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IMPLICATIONS FOR ATLANTIC CANADA'S ECONOMY IN THE PURSUIT OF NET-ZERO EMISSIONS

Where Do We Go From Here?

Atlantic Economic Council

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The Atlantic Economic Council is the source for independent research, providing the insights and ideas that are vital to supporting a healthy, inclusive and sustainable Atlantic Canadian economy.

IMPLICATIONS FOR ATLANTIC CANADA'S ECONOMY
IN THE PURSUIT OF NET-ZERO EMISSIONS

Where Do We Go From Here?

Where we stand today in the shift to net-zero emissions

The federal government committed to reduce the country's greenhouse gas emissions to net-zero by 2050. Several provinces have also committed to a net-zero target, including all four in Atlantic Canada. Reaching this goal will require a major economic transformation. It will reshape company operations, investment flows and household financial decisions. Businesses and communities need to understand the transition's impacts so they can seize opportunities and manage risks.

The Atlantic Economic Council undertook a three-year research series to examine how the shift to net-zero will affect Atlantic Canada's economy. We explored this issue from many angles. Some reports focused on key industries in the region, such as oil and agriculture. Others analyzed major sources of emissions, like transportation and electricity, or highlighted opportunities tied to clean energy. No other research organization has tackled climate mitigation with such breadth from an Atlantic and economic perspective. Through this work, we raised awareness of the coming economic transition and provided analysis to guide business and government decision-making.

Our research remains relevant amid ongoing economic and policy uncertainty. Shifting trade dynamics, rising geopolitical tensions, and weakening climate efforts by some countries and companies may be slowing global progress toward net-zero. Still, many parts of the world continue to pursue a lower-emissions future.

This final report in our net-zero series synthesizes key findings in a Q&A format. It presents an overall assessment of the main economic considerations and implications for Atlantic provinces. Ongoing research, stakeholder engagement and strategy updates will be essential to advance decarbonization while minimizing uncertainty and risks.

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The big questions about the transition

Understanding the transition

What does "net-zero" emissions mean?
Net-zero emissions means that an economy needs to offset greenhouse gas emissions that are produced by actions that remove the same amount of emissions from the atmosphere. Emissions can be offset by natural carbon sinks, such as forests, or technological solutions like direct air capture.

Why have many governments worldwide set 2050 targets for achieving net-zero emissions?
Most climate experts agree that global warming beyond 2°C of pre-industrial levels would drastically affect ecosystems and living conditions. The United Nations is calling for countries to reach net-zero greenhouse gas emissions by 2050 to limit global warming. Canada legislated its 2050 net-zero commitment in 2021.

What is the economic rationale for setting net-zero targets?
Pursuing net-zero emissions helps manage growing economic risks from climate change, such as disruptions to infrastructure and supply chains. It also helps us create opportunities in developing clean technologies and remain competitive as some trading partners, investors and businesses prioritize high environmental standards.

How does climate adaptation relate to the net-zero transition?
Net-zero policies aim to decrease emissions to limit climate change. Adaptation focuses on adjusting to climate impacts that are occurring or expected. Some climate impacts are irreversible due to past emissions, and it is unknown whether we will reach net-zero emissions globally. Adaptation policies are needed alongside mitigation to help cope with these challenges.

Emissions reduction framework

Is Canada on track to achieve the net-zero by 2050 goal?

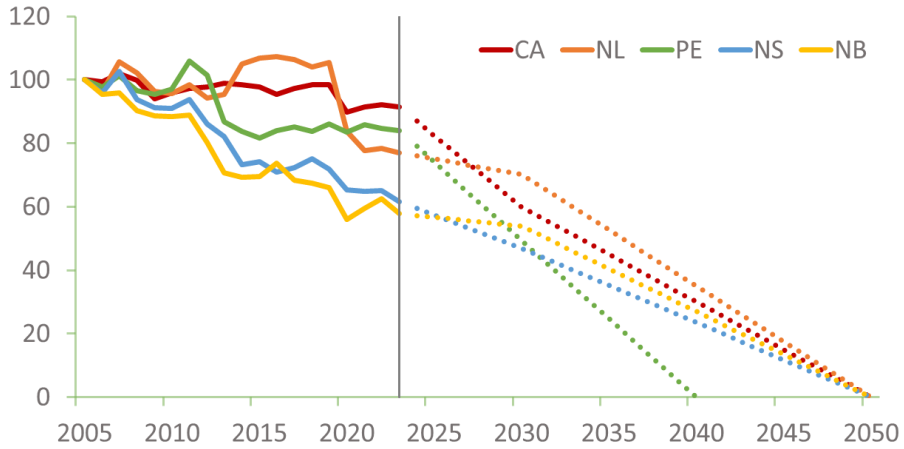
The net-zero target requires a massive reduction in current emissions at a faster pace than recently observed. Some provinces are further along than others. New Brunswick had the largest emissions decrease in our region from 2005-2023 at 42%.

