

Canada's Electrification Advantage in the Race to Net-Zero:

Five catalysts to accelerate
business electrification

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**Canada's Electrification Advantage in the Race to Net-Zero:
Five catalysts to accelerate business electrification**

May 2022

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Citation: Electrifying Canada. (2022). *Canada's electrification advantage in the race to net-zero: Five catalysts to accelerate business electrification*. International Institute for Sustainable Development. <https://www.iisd.org/system/files/2022-05/canada-electrification-advantage-net-zero-en.pdf>



About Electrifying Canada

Electrifying Canada is a business-led task force aiming to accelerate electrification across Canada to reach net-zero by 2050. As business leaders, we are eager to collaborate with government, Indigenous, and civil society leaders to translate electrification ambition into action. The Electrifying Canada task force is affiliated with the Energy Transitions Commission and funded by its founding members. Learn more at electrifyingcanada.ca.

Members:



Advisors:



Energy
Transitions
Commission

About the Research

Research for the Electrifying Canada task force is provided by Dunsky Energy + Climate Advisors. Dunsky's team of nearly 50 specialists across the buildings, transportation, industry, and energy supply sectors is proud to serve as the task force's research arm.

This report is a collective view of the Electrifying Canada task force and may not represent the individual viewpoints of members and/or their respective organizations.



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1. From Net-Zero Ambition to Electrification Action

1.1 Net-Zero, New Normal

As the impacts of a changing climate hit home and the economic opportunities of climate action become increasingly evident, tackling climate change has become a top priority in our boardrooms. And we aren't alone.

In corporate boardrooms and the corridors of political power in Canada and around the world, business and political leaders are stepping up. Today, about 90% of the world's economy is covered by net-zero emissions

90% of the world's economy is covered by net-zero emissions targets.

targets (Net Zero Tracker, 2022). This commitment is backstopped by the nearly 500 global financial services firms that have agreed to align USD 130 trillion—roughly 40% of the world's financial assets—with the Paris Agreement's goal of limiting global warming to 1.5°C (United Nations, 2021).

While there is no silver bullet climate solution and multiple technologies and approaches will be necessary, clean electrification—substituting fossil fuels with clean electricity—has consistently been identified as offering the most affordable, reliable, and efficient way to decarbonize vast swaths of the economy. The recently published *Canadian Energy Outlook 2021 – Horizon 2060*, produced by the Institut de l'énergie Trottier, sums it up plainly: “Massive electrification is required to reach net zero” (Langlois-Bertrand et al., 2021, p. 149). Accompanying the net-zero emissions imperative is what Mark Carney, the former governor of both the Bank of Canada and the Bank of England and now UN Special Envoy for Climate Action and Finance, has described as “the greatest commercial opportunity of our age” (Bloomberg News, 2020). The flip side of this is the risk of inaction: failure to do our part to tackle climate change resulting in businesses and an economy that are rendered less competitive.

Beyond the economic opportunity, action to align the Canadian economy with net-zero also offers a significant opportunity to advance Indigenous reconciliation and economic self-determination.

While the federal government is taking significant steps on both climate action and reconciliation, efforts vary considerably across the provinces, with some stepping up and leading while others lag. Ultimately, delivering on these priorities will require all hands on deck.

Reaching Canada's target of net-zero emissions by 2050 while sustaining economic prosperity requires major action—and there is no time to waste, which is why we have convened



Electrifying Canada, a business-led task force aimed at accelerating electrification across Canada. Our members come from a range of organizations—electricity and resource producers, finance players, First Nations business champions, environmental philanthropists, and non-governmental organizations—each playing a different role in the energy transition and bringing a unique viewpoint to inform our work.

This report and the accompanying sector-specific briefs are the results of our first phase of work toward developing an actionable and comprehensive framework to electrify large shares of the economy.

To inform this work, we have tapped into academic and corporate knowledge about both the role of electrification and barriers to it in Canada.

We completed a meta-review of existing research related to decarbonization, electrification, and net-zero pathways to understand the current state of play, as well as a gap analysis of Canada's electrification landscape relative to leading international jurisdictions. This research was complemented by interviews with 20 corporate and Indigenous leaders from across key sectors and regions of Canada.

From this research, we have identified targeted opportunities to accelerate the electrification of Canadian businesses, as well as the key barriers that are inhibiting the pace and scale of progress needed to get on a trajectory to net-zero. These opportunities are described generally below and in more detail in the four accompanying sector briefs for (1) scaling up clean electricity, (2) heating commercial and institutional buildings, (3) electrifying medium- and heavy-duty vehicles, and (4) electrifying the manufacturing, mining, and construction industries.

