

The impact of adopting leading Canadian electrification policies nationally

Summary

Electrification policies reduce greenhouse gas emissions by substituting fossil fuels with electricity while at the same time ensuring that electricity generation comes from low-emission sources. Clean Energy Canada identified leading provincial electrification policies, and was interested in understanding the implications of these policies being applied across the country. Using the CIMS energy-economy model, Navius determined that “scaling-up” these policies to a national level could reduce Canadian greenhouse gas emissions by 34 Mt CO₂e in 2030—closing 15% of the gap to Canada’s 2030 emissions target of 30% below 2005 levels.

What is electrification?

Electrification is the process of fuel switching to low-carbon electricity. Analysis suggests that electrification could account for over one quarter of the abatement required to achieve deep decarbonization in Canada.¹

Electrification can be accomplished through a variety of actions, such as:

- Replacing gasoline vehicles with plug-in electric vehicles.
- Switching from natural gas-fired space and water heating to electric heating.
- Using electricity instead of fossil fuels for industrial processes.

For fuel switching to electricity to successfully reduce emissions, electricity generation must be dominated by low-carbon supply options such as renewables, nuclear or fossil fuel power plants equipped with carbon capture and storage.

What are the leading electrification policies in Canada?

Clean Energy Canada identified several leading electrification policies that have been implemented or proposed by provincial governments (see Table 1). This study simulates the impact of these policies if they were applied nationally across all of Canada.

Table 1: Summary of leading Canadian electrification policies

Sector	Policy	As implemented or proposed in
Personal transport	Zero Emission Vehicle (ZEV) mandate	Québec
	Financial incentives for PEVs	Ontario
Residential buildings	Net zero carbon building code	Ontario
	Financial incentives for net-zero buildings	Québec & British Columbia
Electricity generation	Accelerated coal phase-out by 2030	Alberta
	Clean energy performance standard	British Columbia
Economy-wide	Carbon price	Alberta / British Columbia (price level) & Québec/Ontario (coverage)

¹ Bataille, C. et al., 2015, *Pathways to deep decarbonisation in Canada*, available [here](#).

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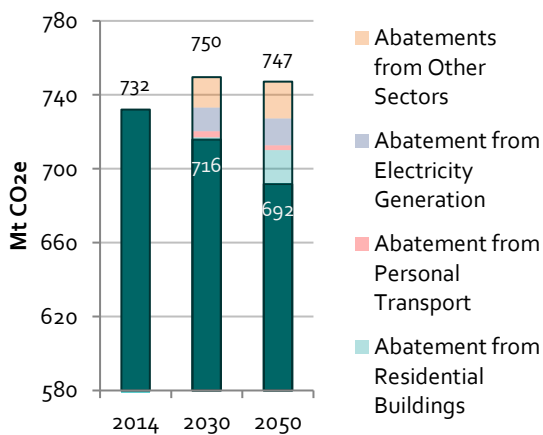
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How would implementing these policies nationally impact Canada's emissions?

If the leading provincial electrification policies were implemented across all of Canada, greenhouse gas emissions would be reduced by 34 Mt—from 750 Mt to 716 Mt—in 2030.

The policies reduce greenhouse gas emissions through two actions: (1) substituting fossil fuels with electricity, and (2) ensuring that electricity generation comes from low-emission sources.

Figure 1: Canada's national emissions forecast



Key policies targeting end-use electrification include:

- **Carbon price of \$30/t** (a reduction of 18.7 Mt annually in 2030). This policy achieves the greatest abatement because it is the only policy to target more than one sector of the economy.
- **Zero-carbon residential building code** (3.6 Mt abatement annually in 2035 rising to 15.7 Mt abatement in 2050). The building code requires new residential buildings to use zero-carbon space heating after 2030.
- **ZEV mandate** (2.5 Mt annually in 2030). The ZEV mandate reduces emissions by requiring at least 12% of new passenger light-duty vehicles sold in each province to be plug-in electric by 2025.

Further reductions from end-use electrification could be achieved by increasing the stringency of carbon pricing or developing policies that specifically target electrification in sectors not covered by the policies examined here (such as industry, commercial buildings and freight transport).

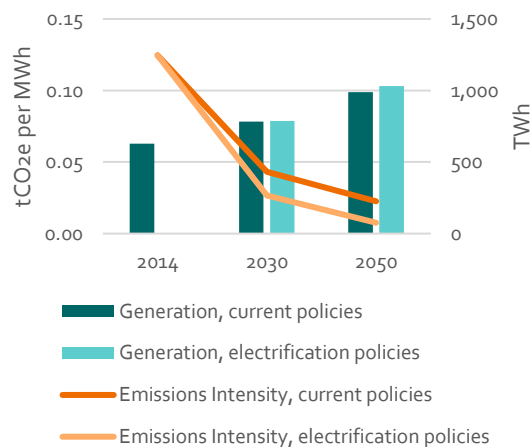
How does the electricity generation sector respond to the policies?

The policies virtually decarbonize Canada's electricity sector by banning most fossil fuel-fired electricity generation unless equipped with carbon capture.

Clean electricity policies complement the other policies by ensuring that low carbon electricity is available to meet the demand from efforts to electrify end-uses.

The policies accelerate two key trends of Canada's electricity sector, as shown in Figure 2. First, electricity consumption increases more quickly as demand sectors switch from fossil fuels to electricity to comply with the electrification policies. Second, the electricity sector decarbonizes more quickly and more completely.

Figure 2: Change in electricity generation and emissions



This study was commissioned and funded by Clean Energy Canada: www.cleanenergycanada.org.

The full study can be downloaded at www.NaviusResearch.com/publications.

For questions about this research or to inquire about custom analyses, please contact Noel Melton at Noel@NaviusResearch.com.