

# Greening Canada: Transforming the Nation's Energy Landscape

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## Issue

As one of the top 10 global greenhouse gas emitters (Friedrich et al. 2023), Canada is a large contributor to climate change. Concurrently, the window of opportunity to reduce emissions and meet its 2030 climate targets is rapidly closing. With the energy sector being the country's largest source of carbon emissions (Environment and Climate Change Canada [ECCC] 2023), Canada must urgently act toward a net-zero industrial transformation to facilitate a smooth green transition.

## Background

### What is a Green Transition?

Currently on track to surpass 4.4 degrees of atmospheric warming by the end of the century (Calvin et al. 2023), the world urgently needs to reduce carbon emissions and decarbonize energy systems to secure a livable climate. A green transition involves shifting from fossil fuel-based energy sources such as coal, oil and natural gas to sustainable and renewable alternatives like solar, wind, hydroelectric, biomass and geothermal energy (Terämä n.d.).

The energy sector faces increasing threats from technological advances that reduce fossil fuel use, shifts in global markets, divestments and a growing reluctance from capital markets to invest in oil and gas holdings. Arguing for a future surge in demand for Canada's high-cost oil resources seems increasingly impractical. While the abrupt end of the oil and gas sector may not be imminent, a plausible scenario is emerging where a significant portion of Canada's oil and gas assets may become

non-economic, leading to stranded fossil fuel resources and decreased competitiveness on the global stage. This scenario suggests a steep decline in the economic value of Canada's fossil fuel resources and operational assets over time. Consequently, envisioning a future of zero reliance on fossil fuels is necessary and inevitable (Nathwani and Fitz-Gerald 2021).

## Global Efforts

On a global level, the United Nations Framework Convention on Climate Change (UNFCCC) serves as the primary platform for climate initiatives. Built upon its principles, the Paris Agreement, adopted in 2016 by over 195 countries, outlines nationally determined contributions (NDCs) that focus on reducing greenhouse gas emissions and adapting to climate change impacts. Despite widespread participation, many nations struggle to meet their NDC targets, highlighting the insufficiency of current commitments to limit global warming to below 1.5 degrees (Calvin et al. 2023).

The urgency for rapid decarbonization and robust climate action is growing. During the recent UNFCCC Conference of Parties (COP28), participating countries made a significant stride by collectively agreeing to transition away from fossil fuels, marking a pivotal moment towards impactful climate measures that acknowledge the imperative for an energy shift.

On an international scale, Canada stands as the world's fourth-largest fossil fuel exporter and exhibits the highest per capita greenhouse gas emissions among developed nations, despite having a relatively small population

(Government of Canada 2020). Within the Group of Seven (G7), Canada has shown the least progress in emissions reduction since 1990 (Office of the Auditor General of Canada 2023).

Canada's commitments during COP28 entail considerable pledges, including allocating over US\$67 million to support developing nations, fostering partnerships with Indigenous communities, investing in clean energy technologies and critical minerals, and bolstering infrastructure to be more sustainable and resilient. Furthermore, Canada has introduced economic incentives to curb methane emissions from beef cattle production (Government of Canada 2023a, 28).

### Domestic Efforts

Canada aims to have affordable, reliable, and sustainable energy, achieving net-zero emissions by 2050 (Office of the Auditor General of Canada 2021). This long-term goal is facilitated by a short-term target of a commitment to reduce greenhouse gas emissions by 40–45 percent below 2005 levels by 2030. Despite some progress, Canada's emissions have increased by more than 20 percent since 1990 (ECCC 2022b). This means that most reductions must occur in the years ahead to meet the 2030 target.

Canada's 2030 Emissions Reduction Plan aims to reduce emissions from the oil and gas sector by 31 percent from the 2005 level by 2030. To reach this goal, among various initiatives, Canada has proposed clean fuel regulations, launched an Emissions Reduction Fund of CDN\$750 million, initiated an Energy Innovation Program, invested in carbon capture utilization and storage technology, and committed to eliminate inefficient fossil fuel subsidies. The government has also committed to reducing oil and gas methane emissions by at least 75 percent below the 2012 level by 2030 (ibid. 2022a).

Furthermore, as a part of the federal government's Strategic Innovation Fund, it has allocated CDN\$100 million to the Clean Resource Innovation Network to accelerate the development and adoption of innovative technologies and processes to lower the oil and gas industry's environmental impacts. Despite all these efforts, in 2030, the transportation and oil and gas sectors are projected to remain Canada's largest emitters. In addition, more recently, Canada proposed a 2023 regulatory framework to cap oil and gas sector greenhouse gas emissions, which suggests reducing emissions from the sector through a "national emission cap-and-trade system" (ibid. 2023). These efforts illustrate a move toward decarbonizing the oil and gas sector. However, despite these measures, meeting national climate action targets seems unlikely.