1.2 Electrification's Scale Up Challenge

As the International Energy Agency (2022) recently noted, “compared with other countries that are more reliant on fossil fuels for electricity generation, **Canada's mostly decarbonised electricity system represents an early advantage for greater electrification of other fossil fuel-dominated sectors**” (p. 151). At over 80% non-emitting (Canada Energy Regulator, 2022), Canada has a relatively clean power grid—but with a federal government commitment to achieving a net-zero emitting electricity system by 2035 (Environment and Climate Change Canada, 2022), we will need to move swiftly to replace the polluting 20% with new, clean generation.

While cleaning up the electricity system will have its challenges, the much bigger challenge is the need to significantly increase the role of

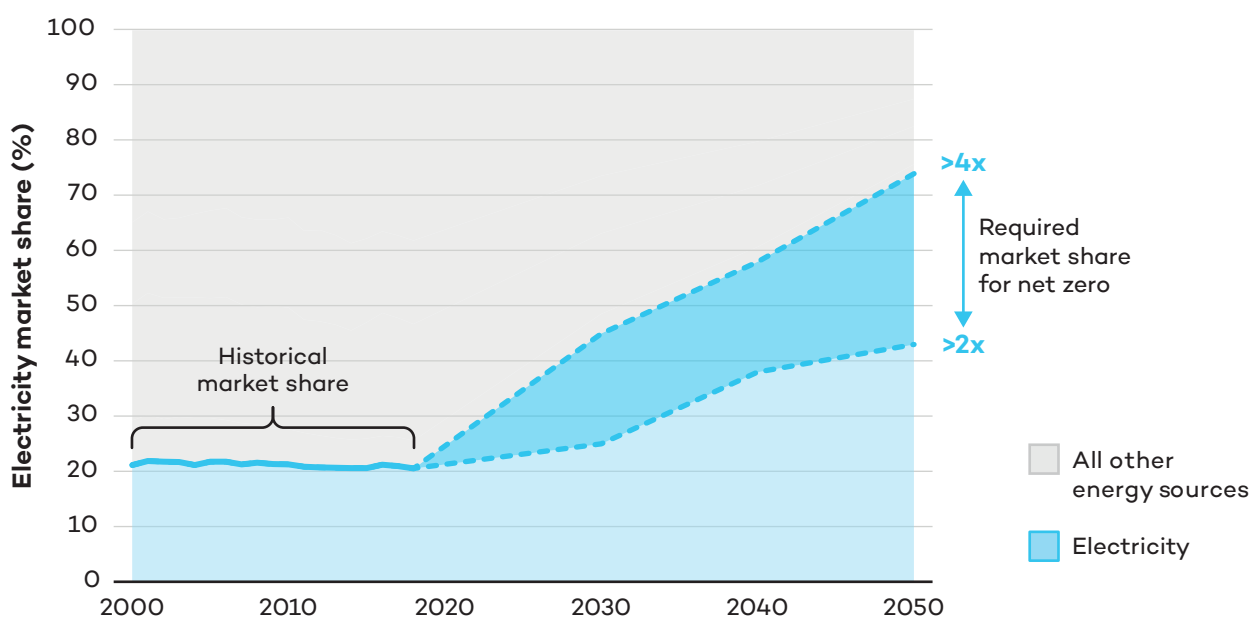
The much bigger challenge is the need to significantly increase the role of electricity in our overall energy system.



electricity in our overall energy system as the economy becomes increasingly electrified on the path to net-zero by 2050. This challenge is critical because the electrification of high-emitting sectors offers highly effective emissions reductions.

The Energy Transitions Commission, with which our task force is affiliated, recently published a report that found that the growing electrification of buildings, transportation, and industry could lead to electricity meeting 70% of global energy demand by 2050, versus 20% today (Energy Transitions Commission, 2021). Across numerous studies, this holds true for Canada as well, as significant electrification will lead electricity's share of final energy demand to double or triple within the next 30 years (Figure 1), substituting fossil fuels and contributing to significant greenhouse gas (GHG) emission reductions in the process (International Energy Agency, 2021; Langlois-Bertrand et al., 2021). In fact, in almost all studies, clean electrification and efficiency are the single largest source of emissions reductions.

Figure 1. Growth in electricity's share of final energy demand to achieve net-zero by 2050



Source: Produced by Dunskey Energy + Climate Advisors for Electrifying Canada, 2022. Data source for historical market shares: Natural Resources Canada, 2020. Data sources for net-zero pathways: Bataille et al., 2015; Canadian Climate Institute, 2021; Electric Power Research Institute, 2021; Langlois-Bertrand et al., 2021.

In Canada, the new power-generating capacity required for electrification requires major expansion of the electricity system across the country, including both new generation projects and transmission linking them to where the power is needed.