Are current government actions enough to drive long-term emissions reductions in Canada?

The federal government has implemented many climate regulations, tax incentives and funding programs. Some are economy-wide, like the Clean Fuel Regulations and Low Carbon Economy Fund. Others are sectoral, such as the Electric Vehicle Availability Standard and Clean Electricity Regulations. Provinces have introduced measures too. But current climate plans mainly target near-term goals. Detailed, long-term policies and programs are needed for net-zero by 2050. Regulatory certainty is key for businesses and households to invest in green technologies.

Major emissions reductions required to meet net-zero goal

Emissions level (Indexed 2005 = 100)



Note: Dotted line is a linear decrease in emissions to current 2030 and net-zero emissions targets. Historical data are direct emissions; 2050 is net emissions.
Source: Environment and Climate Change Canada: National Inventory Report

Does a consumer carbon tax reduce emissions?

A consumer carbon tax can be an effective tool to encourage individuals to, for example, drive less or switch to electric heat. But its effectiveness depends on whether the tax is high enough and on the availability of eco-friendly alternatives. Upfront costs for electric vehicles (EVs) remain high, EV charging infrastructure is limited and electric home heating systems are not accessible nationwide. The federal government removed the consumer carbon tax, effective April 2025, after it was in place for six years.

How much spending is needed to reach the net-zero goal?

Canada's public and private sectors need to collectively invest $125 billion to $140 billion per year to reach net-zero by 2050, according to the 2022 federal budget. The current investment range stated in the budget is $15 billion to $25 billion annually. At the same time, net-zero inaction comes with a high and growing price tag. Climate experts warn that disaster recovery costs will rise significantly if global emissions continue to climb. Unfortunately, no recent studies provide reliable estimates of adaptation costs by province.

Considerations for small- to medium-sized enterprises (SMES)

How should SMEs prepare for net-zero?

SMEs should start by identifying their sources of energy use and emissions. This will help reveal low-cost process or behavioural changes to reduce energy consumption or improve energy efficiency. Some businesses will also need to invest in technologies to further decrease emissions – for example, industrial equipment or EVs.

What barriers do SMEs face in adopting clean technologies, and how can they overcome them?

SMEs face many barriers such as limited cash flow, competing investment priorities, and lack of time and technical knowledge. Overcoming these barriers requires coordinated efforts from governments, businesses and industry associations. Some solutions include improving awareness of financial supports, streamlining access to government funding, and expanding the green job labour supply.

Industry and innovation

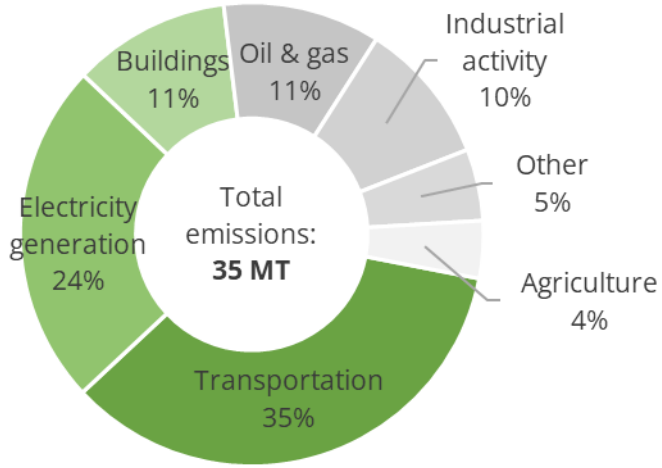
Do we have all the clean technologies we need to achieve net-zero by 2050?