## Canada's Strengths

### Clean Electricity Landscape

Canada's electricity generation has the lowest emissions among countries worldwide, with 83 percent of electricity generated in Canada identified as "non-emitting," including 68 percent from renewables and 15 percent from nuclear (Government of Canada 2022).

### Nuclear and Small Modular Reactors (SMRs)

Nuclear energy stands as a strategic asset for Canada. Canada's nuclear sector is well-positioned to create jobs, develop intellectual property and establish robust supply chains, all while supporting the country's climate change initiatives and clean energy goals. Additionally, it facilitates meaningful discussions with Indigenous communities regarding energy solutions for remote areas. SMRs in Canada offer versatile applications, addressing energy needs for on-grid systems, heavy industries such as mining and isolated communities. They also stimulate regional growth through advancements in manufacturing and nuclear supply chain services. With decades of expertise in nurturing and deploying supply chains and national laboratories, Canada is among the few countries with comprehensive capabilities spanning the entire nuclear lifecycle — from mining and plant construction to operation and waste management (Natural Resources Canada [NRC] 2018).

### Critical Minerals Hub

Critical minerals serve as the foundation for the green and digital economy, playing a pivotal role in essential products such as mobile phones, solar panels, electric vehicle batteries, and medical applications. Currently, the Canadian industry produces 21 of the 31 minerals and metals identified by Canada's Critical Minerals List (Government of Canada 2023b). By developing critical mineral value chains, Canada can expand to further its position as a front-line actor in critical mineral extraction to undergird the rising green economy.

## Canada's Challenges

### Canada's Climate Finance Lag

The race to secure global investments for Canada's net-zero transition is accelerating more rapidly than anticipated. To match the worldwide move towards clean energy, Canada needs over CDN\$80 billion annually in new investments, predominantly from the private sector (Arnold and Leech

2023). However, financing this transition has become more challenging for Canada due to the U.S. Inflation Reduction Act, which promises attractive returns for investors in the United States (ibid.). Recognizing the role of climate in organizing and guiding the financial system to align with climate goals, all other G7 and Group of 20 (G20) countries have established a Climate Investment Taxonomy Framework (ibid.). Canada, however, remains the last to adopt such a taxonomy, which could enhance its climate policies, including regulations and carbon pricing (ibid.). These taxonomies provide a standardized, science-based method to identify projects that support the energy transition, helping to counteract misinformation and greenwashing in climate finance. They ensure that investment is directed toward essential projects such as renewables and clean hydrogen (ibid.).

### Reliance on Natural Resources

Abundant with natural resources, Canada mainly relies on massive resource extraction for export (Carter 2020). Today, Canada has an average GDP per capita of US\$55,522, making it a high-income country (World Bank Data 2022), where natural resources account for 19.2 percent of nominal GDP, and the energy sector directly contributes 8.9 percent (NRC 2022). While these natural resources have resulted in economic benefits for Canada, the continued growth of the oil and gas sector creates significant challenges for decarbonization and a net-zero future. Like many other facets of Canada's policy landscape, Canada's climate policy is characterized by regionalism: control over natural resources is mainly within provincial jurisdiction (Carter 2020). This demarcation of control allows certain provinces, primarily Alberta, Saskatchewan, Newfoundland and Labrador, to encourage fossil fuel production without federal impediment, leading to a federal-provincial divide (ibid.). However, as a high-income country and one of the world's largest fossil fuel producers, Canada is responsible for pursuing swift decarbonization strategies and a green industrial future.

### Violations of Indigenous Rights

Canada, existing on Indigenous land, has a responsibility to respect the rights of Indigenous people, as articulated by Section 35 of the Canadian Constitution Act of 1982 (Centre for Constitutional Studies n.d.) and the United Nations Declaration on the Rights of Indigenous Peoples, which articulates Indigenous peoples' rights to free, prior and informed consent for land use (Article 19). The Office of the Auditor General of Canada notes that Indigenous groups such as the Assembly of First Nations did not feel adequately consulted within Canada's green transition

strategies (Office of the Auditor General 2023). Canada has a history of violating Indigenous people's land rights, even for clean energy projects such as the case of Manitoba Hydro, which displaced many Indigenous peoples (Byrne, Glover and Martinez 2017). While Canada does have the Indigenous Leadership Fund that provides funding for Indigenous-led climate action, the government could do more to advance Indigenous leadership and adopt Indigenous approaches in the energy transition.

