL END-USE DEMAND OF FUELS IN 2022 VS 2035



The transportation sector will follow a similar trend with a decrease in the overall demand led by the reduction in gasoline. This will primarily be driven by adoption of EVs. Gasoline and diesel will see a decrease of 46 per cent and 34 per cent from 2022 to 2035 whereas biofuels demand will increase by 91 per cent. In the same duration, hydrogen demand will grow from 0 to approximately 38 million litres of diesel equivalent. Hydrogen use is expected to increase with technological advancement in hydrogen fuel cell vehicles and their adoption in the market. Figure 2.12 shows the consumption quantity of these fuels in 2022 vs 2035.

FIGURE 2.12: CONSUMPTION OF TRANSPORTATION FUELS IN 2022 VS 2035



Development of the Hydrogen Industry

Hydrogen is one of the most abundant elements on Earth, accounting for approximately 75 per cent of all mass. There are several benefits of using hydrogen in the energy sector such as its higher suitability for energy-intensive sectors and the ability to transport it over long distances currently in the form of ammonia. Perhaps most importantly, the by-product of using hydrogen is entirely carbon-free, making it a key decarbonization solution, especially in sectors where electrification is not feasible.

Hydrogen can be produced in several ways depending on the feedstock and technology employed. The hydrogen produced is physically identical in each case, but the emissions associated with its production vary. The primary methods of producing hydrogen are as follows:

- Grey hydrogen is produced today using natural gas with a process of steam methane reforming, where natural gas is mixed with very hot steam and a catalyst. It has many applications in the industrial sector. This method of hydrogen production results in GHG emissions.
- Blue hydrogen is produced from natural gas in the same way as grey hydrogen with carbon capture and sequestration added to capture the released GHGs or CO₂ emissions. This method of production results in much lower GHG emissions than grey hydrogen.
- Green hydrogen is produced using electrolysis of water using renewable energy such as hydro, wind, or solar. Its production does not result in GHG emissions.
- Pink hydrogen is produced via electrolysis, in the same way as green hydrogen using electricity from nuclear powered reactors. This method of production results in minimal GHG emissions.

New Brunswick has the resources, location, and expertise to be a leader in the production of hydrogen for both domestic and international markets. Recently, Canada signed an agreement with Germany to export green hydrogen and green ammonia produced from hydrogen from the year 2025 onwards.

Hydrogen also has the potential to reduce the emissions intensity of New Brunswick's current use of natural gas by blending hydrogen with natural gas into existing natural gas infrastructure. Blending hydrogen with natural gas, in modest amounts

such as five per cent of the total volume, will allow for the use of this blended gas in industrial applications and where natural gas is used in residential applications today, without the need for expensive new pipelines, equipment or appliances. It can also be used in high-temperature applications that are difficult to electrify and where natural gas is currently used.

Our government believes the incubation and development of this new energy source is very important and that we have the capability to create hydrogen hubs in both Belledune and Saint John, focused initially on the export market while the domestic market develops.

In the domestic market, we believe there will be hydrogen blending at rate of five per cent into the natural gas network over time displacing a small amount of natural gas locally by 2035; there will be some opportunity for the use of hydrogen in homes as a possible replacement for propane; and by 2035 we expect 5 per cent of the fuels used in the heavy haul transportation sector including rail, long haul trucking and marine to be converted to hydrogen.

As such, we will be releasing a New Brunswick hydrogen roadmap to lay out our plans to assist this industry over the next five years and we are committed to supporting the development and start-up of at least one large production export facility sometime between 2027 and 2035.



Biofuels

Biofuels refer to alternative fuels that can be used instead of the fuels with which we are most familiar in the transportation sector. These alternative fuels include ethanol, biodiesel and renewable diesel.