The full suite of technologies needed to meet the net-zero goal has yet to be developed and scaled. The emissions reduction potential of many emerging solutions remains uncertain. A few emerging technologies being explored in our region are carbon capture and storage, batteries, hydrogen and small modular reactors.

Which Atlantic industries face significant risks from the transition?

Five sectors represent 90% of Atlantic Canada's business emissions: electricity, manufacturing, mining and oil, other primary industries, and transportation. They contribute over half the region's economic output and 43% of total jobs. Certain provinces have high-emitting industries with uncertain decarbonization paths, such as offshore oil in Newfoundland and Labrador, oil refining in New Brunswick, and agriculture in Prince Edward Island. Governments are addressing some economic risks by funding green initiatives and supporting workforce development.

70% of Atlantic emissions in 2023 came from three sources



Note: Only New Brunswick and Newfoundland and Labrador have oil and gas sector emissions. MT = megatonnes.
Source: Environment and Climate Change Canada: National Inventory Report

Which Atlantic industries face significant economic opportunities from the transition?

Industries supporting the development of clean energy projects like offshore wind, hydrogen and small modular reactors stand to benefit greatly. The mining industry is positioned to grow as increased exploration and production of critical minerals is needed for clean energy technologies and infrastructure. The construction industry faces high labour demand to support major projects and building retrofits across the region.

Major emitting sector: transportation

Are we on track to having sufficient charging stations for widespread adoption of light-duty EVs?

Most charging is done at home as Atlantic drivers typically drive far less than average 380-kilometer range of an EV. Still, more public chargers are needed for longer trips and overnight travel. Dunsky estimates that all provinces need to significantly scale up public chargers to support greater EV growth over the next couple decades.

How affordable are EVs compared to gas-powered vehicles?

The higher upfront cost of EVs remains a key barrier to adoption, though prices are trending down as demand softens and inventories increase. EVs have lower operating costs than gas vehicles and, according to the Parliamentary Budget Officer, this results in a lower total cost of ownership over time.

What is the best solution to decarbonize hard-to-electrify modes of transport?

Heavy trucks, trains, planes and marine vessels are currently difficult to electrify due to battery weight, limited range and a lack of charging infrastructure. Cleaner fuels, like biofuels and hydrogen, are the primary near-term solutions to reduce emissions from these modes. However, decarbonization remains very challenging, with barriers including the high cost and limited availability of cleaner fuels and the technologies needed to use them.

Light-duty vehicles are the top contributor to transport emissions

Share of transportation sector emissions, 2023 (%)

	CA	ATL	NL	PE	NS	NB
Light-duty vehicles	42	51	41	59	55	55
Medium- and heavy-duty vehicles	21	16	12	11	17	18
Marine	2	10	16	9	8	7
Aviation	4	5	7	4	5	3
Railways	3	2	3	0	1	2

Note: Off-road and pipeline transportation emissions are excluded from the table.
Source: Environment and Climate Change Canada: National Inventory Report

Major emitting sector: electricity

What key changes are expected in Atlantic Canada's electricity mix by 2050 to meet rising demand?

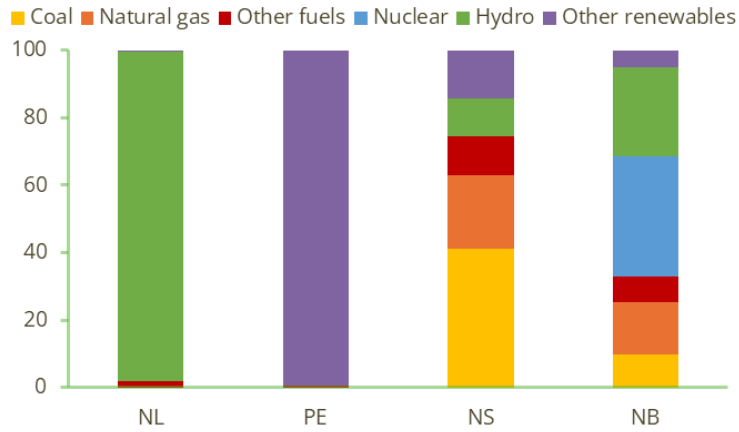
The Canada Energy Regulator projects our region's annual electricity demand will grow over 60% from 2021-2050 – equivalent to adding about five Muskrat Falls. Atlantic utilities expect renewable energy, particularly wind, to become more important energy sources during this period. New Brunswick and Nova Scotia will likely see the biggest shifts in their electricity mixes as they phase out coal power.

