

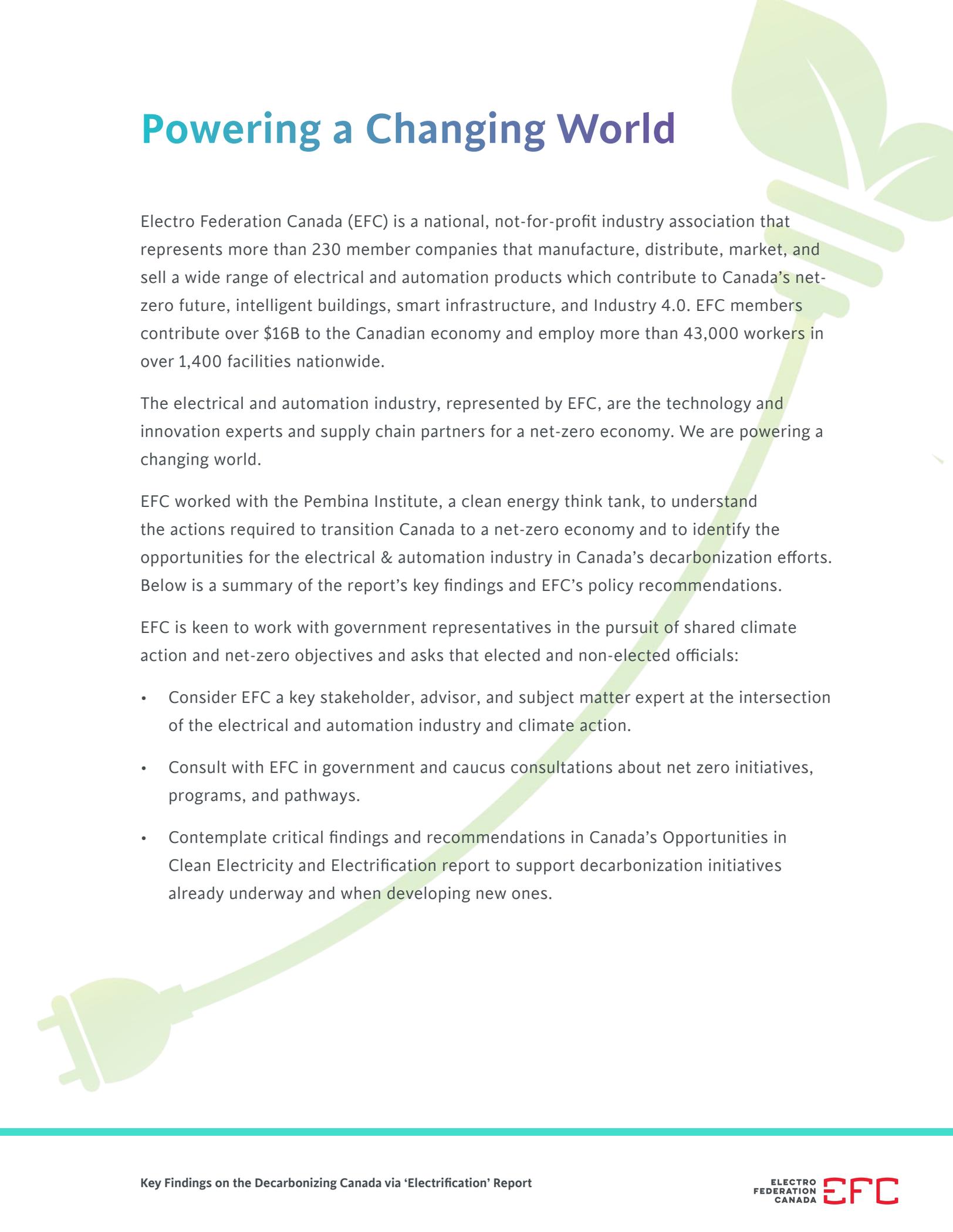


2023 Key Findings: Decarbonizing Canada via 'Electrification' Report

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Powering a Changing World



Electro Federation Canada (EFC) is a national, not-for-profit industry association that represents more than 230 member companies that manufacture, distribute, market, and sell a wide range of electrical and automation products which contribute to Canada's net-zero future, intelligent buildings, smart infrastructure, and Industry 4.0. EFC members contribute over \$16B to the Canadian economy and employ more than 43,000 workers in over 1,400 facilities nationwide.

The electrical and automation industry, represented by EFC, are the technology and innovation experts and supply chain partners for a net-zero economy. We are powering a changing world.

EFC worked with the Pembina Institute, a clean energy think tank, to understand the actions required to transition Canada to a net-zero economy and to identify the opportunities for the electrical & automation industry in Canada's decarbonization efforts. Below is a summary of the report's key findings and EFC's policy recommendations.