This cannot happen without Indigenous communities at the table from the beginning, as net-zero projects will be located on Indigenous lands, and net-zero policies will directly impact Indigenous rights and title. Indigenous communities have long understood the urgency of climate change and spoken out, drawing upon the first-hand experience of its impacts. While historically excluded from project development and ownership, Indigenous communities have become leaders in developing clean energy projects as proponents and through equity partnerships. Consequently, Indigenous leadership and knowledge in sustainability, land management, and clean power projects will prove essential to achieving net-zero in a manner that respects Indigenous rights and ensures that projects benefit from free, prior, and informed consent, as set out in the *Declaration on the Rights of Indigenous Peoples*, and advances reconciliation (Von der Porten et al., 2022).

Spotlight: The First Nations Major Projects Coalition (FNMPC) is one of many Indigenous-led organizations leading the way in developing this new approach

The FNMPC, an Electrifying Canada founding member, is working to advance the capacity needs of its members in the broad areas of economic participation and environmental stewardship. Through this work, the FNMPC is creating pathways to reconciliation by advancing opportunities for First Nations to obtain ownership stakes in major projects that run through their territories by advocating for sovereign loan guarantees and establishing economic models that would increase Indigenous participation in major developments (First Nations Major Projects Coalition, 2022).

The FNMPC is supporting the development of the Tu-Deh-Kah Geothermal Project, a 7–15 MW plant that will displace natural gas generation with zero-carbon electricity while repurposing gas infrastructure. This is one of many Indigenous-owned and led projects that has received project development advisory services from FNMPC, including support to secure funding (Gilpin, 2021).

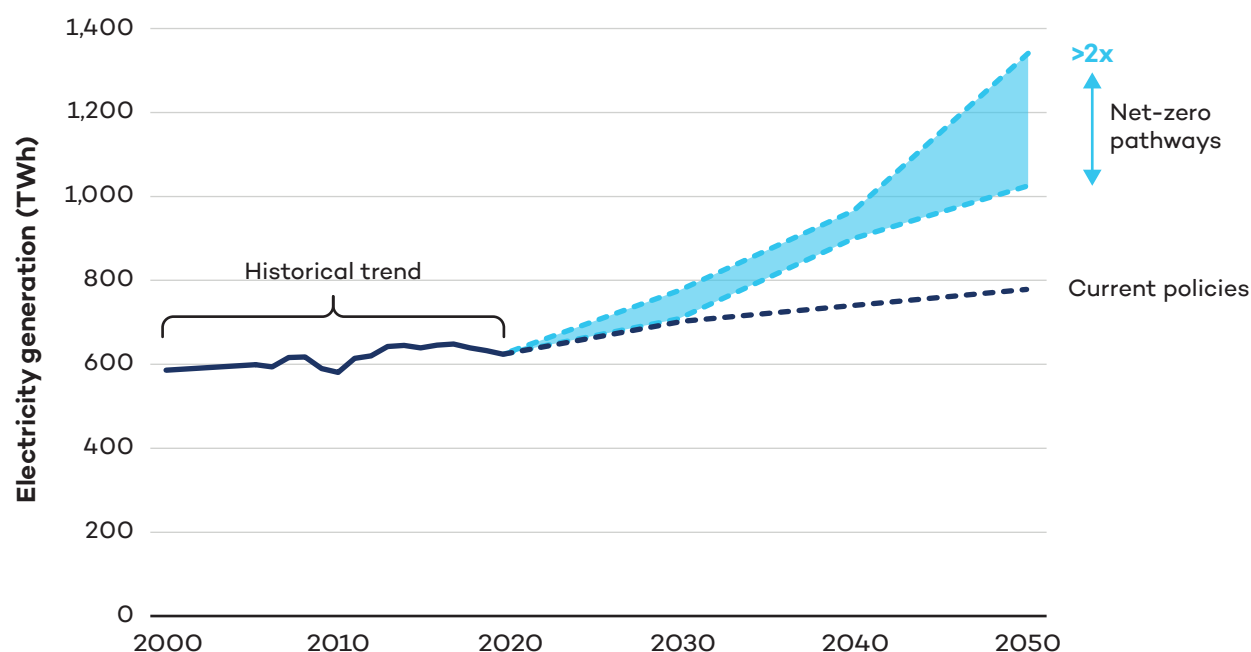
As businesses and consumers increasingly electrify heating, transportation, and industry, there will be a corresponding increase in clean electricity demand that will need to be met when and where it is needed. Across a range of studies, it is clear that **electrification will require at least a doubling of Canada's total clean electricity supply** (Figure 2). About half of that increase will be driven by additional demand from buildings, a third from transport, and 10%–15% from the industrial sector (Langlois-Bertrand et al., 2021)—if energy productivity gains in buildings and industry are realized, including in those already electrified.