What are the implications of more variable renewable generation on grid reliability and resilience?

More wind and solar generation can pose reliability challenges due to their variable output. Atlantic utilities are managing these challenges through ways such as scaling up battery storage, upgrading grid infrastructure and expanding interprovincial transmission. The Clean Electricity Regulations contain exceptions to help utilities meet peak demand without being non-compliant. Natural gas is much less emissions-intensive than coal or oil and can serve as a dispatchable backup source, helping to integrate renewables and manage peak demand.

Electricity generation mix varies widely across our region

Electricity generation, 2023 (% of total)



Note: These data include in-province generation only. Other fuels are refined petroleum products, petroleum coke, biomass and fuels not easily categorized. Other renewables are wind, tidal and solar.

Source: Environment and Climate Change Canada: National Inventory Report

How might the transition impact electricity prices and energy affordability in our region?

Utilities are investing in clean electricity projects to meet rising demand and comply with net-zero regulations. The full cost of the electricity transformation is uncertain. These investments often come with large price tags, which could lead to moderate power rate increases to help recoup costs. At the same time, overall energy bills may fall by switching from fossil fuels in vehicles and buildings to electricity. High upfront costs, like for electric vehicles or heat pumps, can be a barrier to achieving these potential energy savings.

Major emitting sector: buildings

What role do electric heating systems play in reducing emissions from buildings?
Heat pumps with electric backup are generally considered the ideal solution to decarbonize building heating. Heat pumps are also the lowest-cost heating system for many Canadian households. However, high upfront costs can deter households that do not need to replace their existing systems yet.

How much retrofitting is needed to achieve net-zero by 2050 and what is a main barrier to get there?
Pembina Institute estimates that 41,000 residential units and 2 million square meters of commercial space in Atlantic Canada must be retrofitted annually until 2040. A recent report indicates annual residential retrofits fall way below this annual figure. A major barrier to scaling up is the shortage of skilled construction workers.

Do net-zero ready buildings cost more than traditional buildings?
Constructing net-zero ready buildings tends to cost more upfront due to higher material costs and additional labour requirements. However, the incremental cost of constructing an energy efficient building is usually lower than the cost of energy retrofits. These buildings also provide long-term savings through lower energy bills over their entire lifetime.

Looking ahead: What might be next

While our net-zero reports addressed numerous issues, many complex questions remain. How do we reduce emissions in sectors that are difficult or expensive to decarbonize without economic disruption? What roles will emerging climate technologies play? How should can we make it easier for SMEs and households to cut their emissions?

Clean energy investments, falling EV prices and growing demand for low-carbon products have supported the transition. But high interest rates, supply chain disruptions and policy uncertainty may have slowed momentum. Much of the progress to date has come from early-stage measures. Meeting Canada's 2050 goal will require major technology advances and more interprovincial collaboration.

It is important to reduce emissions in ways that foster economic growth. Economic activity is becoming less emissions-intensive, which raises a key question: Should we focus more on emissions per unit of activity when measuring progress in certain industries? Growth opportunities could also emerge by developing clean, export-oriented industries that reduce emissions abroad.

This shift can feel overwhelming for many SMEs. Climate technologies and policies are evolving, with no one-size-fits-all solution. Net-zero is just one of many operational pressures. Still, opportunities exist. Energy efficiency can lower costs and some businesses may find innovative ways to contribute to the clean economy. The transition is not solely government driven. Many business partners, customers and investors value sustainability.

However, not all countries are pursuing net-zero by 2050 – including major emitters like the United States, China and India. Canada accounts for just 1.4% of global emissions, so our actions have limited global impact. This makes climate adaptation even more important. Atlantic Canada needs a clearer view of which communities and infrastructure are most vulnerable to climate impacts. Planning ahead can reduce the long-term costs of inaction.

The pursuit of net-zero emissions by 2050 remains underway in Canada. Continued research, collaboration and planning will be essential to help Atlantic provinces navigate the path forward.