### Other Key Players

Coordinating on federal plans for industrial decarbonization, the NRC, the ECCC, the Ministry of Innovation, Science and Economic Development Canada and Canada Energy Regulator are the most significant federal bodies to consider. In addition to this wide array of federal government departments and stakeholders as well as the provincial energy ministries, nationwide industry associations such as the Canadian Association of Petroleum Producers are vital to consider in decarbonization plans, as their membership accounts for 80 percent of Canada's natural gas and crude oil production (Chen 2022).

Similarly, policy approaches must consider the expertise of civil society actors such as the Canadian Renewable Energy Association and Indigenous Clean Energy (ICE), who research and advocate for renewable solutions to energy challenges. Given Canada's colonial past and present, organizations such as ICE, Indigenous Climate Action, the Assembly of First Nations, and Canadian Council for Aboriginal Business are also essential partners for decarbonization policy making as they represent some of the most climate-vulnerable groups in Canada and advocate for justice-based solutions that center equity and Indigenous empowerment.

### Recommendations

**Power Innovation and Capitalize on Patent Potential for SMR and Battery Technologies.** Canada is uniquely positioned to become a leader in green technologies such as SMRs and advanced battery systems. The country has all the required resources, including essential minerals, advanced research and lab facilities, and a globally respected brand. To capitalize on this opportunity, Canada should fast-track the commercialization of these green energy technologies and leverage their patent potential by providing tailored financial support to companies actively working to bring these technologies to the market. Additionally, Canada needs to focus on overcoming early adopter risks and barriers to entry by co-financing pilot

projects and demonstration plants, which can showcase these technologies' practical benefits and operational viability. While Canada's recently launched International Technology Pilot and Demonstration Program aligns with this vision to a certain level, its limitations, such as excluding nuclear tech and strict eligibility criteria, alongside a modest funding cap of \$300,000 (Government of Canada 2024), risk undermining Canada's true cleantech innovation potential, which needs to be addressed.

**Accelerate the Finalization and Implementation of the Climate Investment Taxonomy Framework.** On March 3, 2023, the Sustainable Finance Action Council of Canada published its "Taxonomy Roadmap Report," which outlines a Canadian Green and Transition Financial Taxonomy Framework. This framework has the endorsement of the country's 25 largest financial institutions (Canadian Climate Institute 2023). The framework aims to correctly direct investments and ensure that the country remains a competitive player in the global transition to net-zero emissions, and leverages global capital to finance its green transition by categorizing investments under green, transition and non-eligible labels (Arnold and Leech 2023). While the framework sounds promising, it is still not finalized. Considering that Canada has already been too late in implementing this framework being the last among G7 and G20 countries, regulators and government, in collaboration with the financial sector, must move quickly to turn this framework into a practical, independent and science-based tool to evaluate projects and portfolios.

**Transform Canada's Net-Zero Advisory Body.** To address crucial aspects of achieving a net-zero target, such as securing a provincial-federal consensus, emphasizing grassroots involvement, and ensuring sustained investment in energy development, we recommend transforming Canada's Net-Zero Advisory Body into an Independent National Commission. The proposed changes include expanding the body's membership to include a representative from each province for better coordination between federal and provincial levels and enhancing its role as a liaison with governments. Additionally, we recommend that the Commission reports directly to the Canadian government, increasing transparency and autonomy in advising on emission targets and strategies to reach them, thus improving its efficacy in guiding the transition towards net-zero emissions by 2050.

**Incorporate an Indigenous Climate Lens and Prioritize Localized Solutions.** We also recommend that the ECCC and all Canadian federal bodies dealing with green transition initiatives adopt an Indigenous Climate Lens

mirroring the Assembly of First Nations (AFN) National Climate Strategy. AFN's Climate Lens eschews the dichotomy between mitigation and adaptation initiatives that ignore the complex interconnectedness of human relationships with the earth and leave room for Indigenous communities and vulnerable populations to be left behind. Canada's green transition plans should emphasize localized energy systems and self-sufficient communities, moving away from fossil-fuel-driven extractive industry to meet Canada's energy demands. Incorporating an Indigenous Climate Lens encourages questioning taken-for-granted assumptions about capitalism and the ability of market-based mechanisms to resolve a crisis of colonialism. To incorporate this lens into policy making and planning, the ECCC, NRC and provincial and regional governments should take leadership from AFN and engage in more meaningful consultation with Indigenous groups, centre the rights of Indigenous peoples and land defenders before approving any industrial projects, and prioritize funding for localized renewable energy solutions. All industrial projects that receive federal funding should abide by this perspective and sufficiently collaborate with local Indigenous communities.

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## Acknowledgments

The authors would like to thank Hope Tracey and Tejas Rao for their guidance and mentorship throughout the development of this brief.

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