

Achieving a High Ambition Pathway for Canada's 2035 NDC and 2050 Net-Zero Emissions Targets



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Abstract

Canadian federal climate policy faces a critical test in the coming months with the implementation of the *Building Canada Act*. Against the backdrop of trade uncertainty with the United States and the drive to diversify Canada's trading relationships, Canada's federal government will likely fast-track several major infrastructure projects that it deems to be in the "national interest." It is unclear to what extent this new legislation will be used to prioritize projects that accelerate Canada's clean energy transition or whether it will be utilized as justification for building new fossil-fuel infrastructure, like oil pipelines and liquefied natural gas (LNG) export terminals. Using an open-source integrated assessment model, climate-policy scenarios for Canada through 2050 are examined herein, with a focus on the tension between *Climate First* and *Fossil First* variations of a *Current Policies* scenario that reflects Canada's existing federal climate policies. Additional scenarios examine how these initial three scenarios still fall short of putting Canada on a *High Ambition* pathway to achieve its emissions targets en route to net-zero greenhouse gas (GHG) emissions by 2050.

Background

Canada's new government faces some of the most consequential national policy challenges in decades, as the country grapples with shifting global dynamics, domestic economic pressures, and increasing public scrutiny of the country's environmental commitments. The Canadian economy remains deeply intertwined with that of the United States, with approximately 75% of Canadian exports destined for the U.S. market as of 2024 and importing nearly half of its goods from the United States¹. This longstanding economic dependency has made Canada particularly vulnerable to shifts in U.S. trade and regulatory policy. With the inauguration of a new administration in Washington earlier this year that is actively pursuing a protectionist and inward-looking domestic agenda, Canada's economic durability and its relationship with the United States has been thrown into uncertainty. The implications of this shift have reverberated across Canada's political landscape and were a major factor in the outcome of the April 2025 federal election, which resulted in a minority government led by Mark Carney and the Liberal Party. Carney, a former central banker with international credentials, was seen by many voters as a steady hand capable of navigating the complex intersection of economic stability, international diplomacy, and climate responsibility.

In response to these economic headwinds, the new Carney government has prioritized a suite of reforms aimed at bolstering Canada's economic resilience and reducing its overdependence on the U.S. market. These reforms include efforts to expand trade relationships with emerging and established global partners, dismantle long-standing interprovincial trade barriers that have hampered domestic economic integration, and fast-track the development of large-scale infrastructure projects deemed essential to the country's future prosperity. At the center of this ambitious agenda is the *Building Canada Act*, which received royal assent on June 26, 2025, as part of the broader *One Canadian Economy Act* (the Act). This legislation grants the federal government significant new powers to unilaterally designate infrastructure projects as being in the "national interest," allowing them to bypass many of the regulatory and permitting hurdles that have traditionally slowed major developments².

Understanding how the Canadian federalist system operates is key to appreciating the significance and the potential challenges of implementing legislation like the *Building Canada Act*. Canada adopts a federalist model, meaning that constitutional powers are divided between the federal government, provinces, and territories³. While the federal government has authority over areas such as international



trade, national defense, and interprovincial infrastructure, provinces hold jurisdiction over natural resources, energy development, and environmental regulation within their borders³. This division of powers often leads to complex intergovernmental negotiations, particularly when it comes to large infrastructure projects that cross provincial boundaries or have environmental implications. The *Building Canada Act*, by granting the federal government the authority to fast-track projects deemed to be in the “national interest,” could potentially challenge or override certain provincial powers, thus raising concerns about jurisdictional overreach and prompting questions about how federal and provincial governments will cooperate, or clash, over the Act’s implementation. In this context, Canada’s federalist structure adds an additional layer of political and legal complexity to already high-stakes decisions about the country’s economic and climate future.

This new authority has raised critical questions about how the Act will be wielded, particularly in relation to Canada’s climate commitments. What remains uncertain is whether the government will use this legislative tool primarily to advance projects aligned with Canada’s goal of net-zero GHG emissions by 2050, such as renewable energy developments, grid integration, and clean technology deployment – or whether it will prioritize infrastructure that supports the extraction, transportation, and export of fossil fuels in an effort to maximize economic opportunities in the oil and gas sector.