Ethanol is a fuel produced using corn as a primary input which can then be blended with gasoline and used in compatible vehicle engines. Sometimes called “flex fuel,” an E85 gasoline-ethanol blend contains between 51 and 83 per cent ethanol and can reduce emissions by 40 per cent when compared to a gasoline-only fuel. Since only certain engines are fully compatible with E85, it will be important that a measured approach to ethanol blending be taken in our province. New Brunswick currently has no requirement for blending ethanol with gasoline, however, this can be a lever to decarbonizing the transportation sector while it transitions towards EVs.

Biodiesel and renewable diesel can be used as a “drop in” replacement for existing diesel fuel produced using petroleum, meaning that they can be used interchangeably with the diesel you would find at a gas station in New Brunswick today. As such, vehicle engines running on diesel can adopt biodiesel or renewable diesel without needing any modifications. Biodiesel and renewable diesel reduce the total GHG emissions compared to petroleum-based diesel by 74 per cent and 65 per cent respectively. The use of biofuels can reduce the level of emissions in the transportation sector, particularly for passenger vehicles and fleet vehicles that run on diesel. The province will explore ways of making biofuels more available for consumers who want to adopt them. The province expects biofuel consumption to double from approximately 57 million litres of diesel to 114 million litres of diesel.



Natural Gas

Natural gas will continue to play an important role in powering our province with energy, and 380 MW of electrical generating capacity from natural gas will still remain online by 2035 for peak capacity with an additional 100 MW of dual fuel-capable generation. The use of natural gas in industrial applications will still be significant in 2035.

Virtually all the natural gas consumed in New Brunswick is imported and this will continue to be the case in New Brunswick and Atlantic Canada barring further development. Natural gas is currently used across the residential, commercial and industrial sectors with the industrial sector being the largest consumer.

There will be a significant role for natural gas well into the future as a fuel for peaking electricity generation, for blending with hydrogen, as a feed stock for blue hydrogen production should that be developed, as an important fuel in decarbonizing the global economy and for energy security in Europe.

Many countries still rely on higher-emission sources of energy such as coal-fired generation and oil. New Brunswick's undeveloped natural gas reserve is estimated to be approximately 77 trillion cubic feet, and our proximity to the rest of Atlantic Canada and Europe still provides an opportunity to supply international markets with cleaner LNG that would immediately offset higher-emission energy sources. These markets are eager to find new sources of natural gas, in the form of LNG, given the curtailment of natural gas supply from Russia following its invasion of Ukraine in 2022.

It is estimated that global LNG demand will increase 70 per cent between now and 2040. Our province will continue to explore opportunities to support global decarbonization and enhance energy security. If a path forward could be found for development of this resource, it would be transformational for our province and our residents.



Renewable Natural Gas

Much like biofuels for transportation, renewable natural gas is a form of natural gas that can be substituted for traditional natural gas without the need for new equipment or infrastructure. It is produced by capturing and digesting the biogas released from decaying material such as landfill waste, biosolids from water treatment, organic waste from food processing or agriculture waste. Renewable natural gas is already being produced at the Southeast Eco360 waste management facility near Moncton. In the climate change action plan, our government committed to enabling the local production and use of renewable natural gas and the building of enabling infrastructure.

2.3 ENVIRONMENTAL IMPACT

To minimize the impact of climate change and support the federal government's target of emissions reduction, the Government of New Brunswick published its climate change action plan, which describes the actions we are taking to achieve the target of reaching net-zero emissions by 2050.

Reducing GHG emissions across our entire economy will be necessary and, by taking advantage of the opportunities outlined above, with every New Brunswicker playing their part, we can realize this goal.