While we have an abundance of clean and renewable energy resources, technologies, and companies that we can tap to deliver this supply, the current reality is that almost all utilities and their electricity system planners are not currently moving quickly enough to secure the clean



power we will need to electrify substantial portions of our economy. Refer to our *Scaling Up Clean Electricity* brief for additional detail.

Figure 2. Growth in clean electricity generation required to reach economy-wide net-zero¹



Source: Produced by Dunskey Energy + Climate Advisors for Electrifying Canada, 2022. Data source for historical and current policies: Canada Energy Regulator, 2022. Data sources for net-zero pathways: Electric Power Research Institute, 2021; Langlois-Bertrand et al., 2021.

1.3 The Economic Case for Clean Electrification

There is a growing assortment of new and modified technologies and approaches that are enabling us to switch from burning fossil fuels to plugging in to clean electricity. Many Canadian companies are stepping up to offer and/or adopt clean electrification solutions, targeting early opportunities to reduce both emissions and operating costs.

In addition to electrifying existing business operations, Canada has an opportunity to attract new businesses and investment. Increasingly, **companies around the world are looking for low-cost, low-carbon regions to locate their operations, and Canada has a significant**

¹ Some economic optimization studies assume that all cost-effective energy efficiency gains will be realized, which would reduce the amount of generation required. However, as only a portion of the efficiency potential is likely to be realized, much more generation will be required than is shown in these economic optimization pathways. Still, because of these efficiency gains, as well as the fact that heat pumps and electric motors are about three times more efficient than the fossil fuel combustion heating equipment and motors they are replacing, the required increase in electricity generation (>2x) is somewhat lower than the required increase in electricity market share (>2–3x, Figure 1).



opportunity to leverage our clean electricity advantage—and electrification potential—to attract these companies and their investment capital.

For example, in announcing its intention to invest CAD 5 billion to establish the first large-scale, domestic electric vehicle battery manufacturing facility in Canada, Stellantis N.V. and LG Energy Solutions referenced Canada's "leadership in the generation of electricity from renewable sources" (Stellantis N.V., 2022). Similarly, carbon-free aluminum produced by ELYSIS using hydropower at its Industrial Research and Development Centre in Quebec is finding its way into Apple iPhones as the company looks to reduce the carbon intensity of its supply chain (Apple Inc., 2022).

For Indigenous and other communities in every part of Canada, electrification will create new jobs ranging from infrastructure projects to produce and deliver more clean power to the supply chain that manufactures, sells, and installs electric vehicles, heating systems, and industrial processes for the emerging electrification services industry that will provide critical professional, technical, and financial support. This potential is significant: Clean Energy Canada (2021) forecasts that more than 200,000 new clean energy jobs will be created by 2030 under the federal government's 2019 climate plan. With the federal government's new, more ambitious 2022 Emissions Reduction Plan, the scale of this opportunity will be even greater.

More than 200,000 new clean energy jobs will be created by 2030.

But with other countries moving quickly to catch up, opportunities like those described above could prove fleeting. To build on Canada's clean electricity advantage, we must continue to clean up and quickly scale up clean electricity production in Canada while simultaneously taking action to electrify our buildings, transportation, and industrial sectors.

To successfully fulfill national and corporate climate commitments alike—and to enhance prosperity in the process—**we need a coordinated and deliberate effort to encourage and support clean electrification, with collaboration between business, Indigenous, and political leaders.** To inform this effort, the following section identifies targeted opportunities for Canadian businesses to electrify, as well as barriers that will need to be overcome to do so.



2. Electrification Barriers and Opportunities

2.1 Key Barriers to Business Electrification

Despite a clear value proposition—reduced GHG emissions and, in many cases, lower operating costs—**clean electrification is not yet happening at the pace and scale required**, in large part because private sector leaders are encountering barriers. Informed by our research and interviews, business leaders have identified three broad, crosscutting barriers to electrification:

1. **A chicken-or-egg dilemma**—or in electricity terms, a “plug-or-socket” dilemma: what comes first, new electricity demand (the plug) or new electricity supply (the socket)? In some parts of Canada, prospective consumers who are seeking to electrify and electricity utilities and system planners are each typically waiting for the other to move first. As a result, neither is moving. For both, uncertainty around whether—and when—the other will follow through presents a material risk of wasted resources. Meanwhile, in other parts of Canada, there is an abundance of new demand identified, but the supply must catch up and faces long lead times. Electrification will be stalled or stunted unless clarity and commitment to plan for both supply and demand are aligned.
2. **Uncertainty around policy direction:** Canadian businesses are interested in taking climate action but are holding back on major investments until the long-term policy signals are more certain. These signals include promised regulations that have yet to be implemented but also existing programs and policies that are not considered “sticky” by corporate Canada. For example, the federal carbon price is heavily discounted by many businesses to account for the risk that the price will not rise as quickly as planned or could be removed altogether by a future government.
3. **The allure of “wild cards” over “safe bets”** (as defined by the Canadian Climate Institute [Dion et al., 2021]): Perhaps because it is a “safe bet,” electrification is not garnering the near-term attention and support required to fulfill its potential and start delivering emissions reductions. Instead, political attention and public investment are largely distracted by and focused on “wild card” technologies that, while needed to help reach the final stages of the transition toward net-zero, are both more uncertain and incapable of delivering the bulk of near- to mid-term emissions reductions.

