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ELECTRIFICATION IN CANADA

Presented by
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Electrification in Canada

Electrification refers to replacing technologies that use fossil fuels (coal, oil, and natural gas) with those that use electricity. Depending on the resources used to generate electricity, electrification can potentially reduce carbon dioxide (CO_2) emissions from the transportation, building, and industrial sectors. Addressing emissions from these sectors is crucial to decarbonizing the economy and mitigating climate change impacts. This overview examines how electrification can reduce emissions, explores the possibilities and challenges of electrification in various sectors, and discusses policy options to promote electrification.

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How Can Electrification Reduce Emissions?

In Canada, a significant portion of electricity is generated using zero-carbon sources such as hydroelectricity, nuclear energy, and renewables. Consequently, technologies that use electricity tend to have lower CO_2 emissions than those using fossil fuels directly. The electricity grid is expected to become even cleaner over time as policies aim to increase the amount of electricity generated by zero-carbon sources. Therefore, the benefits of electrification are likely to grow as electricity generation becomes less carbon-intensive.

Replacing fossil fuels with electricity in the transportation, building, and industrial sectors is one of the most viable options for decarbonization. While there are various methods to decarbonize the electricity sector, other sectors have fewer alternatives to significantly reduce emissions aside from electrification. For instance, alternative transportation fuels like biodiesel and ethanol are cleaner than gasoline but still emit CO_2 and other pollutants. Hydrogen, another alternative fuel, is expensive and requires electricity to produce. Transitioning to electric technologies, which emit no emissions at the point of use, would shift most emissions to the power sector. This shift allows policymakers to focus on decarbonizing the electrical grid, which might be more feasible than attempting to decarbonize each sector separately.

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Regional Variations in Electrification Benefits

Electrification benefits vary based on the resources used for electricity generation.

Emissions from electricity generation differ significantly across regions.

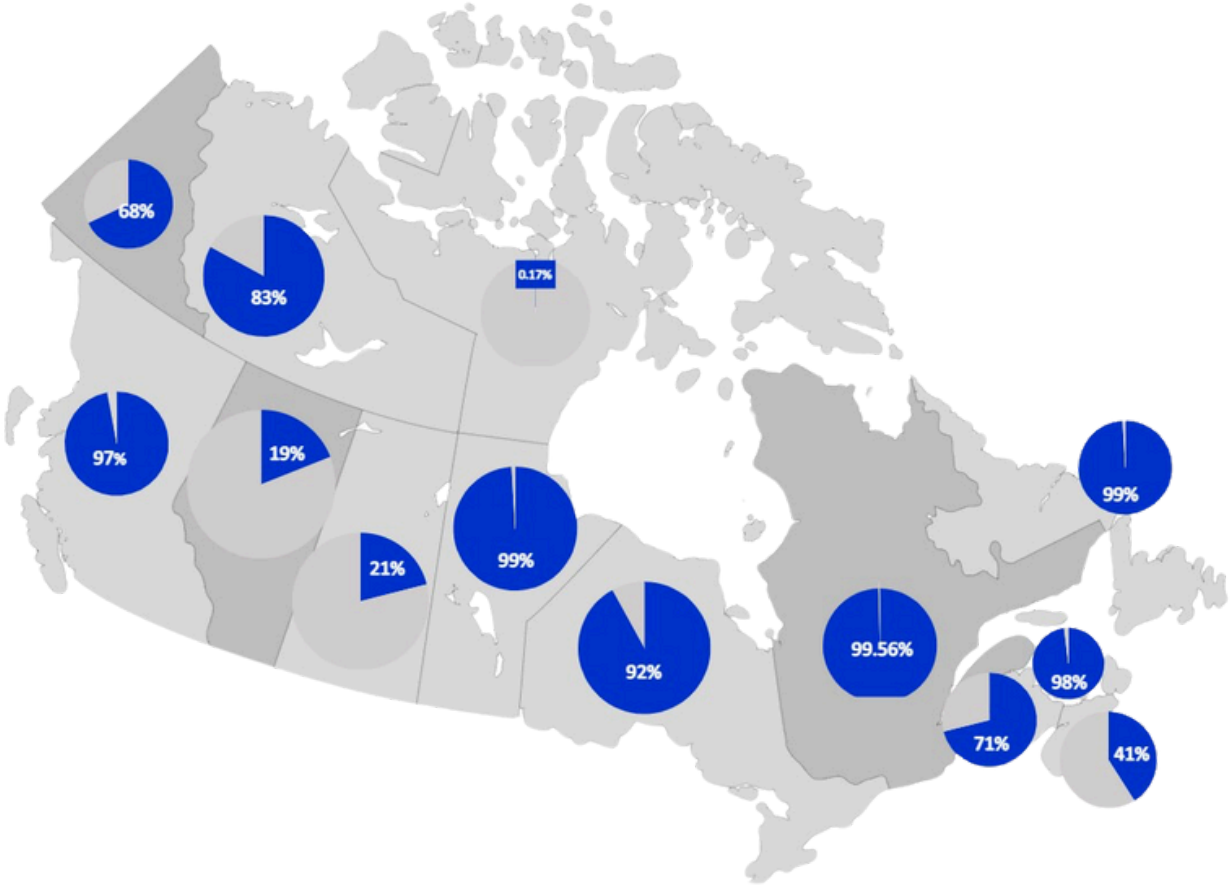
Regions with a higher proportion of zero-carbon resources benefit more from electrification.

Provinces like Quebec, which rely on hydropower, would see substantial benefits from electrification.

Regional Variations

Provinces that rely more on fossil fuels for electricity generation may experience fewer immediate benefits.

Benefits in fossil fuel-dependent regions could increase as the grid's resource mix evolves.



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Sectoral Differences in Electrification Potential

The potential for electrification varies widely across and within sectors. Some sectors already have commercially viable technologies, while others might face technological and economic challenges to electrify. Despite these challenges, electrification remains a critical strategy for reducing emissions and achieving climate goals.

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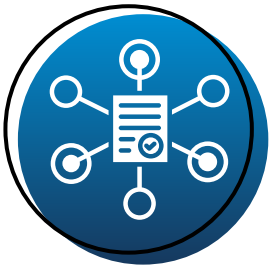
Canadian Electricity Advisory Council and Electrification

The Canadian Electricity Advisory Council plays a crucial role in supporting electrification efforts. By providing expert guidance and recommendations, the Council helps shape policies that promote the transition to electric technologies.

The Council's work focuses on several key areas:



Policy Development

Advises on regulatory frameworks and policies to encourage zero-carbon electricity generation and sector electrification.

Infrastructure Investment

Recommends investments in grid infrastructure to support increased electrification demand and renewable energy integration.

Innovation and Technology

Promotes R&D for new electric technologies to address technical and economic challenges of electrification.

Public Awareness

Raises awareness among stakeholders and the public about electrification benefits and opportunities.

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SGIN Energy Leadership Series

The SGIN Energy Leadership Series delivers accessible understandings concerning our continuing need to drive clean energy implementation and at and at scale. In this series our industry network of leaders share insights and understandings as to the major issues we face and break down the myths and noise that can be barriers to achieving clean beneficial energy for our subsequent generations.