The electricity sector will achieve its decarbonization journey through the following steps:

Energy conservation: We will continue to have a significant focus on energy conservation programs and providing smarter technology to customers allowing them to influence their energy demand and costs



Phase out of coal by 2030: The conversion of Belledune to biomass will eliminate high-emitting coal-fired generation in New Brunswick



Offsetting fossil-fired generation with increased carbon-free power sources: Building new sources of non-emitting generation such as nuclear, wind and solar will satisfy New Brunswick's electricity needs into the future

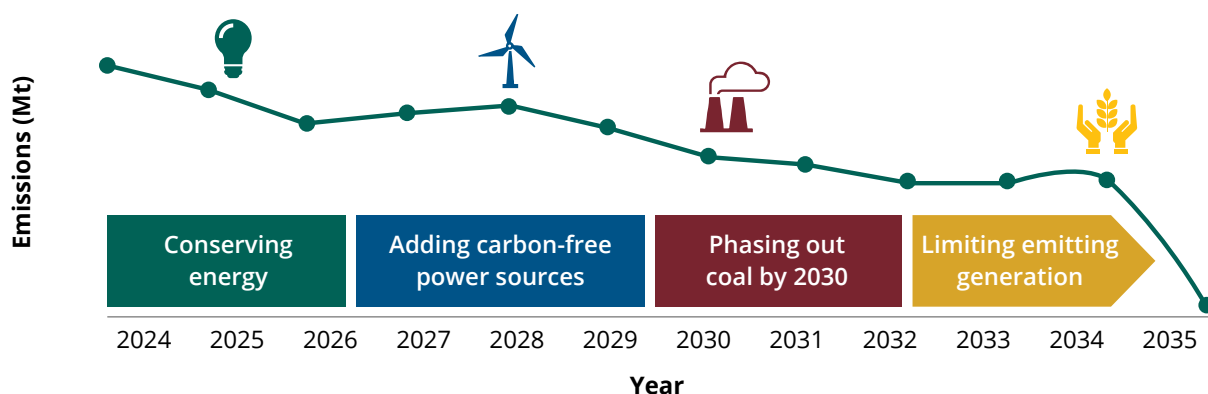


Limiting the use of emitting generation starting in 2035: When the federal government's Clean Electricity Regulations take effect in 2035, we will use our remaining fossil-fired generation only as peaking capacity



These actions will reduce GHG emissions for electricity generation to near zero by 2035, removing as much as 2.8 megatons of annual GHG emissions. Figure 2.13 shows the projected decrease in the emissions resulting from various initiatives and investments in electricity.