Unlike other sectors, Canada's electricity sector operates in provincially defined and tightly regulated markets, with varying degrees of vertical integration and private sector participation. In addition, potential beneficiaries of electrification are spread across multiple sectors and business types. This fragmentation contributes to another overarching challenge that spans all three of the broad barriers described above: the absence of a clear champion for clean electrification.















2.2 Business Priorities for Accelerating Electrification

As a task force, we have chosen to focus on opportunities—identified by leading businesses—that offer significant electrification and emission-reduction potential but that face significant barriers. As depicted in Table 1,² **we have prioritized sectors that offer high electrification growth potential but face a lack of clarity around policy or technological direction.** On this basis, priority opportunities to accelerate business electrification include

- Scaling up clean electricity and the electrification of medium- and heavy-duty vehicles
- Commercial and institutional buildings
- The manufacturing, mining, and construction industries.

Table 1. Opportunities targeted by the Electrifying Canada task force to support and accelerate the electrification of Canadian businesses

Sector	Subsector	Policy direction	Technological direction
 Power	Scale up of clean electricity		
 Buildings	Commercial and institutional heating		
 Transport	Medium- and heavy-duty fleets		
 Industry	Manufacturing, mining, and construction		



Clear direction



Partial direction



Unclear direction

Each of these sectors is explored in more detail in the four accompanying briefs, which identify sector-specific barriers and solutions.

² These areas are in addition to the important work already being done on grid decarbonization and the electrification of light-duty vehicles, residential heating, and other industries.



3. Five Catalysts to Accelerate Electrification

Canada has a transformational opportunity to meet our net-zero target by leveraging the competitive advantage offered by our clean electricity. However, our research finds that while Canada has huge opportunities and significant advantages, we also face a significant risk: complacency. **Without clear direction, proactive planning, and bold decisions, we will not be successful in overcoming the barriers to electrification** identified above. Failure to do so means losing out on our competitive advantage, vastly increasing transition costs and risks, and foregoing significant opportunities.

Figure 3. Five catalysts to accelerate electrification





It is clear that whether we succeed or fail is up to us. Achieving electrification at the pace and scale needed requires the proactive and collaborative efforts of all stakeholders—electricity producers, end-users, regulators, and policy-makers—across the electricity value chain. Meeting Canada's net-zero target is a significant challenge, and clean electrification

is the single most valuable tool we have to reduce emissions. That is why we, as leaders from the nation's private sector, have identified five evidence-based catalysts to initiate and enable electrification (Figure 3), which are described thoroughly in this section. The accompanying briefs provide more detailed, sector-specific recommendations for each of the five catalysts.

Achieving electrification at the pace and scale needed requires the proactive and collaborative efforts of all stakeholders.

3.1 Act to Develop Plans and Deploy Near-Term Electrification Projects



Take action to support the early deployment of electrified solutions, learning by doing, and translating climate action targets into electrification plans, pilots, and projects that prove out approaches to support scaled up investment.

Why?

Many businesses have long-term climate targets, but few have paired these targets with near-term plans to practically achieve emission reductions.

Call to Action: Businesses must develop near-term company plans, pilots, and projects to electrify operations.

Canadian companies, led by members of the Electrifying Canada task force, must translate long-term corporate climate action targets into electrification plans and near-term learn-by-doing pilots.

This effort can be supported by developing and enhancing internal expertise, as well as leveraging external technical and financial expertise, which will drive the market and help develop the electrification service industry.

Spotlight: Teck heavy-duty mining fleet electrification

In 2020, Teck committed to a long-term target to reach net-zero emissions across its mining operations by 2050 (Teck, 2022b) and translated this goal into near-term targets and actions. By 2025, Teck aims to achieve net-zero purchased electricity emissions and to displace 1,000 internal combustion engine vehicles with zero-emission vehicles (ZEVs) by 2025. By 2030, Teck aims to reduce the carbon intensity of its operations by 33% (Teck, 2021).



These near-term targets have created urgency for action. Electricity was identified as a key abatement opportunity for emissions associated with its transportation and stationary combustion and process needs. Teck has purchased electric pit buses for one site and is testing the world's first electric on-highway transport truck to haul copper concentrate (Teck, 2022c). These pilots are happening in concert with scoping, feasibility studies, and trials for further electric vehicle use, including an agreement to pilot and deploy 30 Caterpillar electric large haul trucks starting in 2027 (Teck, 2022a).