Analytical Approach

Five scenarios covering a range of different climate policy pathways in Canada are examined in this report using the Global Change Analysis Model (GCAM). GCAM is a global integrated assessment model of the climate, energy, land, water, and socioeconomic systems with Canada as one of the model’s 32 regions⁴. GCAM is an open-source model that has been used for assessing climate policy and energy system transformations within several country contexts and was one of three models used in the federal government’s analysis supporting Canada’s Long-Term Strategy submission to the United Nations Framework Convention on Climate Change⁵⁻¹⁰. Additional details on modeling assumptions are described in the Appendix at the end of this report. The first three modeled scenarios represent near-term Canadian climate policy pathways with detailed bottom-up policy representation:

- ▶ **Current Policies:** Canada fully implements existing federal climate policies such that all modeled on-the-books policies deliver their intended emissions reductions. A full list of modeled policies is included in Table 1 and corresponding modeling assumptions for each of them in Table A2 of the appendix to this report.
- ▶ **Fossil First:** This scenario is a variation of the *Current Policies* scenario in which the *Building Canada Act* is used to facilitate construction of large oil-and-gas infrastructure projects and expand fossil-fuel export capacity. Climate policy is less of a priority for the federal government in this scenario, resulting in lagging implementation efforts for existing policies.
- ▶ **Climate First:** This scenario is a variation of the *Current Policies* scenario in which the *Building Canada Act* is used to facilitate the energy transition through the building of major grid expansion and clean energy projects. Greater emphasis on policy implementation efforts for existing policies occurs along with enhanced policy actions that are more ambitious than those already on the books.

Table 1. Canadian federal climate policies modeled in GCAM. Under the column for each scenario are the assumptions for modeled ambition and effectiveness of each policy. ‘Medium’ represents the intended impact of the policy, while ‘lower’ represents lagging implementation of the policy compared to the ‘medium’ assumptions and ‘higher’ represents greater focus on implementation, and, for some policies, increased policy stringency. CCUS = carbon capture utilization and storage. LNG = liquefied natural gas. LDV = light-duty vehicle. ZEV = zero-emission vehicle.

Sector	Policy	Policy Ambition and Effectiveness		
		Fossil First	Current Policies	Climate First
Multisector	Fuel charge	medium	medium	medium
	Clean fuel regulations	lower	medium	higher
	CCUS investment tax credit	lower	medium	higher
Electricity	Coal phase-out	medium	medium	higher
	Clean electricity investment tax credit	lower	medium	higher
	Clean electricity regulations	lower	medium	higher
Industry	Clean technology investment tax credit	lower	medium	higher
	Hydrogen production investment tax credit	lower	medium	higher
	Output-based pricing system	lower	medium	higher
	Oil and gas methane target	lower	medium	higher
	Increased oil and LNG exports	medium	not modeled	not modeled
	Net zero accelerator and strategic innovation fund	medium	medium	medium
Transportation	LDV ZEV mandate	lower	medium	medium
	LDV emissions regulations	lower	medium	medium
	ZEV incentives	lower	medium	higher
	ZEV infrastructure program	lower	medium	higher
	Active transportation strategy	lower	medium	higher
	Freight truck emissions regulations	lower	medium	higher
	Freight truck ZEV sales mandate	not modeled	not modeled	medium
Buildings	Greener homes program	medium	medium	medium
	Green buildings strategy	lower	medium	higher
	Building shell efficiency improvements	lower	medium	higher
Waste	Landfill methane reduction target	lower	medium	higher
Agriculture	Agricultural clean technology program	medium	medium	medium

Two additional scenarios explore variations of the *Climate First* scenario in the context of Canada achieving its emissions reduction targets in 2030 and 2035:

- **Moderate Ambition:** This scenario is a variation of the *Climate First* scenario with the addition of a top-down GHG emissions constraint such that Canada reduces GHG emissions linearly from the assumed 2025 level of 685 MtCO₂e to 45% below 2005 levels by 2035 (consistent with achieving the low end of Canada’s 2035 Nationally Determined Contribution (NDC) target under

the Paris Agreement of 45-50% below 2005 levels) and then linearly from this 2035 level to net-zero GHG emissions by 2050. Emissions reductions in this scenario fall short of Canada's 2030 NDC of 40-45% below 2005 levels, and this is in line with recent analysis that Canada is likely to fall short of its 2030 NDC¹¹.