FIGURE 2.13: ELECTRICITY SECTOR EMISSIONS PROFILE FROM 2024 TO 2035

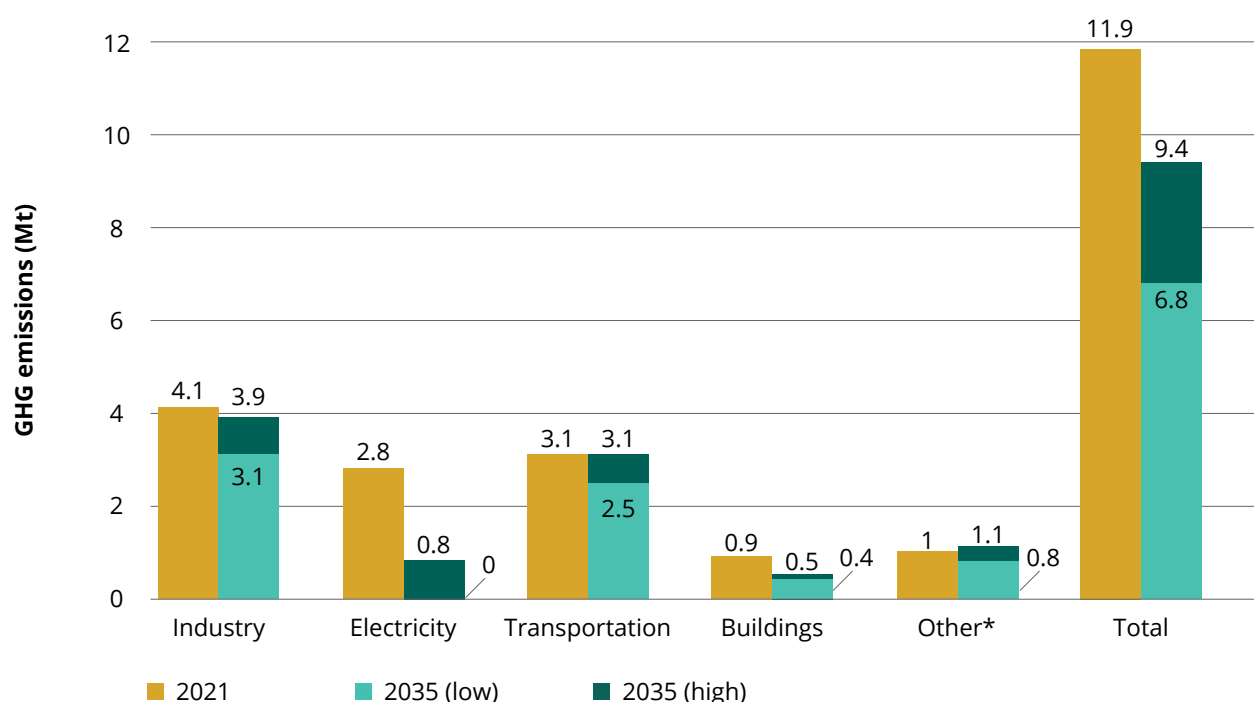


In addition to the changes to our electrical system, the advancement of technologies and new fuels will positively impact other sectors in our province. These include:

- **EVs:** The continued increase of EVs will significantly reduce the consumption of gasoline and resulting emissions.
- **Hydrogen and renewable natural gas:** The transition of hydrogen into the heavy transportation sector, the blending of hydrogen with natural gas and the use of renewable natural gas will allow a reduction of GHGs in hard-to-electrify sectors.

Aligning these measures with those being taken in the residential, commercial, industrial, and transportation sectors will reduce our overall emissions to 9.4 megatons (Mt) by 2035 with potential to reduce to as low as 6.8 Mt through a range of additional measures, as shown in Figure 2.14. This incremental reduction arises from specific steps taken in each sector of the economy and is supported by the initiatives outlined in our climate change action plan. This is important progress towards our goal of achieving a net-zero economy by 2050.

FIGURE 2.14: RANGE OF GHG EMISSIONS FOR NEW BRUNSWICK ACROSS ALL SECTORS



Source: Environment and Climate Change Canada

*Other refers to actions that are taken across multiple sectors, rather than within a specific sector, to achieve GHG emissions reductions. It also includes actions taken in sectors other than those specifically shown in the chart.

As can be seen, the targets are achievable especially when we work together.

2.4 OUR ENERGY FUTURE

New Brunswick is on a journey of growth and decarbonization that will result in a new energy environment that can lead to unprecedented growth and a path forward to a net-zero world. We are making the investments necessary across all sources of energy in the province to take control of our energy future and support economic growth in the years ahead.

Through the implementation of our energy strategy between now and 2035, we will pursue a series of key actions that support the decarbonization of our various sources of energy while maintaining reliability and affordability including:

- 01 Ensuring sufficient generation capacity to support economic growth and electrification by building 2500 MW of new clean electricity generation.
- 02 Focusing on increasing the operating efficiency of the Point Lepreau nuclear generating station.
- 03 Eliminating coal-fired generation in the province by converting Belledune Generating Station to be fueled by biomass.
- 04 Maximizing the utilization of existing electricity infrastructure such as generation through cost-effective decisions for refurbishments and life extensions.
- 05 Developing the charging infrastructure and making the necessary infrastructure upgrades to widespread adoption of EVs.
- 06 Building the necessary transmission infrastructure to move electricity effectively through the province and exchanging power with our neighbours.
- 07 Reducing the emissions intensity of gasoline and diesel-powered vehicles through increased adoption of biofuels such as ethanol and biodiesel.
- 08 Supporting the continued electrification of heating in the province by eliminating the use of heating oil and promoting the adoption of electric heat pumps.
- 09 Developing demand-side management programs to help New Brunswick consumers, large and small, take charge of their energy use.
- 10 Issuing a hydrogen roadmap for the province which will support the creation of a clean hydrogen economy in New Brunswick.
- 11 Exploring opportunities to support global decarbonization efforts through the export of LNG to international markets.