As Teck acts to decarbonize its operations, the available and forecasted supply of clean electricity is becoming an increasing barrier to the further electrification of its operations.

3.2 Empower Utility Climate Leadership Through Regulator and Utility Net-Zero Mandates



Fully embracing electrification's potential and enabling its role in cutting pollution will require modernizing the mandates of regulators, local and provincial utilities, system planners, and system operators to reflect the key role they will play in achieving net-zero and ensure utility plans and regulatory decisions are consistent with pathways to net-zero.

Why?

With a mandated focus on affordability and reliability, traditional utility regulation may consider but is not bound by climate targets when making decisions. The constraints of a relatively conservative, risk-averse regulated system limit the authority of utilities to proactively meet the needs of a rapidly decarbonizing economy while simultaneously prohibiting other actors from providing solutions where the utility may not be able to meet clean energy demand. In some jurisdictions, private clean electricity generators are ready to assist with electrification demand but face barriers related to electricity system planning and regulation. Further, electricity and natural gas are commonly siloed in regulations, which limits the potential to optimize economy-wide decarbonization across both the electricity and gas systems.

Call to Action: Provincial governments must embed net-zero objectives in regulator and utility mandates.

Provincial governments must modernize regulator and, where applicable, utility, system planner, and system operator mandates to require integrated decision making about provincial electricity and natural gas systems and their respective roles in achieving economy-wide net-zero.

This mandate should require that energy supplies, combined with demand management, are sufficient to support the complete decarbonization of end-uses at the lowest cost to ratepayers. This process should consider whether changes to monopoly rules are needed to allow end-users to access sufficient, emission-free electricity as early as possible in order to meet their climate goals.



Spotlight: Massachusetts regulator required to prioritize emission reductions

In 2021, Massachusetts enacted a new climate law focused on net-zero by 2050. Under the law, the Department of Public Utilities (the regulator for investor-owned utilities) and utilities are required to prioritize emissions reductions (Massachusetts General Laws ch. 8., 2021). The regulator is now legally required to consider how a utility project or decision will reduce emissions, where previously it was only required to consider safety, reliability, and affordability (Cronin, 2021). Similar mandates were given to regulators in Maine, Maryland, and Oregon, though they must only consider how utilities will help achieve state emission targets, not require them to do so (Exec. Order No. 20-04., 2021; Maine Stat., No. 1682, 2021; Maryland Code, Com. Law. Ch. 615, 2021).

In Canada, regulators largely remain guided by non-climate priorities. However, in British Columbia, the GHG Reduction Regulation has empowered utilities to spend ratepayer funds on emission-reduction activities. As of 2020, public utilities can invest in electrification programs that provide financial and other supports to switch customers from higher-GHG energy sources to electricity. This regulation does not align with net-zero targets but highlights a recent effort to broaden utility mandates (Government of British Columbia, 2022).

3.3 Align Utility Planning and Growth With Net-Zero Pathways to Ensure Ample Clean Power Supply



Align and optimize utility planning with net-zero pathways to ensure all customers have enough clean power where they need it and when they need it, enabling them to increasingly electrify.

Why?

On the supply side, the governing bodies of utilities and planning authorities (which can include local, provincial, and Indigenous utilities; system planners; and system operators, depending on the jurisdiction) are increasingly aware of the need for vastly more power to achieve net-zero; however, their actual electricity resource plans have not caught up. For example, while decarbonization pathways suggest we will need at least 12%–25% more power by 2030, most utility plans currently fall far short (see our *Scaling Up Clean Electricity* brief), with many not crossing into that range until a full decade later.

According to the Canadian Energy Regulator (2022), utilities across Canada are collectively planning to grow electricity output by 40% by 2050. Meanwhile, net-zero pathways require growth of between 65% and 115% in absolute terms (see Figure 2). The gap could not be any clearer.



Call to Action: Governing bodies of utilities and planning authorities must proactively align plans and investments with economy-wide net-zero targets.

The governing bodies of utilities and planning authorities must focus planning and investments on aligning with pathways to net-zero. This shift allows utilities to expand their focus to grow in support of decarbonizing economy-wide energy use by increasing clean electrification—not solely maintaining and decarbonizing the existing electricity grid.

Spotlight: Hydro-Québec's new 5-year strategic plan puts a strong focus on electrification

Hydro-Québec, often viewed as having an abundance of available energy, recently received letters of intent from around 30 existing and potential large clients (>50 MW) looking to build or expand industrial plants and data centres (Jolicoeur, 2022). Combined, these sites would require over 10,000 MW of new power in the coming years, roughly one quarter of the utility's total installed capacity (Fillion, 2022). Like most utilities, Hydro-Québec did not plan for this, and as a result, it had no choice but to communicate to proponents that they should not assume that power would be available for their projects.