- **High Ambition:** This scenario is a variation of the *Climate First* scenario with the addition of a top-down GHG emissions constraint such that Canada reduces GHG emissions from the assumed 2025 level of 685 MtCO₂e to 40% below 2005 levels by 2030 (consistent with achieving the low end of Canada's 2030 NDC target of 40-45% below 2005 levels) and then from this 2030 level to net-zero GHG emissions by 2050. Emissions reductions in this scenario for 2035 are 55% below 2005 levels, which exceeds Canada's existing 2035 NDC target of 45-50% below 2005 levels. Figure 1 shows Canada's current 2035 NDC lagging behind its peers, and thus the modeled 55% reduction below 2005 levels for 2035 in this scenario represents Canada raising its climate policy ambition to increase its standing with its peers as it tries to build stronger relationships with them.

Comparison of 2035 NDC targets for selected countries

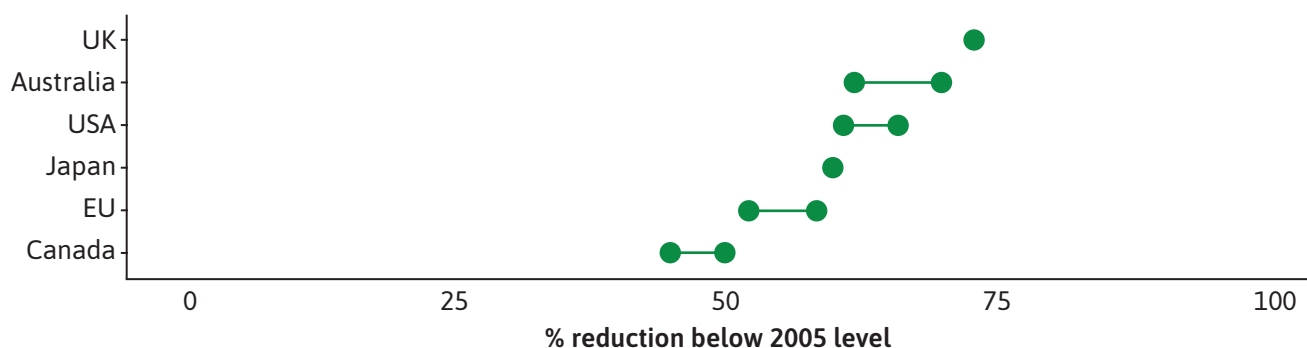


Figure 1. Canada's 2035 NDC compared to its peers. 2035 NDCs for the EU, the UK, and Japan have base years different from 2005, but were adjusted to reductions from a 2005 baseline for ease of comparison. Given that all countries chose a base year close to their peak emissions, this figure would look even less favourably for Canada if their targets were shown based on their chosen base years.

Results

GHG emissions trajectories

Full implementation of existing federal climate policies in Canada, as modeled in the *Current Policies* scenario, could result in GHG emissions reductions of 15% by 2030 and 22% by 2035 compared to baseline emissions in 2005 (Figure 2A). However, in the *Fossil First* scenario, where climate policy implementation is deprioritized in favor of infrastructure buildout to facilitate rising fossil-fuel exports, emissions reductions relative to 2005 levels shrink to 12% in 2030 and 16% in 2035. Alternatively, in the *Climate First* scenario, where the focus of the federal government is maximizing climate policy implementation efforts for policies already on the books and expanding their stringency in 2035, emissions reductions could reach 29% below 2005 levels in 2035. The *Climate First* scenario represents a significant improvement over the *Current Policies* scenario in terms of emissions reductions achievable through 2035, but is still well short of Canada's existing 2035 NDC, let alone the 55% reduction modeled in the *High Ambition* scenario.