These actions and other initiatives, taken in collaboration with all New Brunswickers, will collectively reduce the current GHG emissions by nearly half by 2035, putting us well on the path to achieving a net-zero economy by 2050. The next section will describe benefits and opportunities related to decarbonization and present commitments by the Government of New Brunswick to realize the six principles of the clean energy vision.

CHAPTER 03

New Brunswick Energy Transition



New Brunswick Energy Transition

We have discussed what New Brunswick's energy picture is at present and where New Brunswick could be in 2035. This energy transition will present significant opportunities.

3.1 BENEFITS AND OPPORTUNITIES OF THE ENERGY TRANSITION

New Brunswick is well-positioned to meet our climate commitments and energy goals. We have many opportunities to support the transition to a strong, diverse, and competitive low-carbon economy. In addition to achieving our emission reduction targets and mitigating the impacts of climate change, the benefits of an energy transition include personal health, economic growth, and educational opportunities. The shift to net-zero objectives has resulted in worldwide interest and investment in low-carbon energy sources and New Brunswick is well-positioned to benefit from this investment.

With the global energy transition, New Brunswick is poised to leverage our geographic location to become an energy gateway for international and domestic markets, leveraging our natural resources and the skills and knowledge of our workforce and supply chains.

Access to international markets and inter-provincial connectivity: New Brunswick is a logistics hub. As one of Canada's most export-intensive provinces, we currently export energy and natural resources to domestic and international markets. Our strategic location with deep water ports, efficient highways, railways, and airports strongly positions the province for many forms of low-carbon transportation opportunities. Using locally produced clean power to create clean energy exports, we are well-positioned to ensure our existing exporters are part of a sustainable green supply chain, thereby safeguarding their existing markets and clients.

Availability of natural resources: New Brunswick has plentiful natural resources that can be used to reduce carbon emissions, not only here in the province, but internationally as well. Natural gas will continue to be required globally for decades to come and New Brunswick has a massive reserve of this resource. Responsible development of our natural gas reserves could play a significant role in decarbonizing other parts of the world by displacing higher carbon fuels. New Brunswick also has an abundance of critical minerals including copper, cobalt, zinc and manganese that are important components for energy transition. These natural resources could be further developed, providing a benefit to our economy, to our energy transition and to supply global energy markets.

New exports: With an abundance of clean energy supply and expertise, New Brunswick will be positioned to identify and seize new export opportunities in areas such as SMR technology and capability, LNG, biofuels and hydrogen.

Skills and knowledge of our workforce: New Brunswick has the advantage of having a highly skilled workforce which will be crucial to the success of the energy transition. Every year, the labour pool continues to be supplemented by new graduates and skilled international and interprovincial workers who have immigrated to the province. The advancement of the renewables sector will create new jobs in a new and growing industry as well as in the supply chain. Strengthening the collaboration between the province and the academic sector could further nurture the growth of a homegrown workforce specialized in renewable energy which will help to drive future economic prosperity for New Brunswick.

Quality of life and health: Reduced emissions from high-emitting fuels improves air quality and the health of our communities. In addition, job creation and GDP growth create new sources of revenue for the province that can be used to fund programs such as health care, housing and energy cost reduction initiatives for all New Brunswickers.