Hydro-Québec recently clarified its intentions when it published its 2022–2026 strategic plan, which emphasizes its role as a catalyst for economy-wide decarbonization and focuses the grid's build-out toward that goal. It prioritizes efficiency and peak demand management, plans near-term increases of generating capacity of 5,000 MW, and adds a clear long-term direction to increase generation by more than 50% by 2050 (Hydro-Québec, 2022) (in line with economy-wide net-zero modelling [Dunsky Energy + Climate Advisors, 2021]).

With this new commitment to boost supply, Hydro-Québec has aligned itself with a net-zero future.

3.4 Tilt the Playing Field to Provide the Certainty Needed to Drive Electrification



Facilitate greater investment certainty by regulating clear performance standards and guaranteeing a rising price on carbon pollution to drive down emissions from buildings, transportation, and industries over time. This must be accompanied by clear and corresponding timelines for scaling up clean electricity.

Why?

Performance-based standards in buildings can foster private sector innovation by defining the target, not prescribing the path, toward net-zero performance. The business case of building electrification itself is relatively poor from a customer's point of view, but it is vital to achieving net-zero targets. However, from society's perspective, electrification and efficiency measures



usually provide negative GHG abatement costs—in other words, net benefits to society. With clear performance standards, the private sector can determine the best pathway to meet them, driving local manufacturing and electrification services industries.

Electrifying transportation is currently a promising business case for many vehicle classes, but the pace of vehicle supply does not meet demand. A medium- and heavy-duty (MHDV) ZEV sales mandate would ensure the supply of vehicles, enabling emissions reductions. In its *2030 Emissions Reduction Plan*, the federal government has outlined its intention to require 35% zero-emission MHDV sales by 2030 and 100% by 2040 for a subset of vehicle types (Environment and Climate Change Canada, 2022).

Finally, there is uncertainty as to whether the federal price on carbon pollution will increase as scheduled to 2030 and whether the pricing system can withstand future changes in government. This presents a decision challenge for industries that require more certainty and risks operational decisions that lock in fossil fuel use for decades.

Call to Action: Set performance standards for commercial and institutional buildings, set ZEV mandates for MHDV vehicles, and backstop a rising carbon price to provide certainty for industry investments.

To improve investment certainty, provincial and federal governments must tilt the playing field toward net-zero in each sector by:

- **Setting building emissions performance standards.** These standards would set a limit on the emissions intensity of a building by floor area, which would decline over time. Additional details are provided in our brief on electrifying commercial and institutional buildings.
- **Setting a ZEV sales mandate for MHDV.** The federal government must follow through on this commitment, and provincial governments must set their own mandates. Additional details are provided in our brief on MHDV electrification.
- **Backstopping the carbon pollution pricing signal** by helping to develop or deliver a mechanism to provide assurances for future carbon price increases, effectively shifting the risk of lower carbon prices away from businesses. Additional details are provided in our [*Industrial Electrification*](#) brief.
- **Creating opportunities for Indigenous ownership** will help to accelerate electrification by de-risking projects and ensuring alignment with Indigenous rights and values.



Spotlight: Building performance standards in Canada's three largest cities

Montreal, Toronto, and Vancouver have committed to reducing building emissions by setting performance standards or retrofit codes. Reaching these standards does not necessarily require electrification—the low-carbon solution is at the discretion of the builder. However, electric heating systems, whether fully electric or hybrid, are typically the most cost-effective option.

The City of Montreal requires annual energy disclosure for all existing large commercial, institutional, and multi-residential buildings (City of Montreal, 2021a). The disclosure will be used to provide an emission rating and is planned to evolve to incorporate performance standards, targeting zero emissions for all buildings by 2040 (City of Montreal, 2022b). The cities of Toronto and Vancouver have performance requirements for all new building construction, setting a baseline for low-carbon performance that has increased in stringency over time (City of Toronto, 2022; City of Vancouver, 2022).

3.5 Finance Electrification Projects by Crowding in Private Investment



Channel interest in private investment through innovative public–private–Indigenous approaches to finance the doubling of electricity supply and associated electrification demand. These efforts should also recognize and replicate the current examples of private–Indigenous approaches that do not require public funding.

Why?

Electrification projects at the scale and pace needed to meet net-zero targets will require significant capital investment. These projects have different returns on investment, risks, and opportunities than traditional projects.

Public funds can be leveraged to mitigate some risk, but there are limitations to the scale of government investment to cover the incremental upfront costs for these electrification projects. Therefore, new approaches to financial sector deal preparation, analysis, and design are needed.