Key takeaways from our net-zero research series

Governments

- **Provide clear, long-term climate policy direction.** Transparent emissions reduction pathways and realistic timelines to 2050 – paired with regular progress updates – will help businesses, households and investors navigate uncertainty and plan ahead.
- **Maintain a clear and predictable regulatory environment.** This will support timely business decisions and long-term investment planning. Federal and provincial regulations should be aligned to prevent duplication or conflicts, which will reduce compliance burdens and improve regulatory certainty.
- **Accelerate approvals for clean energy and infrastructure projects.** These projects will help the region meet rising electricity demand, achieve decarbonization goals and capitalize on clean energy opportunities. Streamlined, coordinated permitting processes across governments will reduce delays and increase investor confidence. Timely infrastructure development is also essential to support compliance with climate regulations, like the Clean Electricity Regulations and federal EV mandate.
- **Support the decarbonization of SMEs.** Improve awareness of financial supports, reduce administrative burdens to access them, and ensure available programs are flexible and tailored to SME needs.
- **Work with high-emitting industries to smooth their transition.** This includes addressing technological, regulatory and economic barriers to decarbonization. Collaboration helps mitigate economic disruption while supporting innovation and competitiveness.
- **Ensure a comprehensive net-zero workforce strategy is in place**. This includes projecting future labour demand, assessing skills gaps, and funding upskilling initiatives and skilled trades programs. Working with education providers to expand programs for high-demand occupations is imperative.

Businesses

- **Understand how climate change and policies affect your business.** Government climate measures and physical climate risks are evolving. Industry associations and chambers of commerce can guide businesses to resources that will help them make informed operational and investment decisions.
- **Engage with business partners to evaluate how their climate plans could affect you.** Assess whether emissions reduction efforts by suppliers and logistics partners could impact pricing, product availability or expectations for your business to cut emissions as part of a greener supply chain.
- **Measure, change and potentially invest to decrease emissions.** Start by identifying energy use and emissions sources. Adopt low-cost operational changes where possible. Explore clean technologies that can offer significant emissions reduction.
- **Examine ways to reduce energy consumption and use energy more efficiently**. This could include off-peak power usage, generating your own clean power, choosing more energy efficient equipment and training staff to conserve energy.
- **Explore financial supports to lower emissions and improve energy efficiency.** Reach out to your industry association, provincial government or the Atlantic Canada Opportunities Agency to identify available programs. Talk to your financial institution to learn about financing options for green investments.
- **Position your business to take advantage of emerging clean growth opportunities.** Leverage your networks to understand where demand is growing for low-carbon products and services. This includes trade opportunities with countries seeking green products and services. Look for ways to innovate, qualify for green procurement contracts or participate in clean energy and retrofit supply chains.

Appendix: Council reports by net-zero theme

Report title	Understanding the transition	Emissions reduction framework	Industry and innovation	Major emitting sectors:		
				Transport	Electricity	Buildings
An Overview of Atlantic Canada's Coming Economic Transition	✓					
Adapting to Climate Change is Critical for a Resilient Atlantic Economy	✓	✓				
Atlantic Canada's Emissions Reduction Challenge: Navigating the Economic Risks	✓	✓	✓			
Atlantic Canada's Emissions Reduction Challenge: Assessing the Plan		✓	✓			
The Economics of Greening Your Business			✓			
What is the Future of Oil Refining in Atlantic Canada			✓			
How Can We Reduce Agriculture Emissions from the Ground Up?			✓			

Report title	Understanding the transition	Emissions reduction framework	Industry and innovation	Major emitting sectors:		
				Transport	Electricity	Buildings
How Does Offshore Oil Development Align with the Net-Zero Objective?			✓			
Economic Opportunities with Existing Clean Energy Technologies			✓		✓	
Economic Opportunities with Emerging Clean Energy Technologies			✓		✓	
Why is Energy so Important to our Net-Zero Transition?			✓		✓	
Laying the Foundation for Net-Zero Buildings			✓			✓
Shifting Gears Toward an EV Future				✓		
The Long Haul to Clean Commercial Transportation				✓		
Overcoming Obstacles to a Cleaner and Bigger Electricity System					✓	

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MOST RECENT REPORTS IN THIS SERIES

- > Shifting Gears Toward an Electric Vehicle Future
- > Adapting to Climate Change is Critical for a Resilient Atlantic Canada Economy
- > The Long Haul to Clean Commercial Transportation

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