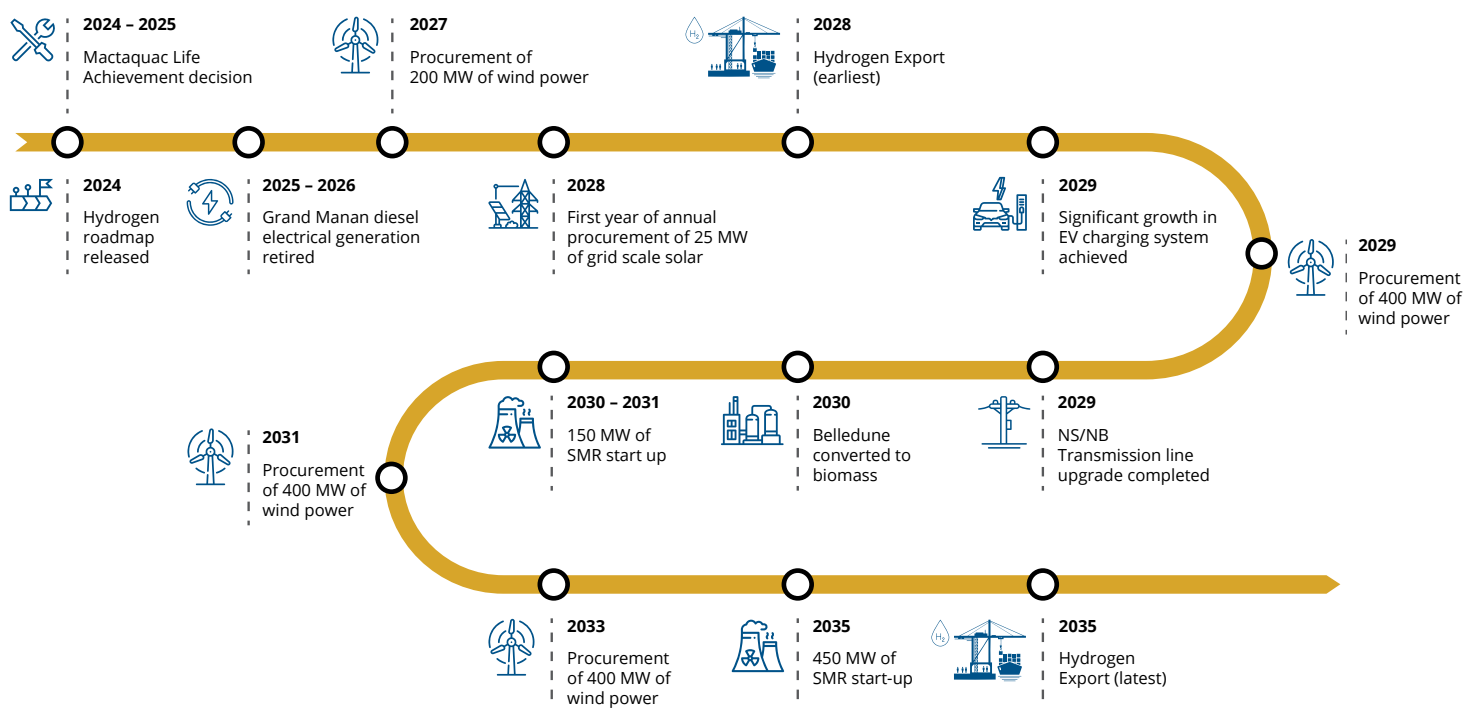
New technology development and deployment: As the energy transition occurs, it will create job opportunities for future generations of New Brunswickers related to the development of new technology and other knowledge-based industries.

New industry and infrastructure: Future investments will include SMRs and other renewable energy technologies in addition to the associated construction and participation in the clean energy supply chain (e.g., critical minerals). Other investments will potentially include EV charging infrastructure, public transportation fleet changes and other infrastructure changes and retrofits to meet efficiency guidelines.