Call to Action: Develop innovative public–private–Indigenous financing initiatives.

Public and private financial institutions must develop financing initiatives to fund the grid build-out, as well as the investments needed for electrifying buildings, vehicle fleets, and industrial operations. Convening public, private, and Indigenous partners can support knowledge sharing on how to evaluate and finance new types of deals and address the barriers Indigenous groups face in achieving competitively priced sources of capital. This process can also support the co-development of new financial products that improve risk sharing between actors (e.g., using



public funds to mitigate some, but not all, project risk). This public investment, exemplified by the Canadian Infrastructure Bank, can leverage broader, long-term private investment.

Additionally, the federal government should consider channelling funding directly to provinces and territories, given their jurisdiction over electricity markets.

Spotlight: Innovative financing options in Canada

Electrification financing options vary widely in Canada based on the sector's current business case.

SOFIAC, a Quebec-based energy service company, offers retrofit financing and implementation. SOFIAC reduces project risk by leveraging public funds for incentives and project financing (e.g., Canadian Infrastructure Bank) and by aggregating retrofit projects (SOFIAC, 2021).

Innergex and Pituvik Landholding Corporation have a 50–50 equity partnership to develop a hydroelectric project, the first of its kind between an Inuit corporation and an independent power producer in Canada (Innergex, 2021). The partnership is constructing a 7.5 MW run-of-river facility near Inukjuak, Nunavik, in northern Quebec, replacing off-grid diesel generation. The clean generation project has a 40-year power purchase agreement with Hydro-Québec and is primarily financed through a private sector construction loan, with additional financing provided by the equity partners (Innergex, 2020). This project highlights a financing model example for challenging or novel grid expansion, but other approaches are also needed. Canada Grid and the Institute for Sustainable Finance are convening actors across the electricity and financing sectors to develop innovative solutions at the Macro-Grid Financing Roundtable, which will be held starting in April 2022.



4. Stepping Up for Electrification

Canada's clean electricity advantage offers unique potential to move quickly to electrify large swaths of the economy. In doing so, we can decarbonize and enhance the competitiveness of our economy as the world moves toward net-zero.

When announcing the release of the International Energy Agency's 2022 review of Canadian energy policy, Executive Director Fatih Birol highlighted how "Canada's wealth of clean electricity and its innovative spirit can help drive a secure and affordable transformation of its energy system and help realize its ambitious goals." Indeed, there's no doubt that Canada's goal of reaching net-zero carbon emissions by mid-century is a significant challenge. With its climate action efforts since 2015 and its recent Emissions Reduction Plan, the federal government has been doing the heavy lifting in developing policies and making investments that will cut carbon pollution. But provincial action is a patchwork, with many provinces—among them the largest GHG emitters—making relatively little effort or even rolling back policies while also challenging federal efforts. It is increasingly clear that if we are to capitalize on Canada's electrification potential, **we need more business, Indigenous, and political leaders to step up as climate action leaders and electrification champions.**

To do so, the International Energy Agency (2022) has recommended the "development of a comprehensive national electrification strategy that provides guidance to provinces and territories, given their own jurisdiction over electricity markets, and which reinforces the importance of strengthening interprovincial connectivity and system resilience." The five catalysts we have identified could serve as a starting point for such a strategy.

"Canada's wealth of clean electricity and its innovative spirit can help drive a secure and affordable transformation of its energy system and help realize its ambitious goals."

FATIH BIROL, EXECUTIVE DIRECTOR, IEA



Act to develop plans and deploy near-term electrification projects.

Empower utility climate leadership through regulator and utility net-zero mandates.

Align utility planning and growth with net-zero pathways to ensure ample clean power supply.

Tilt the playing field to provide the certainty needed to drive electrification.

Finance electrification projects by crowding in private investment.

While the federal government can play a role in developing a national electrification strategy, its implementation—and ultimate success—largely resides with the provinces, which have primary oversight for the electricity and energy systems more broadly. For this reason, we call on Canada's premiers—through the Council of the Federation—to spearhead the development and implementation of a national electrification strategy as a central element of achieving a prosperous and equitable net-zero economy. This strategy should then be reflected in provincial climate action plans, understanding that the optimal approach to electrification will vary from province to province.

We stand ready to support the development of a national electrification strategy as we move into the next phase of our collective effort to accelerate electrification in Canada. We can reach net-zero carbon emissions by mid-century, significantly increasing the chance of limiting global warming to 1.5°C. And we know that electrification is critical to getting us there—we have no time to waste.

We call on Canada's premiers—through the Council of the Federation—to spearhead the development and implementation of a national electrification strategy as a central element of achieving a prosperous and equitable net-zero economy.



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Annex 1. Electrifying Canada

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