EFC is keen to work with government representatives in the pursuit of shared climate action and net-zero objectives and asks that elected and non-elected officials:

- Consider EFC a key stakeholder, advisor, and subject matter expert at the intersection of the electrical and automation industry and climate action.
- Consult with EFC in government and caucus consultations about net zero initiatives, programs, and pathways.
- Contemplate critical findings and recommendations in Canada's Opportunities in Clean Electricity and Electrification report to support decarbonization initiatives already underway and when developing new ones.

Decarbonizing Canada via Electrification Report

Key Findings

Emission reductions in the electricity, buildings, and transportation sectors, which collectively account for 45% of Canada's emissions, are critical:

- A **net-zero grid** requires physical electric infrastructure upgrades and the mass deployment of electrical and automation devices.
- Canada must **ramp up deep retrofits and fuel-switching** of building stock to 4.5% annually until 2040.
- To **scale electric vehicle adoption**, a significant expansion of electric vehicle charging infrastructure is required.

Policy Recommendations

- **Federal Funding Increase.** Current estimates of net-zero pathways suggest that approximately \$80 bn per year of public and private funding needs to be invested across the Canadian economy to meet de-carbonization goals.
- **Funding Programs and Tax Credits.** Remove barriers to government funding. Support programs like tax credits that are less onerous, more evenly distributed across eligible participants, and less exposed to political & budgetary cycles.
- **Harmonization of Standards.** Align standards nationally and internationally for the electricity, buildings, and transportation sector to support supply chains and makes products more costs effective.

Key Findings – Electricity Infrastructure



A net-zero grid is essential for achieving economy-wide net-zero targets. Achieving a net-zero grid will require physical electric infrastructure upgrades and the mass deployment of electrical devices.

Three key aspects to unlock the pathway to a decarbonized grid:

- Clean energy supply with rapid deployment of renewable energy and storage.
- More distributed energy resources and demand-side management opportunities are needed.
- Transmission and Distribution system networks need to be updated to optimize the performance of these technologies.

Policy Recommendations

- Implement a stringent Clean Electricity Regulation with enforcement.
- Clear carbon pricing with checks and balances to consider the economic and environmental impacts along the journey.
- Increased funding mechanisms to support the deployment of clean energy.
- Support the development of regional electricity transmission infrastructure.

Key Findings – Buildings



Canada needs to ramp up deep retrofits and fuel-switching to 4.5% each year of the existing building stock, or 600,000 homes and 750 million m² of commercial space, from now until 2040.

Canadian manufacturers, suppliers, designers, and builders are looking at a \$400 bn opportunity to retrofit and decarbonize Canada's buildings by 2040. The public investment necessary is \$10-15bn per year.

The need for building energy management systems is expanding beyond commercial and institutional spaces to homes and MURBs.

Homeowners adding EV charging and solar PV will require electrical service upgrades at the building and/or neighbourhood scale, especially when electrifying space and water heating.

Policy Recommendations

- Align model building and retrofit codes with net-zero emissions goals.
- Increase federal and provincial funding by 10-20 times for deep retrofits and electrification.
- Tie incentive and subsidy programs to net-zero emissions targets to discourage standalone energy efficiency measures and exclude like-for-like replacement of fossil fuel burning equipment.

- Utilize energy efficiency law to drive fuel switching to low carbon systems such as heat pumps and re-sistance heating.
- The promotion of resistance heating as a critical technology to meet climate, application, and cost considerations.
- Develop a comprehensive national deep retrofit market development strategy.
- Utilize industry standards to facilitate rapid adoption of net-zero-aligned innovations.
- Define electricity and natural gas energy resource plans to clarify the future energy mix in buildings.
- Demand-side management regulations must be refined to align with climate targets and energy plans.

Key Findings – Transportation



A significant expansion of electric vehicle charging infrastructure is required to scale electric vehicle adoption in line with Canada’s electrification targets.

- Public charging needs for light-duty vehicles (LDVs) – 830,000 stations by 2050
- Public charging needs for medium heavy-duty vehicles (MHDVs) – 40,000 stations by 2050
- Private charging needs for medium heavy-duty vehicles (MHDVs) – 337,000 (Level 2) and 87,000 (Level 3) by 2050

Estimated costs to build out charging infrastructure to meet targets:

- LDV charging network - \$20 bn over three decades.
- MHDV charging network - \$500M in 2025 and \$7 to \$13B by 2050.

As electric vehicle adoption increases, grid upgrade requirements will grow, especially in rural areas.

Policy Recommendations

- Create a long-term plan for EV charger buildout.
- Develop a national infrastructure deployment plan to align with EV targets.
- Develop interoperability standards to address the lack of integration across charge point providers.