Increasing activity in the housing sector: With the population growth experienced during the COVID-19 pandemic, New Brunswick has had a surge in residential investment and housing unit construction. With this present and forecast future housing sector expansion, there is an opportunity for the province to increase the energy efficiency of residential sector development. Increased energy efficiency of our structures, low-carbon building solutions, and residential scale solar installations will all help to expedite our transition towards a low-carbon economy.

NEW BRUNSWICK ENERGY TRANSITION ROADMAP 2023 TO 2035

This roadmap identifies some of the key activities and decision points with respect to our energy transition over the next 12 years. As we progress forward, we know that there will be ongoing changes in policies, regulations, technologies and markets. Given those anticipated changes, it is well understood that the roadmap will undergo ongoing updates as we progress.

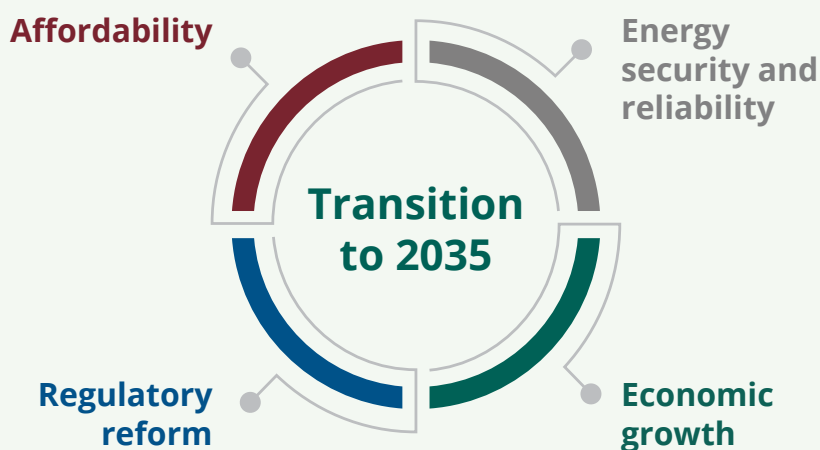


3.2 TRANSITION TO 2035

Engaging New Brunswickers with respect to this roadmap is critical to ensure that we receive everyone's input on the recommended plans. Therefore, in conjunction with the release of this document, we will be forming an energy transition working group. This working group will be chartered to engage with First Nations and key stakeholders to solicit the necessary input and feedback that will assist us in the development of our plans through ongoing dialogue.

There are four major strategic initiatives that will be addressed as part of the energy transition:

Metrics and key performance indicators will be established for each strategic initiative as the programs are developed.



Affordability

Our government is committed to ensuring energy costs are affordable and competitive for all New Brunswickers. This involves actions on several fronts including energy reduction programs, enhanced savings programs and the review of our delivery model.

- 01 Advanced metering will be installed across the province by 2025 to allow customers to better manage their energy costs. In parallel, an energy app will be developed to allow customers to make informed real-time decisions on energy usage.
- 02 NB Power will introduce a new off-peak energy rate for residential customers.
- 03 The province will leverage the federal Low Carbon Economy Leadership Fund to establish a number of new energy efficiency programs that are currently under development. This will include an enhanced solar program targeting behind-the-meter solar, that will improve customer access and make solar energy more affordable.
- 04 We will undertake a full review of the conservation programs and delivery model to determine if there are opportunities for enhancement.
- 05 The province will continue work with the federal government to access funding to help lower the cost of new generation in the province through the Canadian Infrastructure Bank, the Smart Renewables Electricity Pathways program, and the Clean Technology and Clean Electricity Investment Tax Credits.
- 06 We will review and modernize the Energy and Utilities Board (EUB) mandate to strengthen its regulatory and governance framework as needed, in light of the significant changes occurring in the energy market.



