



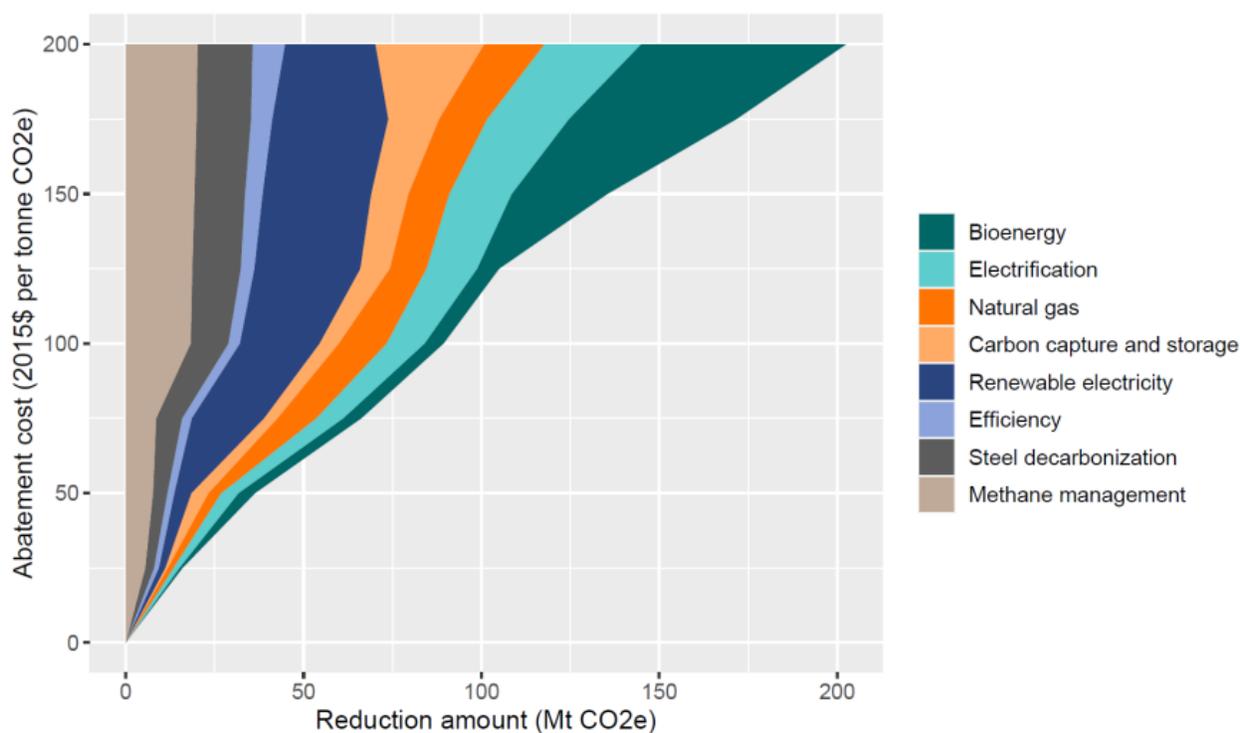
What are Canada’s most promising options for reducing greenhouse gas emissions?

Abatement cost curves answer this question and help direct policy efforts towards the technologies, fuels and actions that reduce emissions at the lowest cost.

Figure 1 presents an abatement cost curve for Canada, identifying the least cost options to achieve a given level of emissions reduction in 2030. Policy makers simply choose their desired level of abatement—and the cost curve reveals the options to achieve that objective!

The cost curve below reveals that the most economically efficient path to reducing Canada’s emissions involves a diversity of abatement actions. Nevertheless, the importance of different actions varies depending on the desired level of abatement. For example, policy makers wanting to achieve 100 Mt of abatement should focus on renewable electricity, fuel switching to natural gas and methane management. Those wishing to achieve 200 Mt of abatement should also emphasize bioenergy, electrification and carbon capture and storage.

Figure 1: Canada’s greenhouse gas abatement potential in 2030



Note: Emission reductions are measured relative to current policy forecast.

Source: Navius analysis using gTech.

The cost curve in Figure 1 reveals that the **lowest cost options** to reduce Canada’s emissions in 2030—beyond those targeted by current federal and provincial policies—include:

- Replacing fossil fuel-fired electricity with **renewable electricity**.
- Fuel switching from coal and oil to **natural gas** in electricity, manufacturing and transport.
- New technologies and practices to **manage methane** leaks and venting from oil and gas operations.

Medium cost abatement opportunities include:

- **Electrification** of end-use equipment, ranging from lower cost options like building heating to more expensive options like industrial heating and transport.
- New technologies and practices to **decarbonize steel production**.
- Improving the **efficiency** of energy use in buildings and industry.

Higher cost abatement opportunities include:

- Greater use of **bioenergy**, particularly to displace fossil energy-derived refined petroleum products like gasoline and diesel.
- **Capture and storage of carbon dioxide** from large point sources of emissions such as oil and gas production, electricity generation and chemicals manufacturing.

Lastly, **direct air capture** technology could provide significant additional reductions that are not quantified in this cost curve. This emerging technology removes carbon dioxide from the atmosphere and can potentially be used to produce synthetic fuels.

What is a marginal abatement cost curve?

Cost curves are a tool for visualizing the potential of low carbon technologies, fuels and actions. They do this by plotting the emission reduction potential (i.e., abatement) for a given incremental (i.e., marginal) cost.

Navius’ cost curves measure abatement relative to a current policy forecast. This approach helps identify the next available abatement opportunities, providing insight about where new policy interventions could be most effective.

About this analysis

Navius' gTech model provides a comprehensive framework for exploring greenhouse gas emission abatement opportunities. gTech is ideally suited for quantifying abatement potential in any Canadian province or sector because it:

- Provides a detailed accounting of low carbon technologies and fuels to reduce greenhouse gas emissions.
- Realistically simulates firm and consumer behaviour rather than simply prescribing financial cost-optimized solutions.
- Accounts for all existing provincial and federal policies, enabling the identification of the *next* available abatement opportunities beyond those targeted by current policy.

To find out how we create customized analyses, or if you have any questions about this research, please contact us at Contact@NaviusResearch.com.