Energy Security and Reliability

New Brunswick must have a secure supply of electricity that supports climate change objectives and our growth agenda while maintaining a supply of reliable clean energy during all periods of peak demand. To ensure this, the following key initiatives will be undertaken:

- 01 We will support ongoing development and deployment of SMRs at Point Lepreau as means to grow our clean non-intermittent baseload electricity supply.
- 02 Point Lepreau will improve its operating profile and we will work with NB Power to enable the establishment of a partnership with another nuclear operator to improve performance, lower operational risk and lower cost for New Brunswickers.
- 03 Wind power procurement targets will be established with the utility to deliver up to 1400MW of new generation by 2035 in the following tranches:
 - 200 MW by 2027
 - 400 MW by 2029
 - 400 MW by 2031
 - 400 MW by 2033
- 04 Solar power will continue to become more cost effective and help diversify our energy supply. A grid scale solar target of 200 MW by 2035 will be set with annual procurements of 25 MW per year starting in 2028 through 2035.
- 05 We will support regional transmission upgrades with Prince Edward Island and Nova Scotia to enhance the interconnectivity and flow of electricity between our provinces.
- 06 To support the province's 2030 electric vehicle target, we will establish and deploy a plan to increase the public charging network.
- 07 We will complete the established review process for the Mactaquac Life Achievement Project.



Economic Growth

Our new energy ecosystem should power our economy and be a driving force for growth and prosperity in the province. Our goal is to transform New Brunswick into an energy gateway. To achieve this, we will:

- 01 Release a hydrogen roadmap to incubate and develop the hydrogen industry.
- 02 Establish an economic development plan that outlines the opportunities and actions required to accelerate growth of New Brunswick's industrial base with a focus on:
 - Critical minerals
 - Energy resource development
 - Development of SMR technology
 - Clean manufacturing
 - Natural gas and LNG
- 03 Encourage the establishment of a provincial energy cluster to drive collaboration, investment and growth across the entire energy ecosystem.



Regulatory Reform

As the entire energy market changes with new technologies, energy sources, generation strategies and microgrids, regulations need to be modernized. Our goal is to ensure our province is competitive, responsive and viewed as the place of choice to conduct business.

- 01 Complete legislative changes that are needed to facilitate the energy transition and drive clean energy development:
 - *Electricity Act*
 - *Pipeline Act, 2015*
 - *Gas Distribution Act, 1999*
- 02 We know we have exceptional wind resources on land and offshore. To further encourage development, we will establish a regime for offshore wind projects, aiming for completion in 2024.
- 03 Streamline the environmental approval process for new clean energy projects, working in concert with the federal government when needed, to find ways to move projects more quickly without compromising the integrity of the existing regulations and processes.

3.3 A PLAN THAT DELIVERS

Our energy roadmap clearly outlines our path forward to 2035 for New Brunswickers. Understanding that there will be ongoing changes in policy, regulations, technology, and markets as we work towards our 2035 energy objectives, this plan is intended to be a living document that will require regular reviews and updates as required. This plan will:



Address climate change and, when combined with other actions, will dramatically lower GHG emissions by up to 43 per cent from today to 2035.



Provide New Brunswickers with long-term energy security and capacity to facilitate significant economic growth.



Establish a clear path-forward on wind power and solar energy development and the role they will play as we grow renewables.



Build on our long history of nuclear expertise, leverage new SMR technology to grow our baseload power to meet increasing demand, and to use this technology to help decarbonize industry globally.



Identify and unlock the incredible natural resources we have and the potential they present when developed to drive our economy and help reduce or eliminate GHGs in our province, the region and the world.



Facilitate New Brunswick to become a major leader in the hydrogen industry.



Present significant opportunities for our First Nations communities to participate and prosper in this energy transition.



Ensure New Brunswick is cost competitive and that energy is affordable for all New Brunswickers through commitments from our government.

This strategy and the assumptions used to develop it are based on the best current available information and obviously subject to change. It is intended that this strategy be a living document that will require regular reviews and updates to reflect new information and any changes to the regulatory environment both provincial and federal or technology advancements that may cause the province to re-evaluate its approach.

**Together, let's work to Power our Economy
and the World with Clean Energy.**