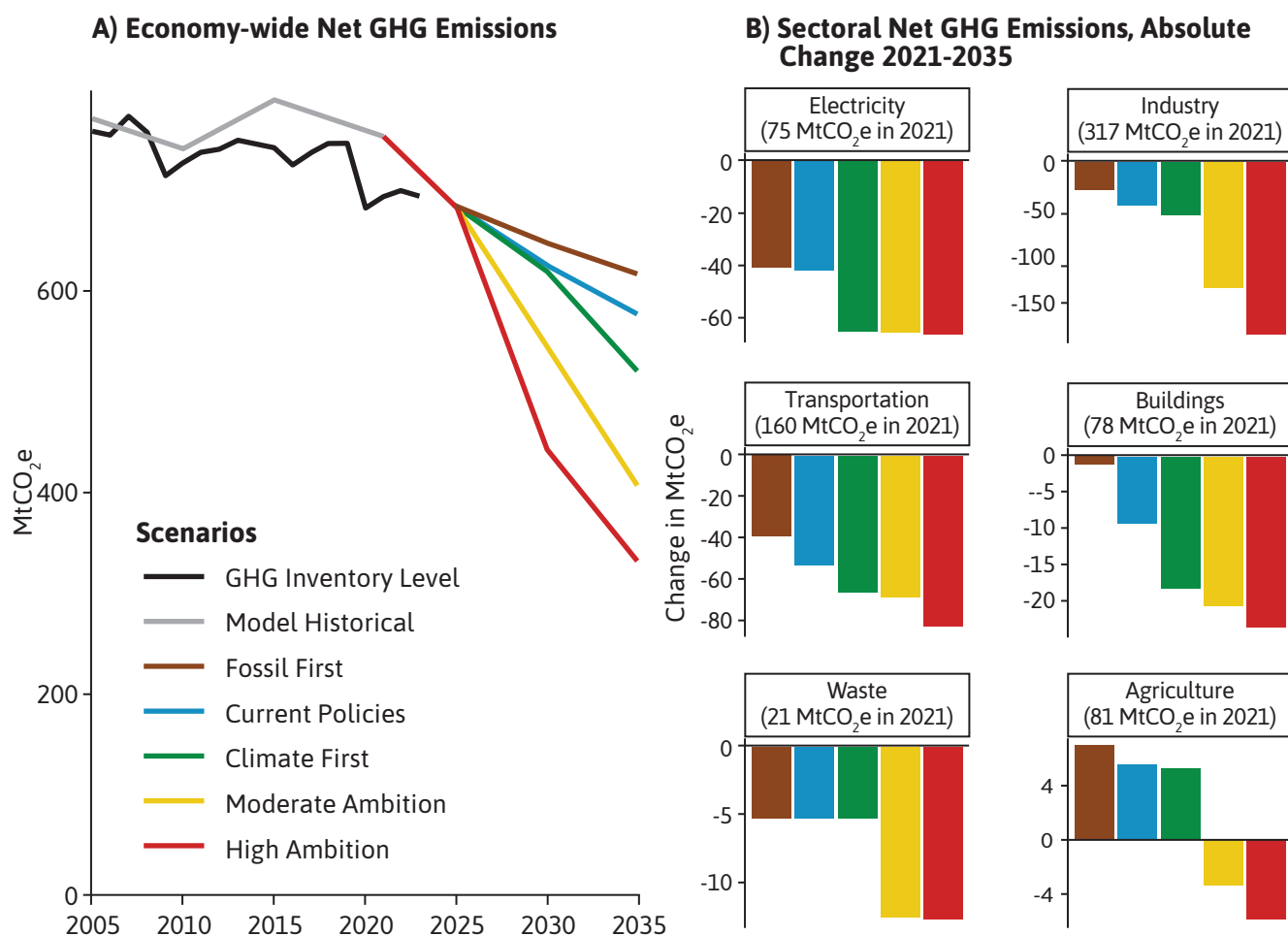


Figure 2. A) Economy-wide net GHG emissions compared to historical emissions from Canada's *National Inventory Report*.¹² B) Absolute change in net GHG emissions by sector from 2021.

If the *High Ambition* scenario is taken to represent a benchmark for sectoral emissions reductions in other scenarios, then it can be used to assess the relative sufficiency of federal climate policy across sectors (Figure 2B). Electricity sector emissions reductions from 2021 to 2035 in the *Current Policies* scenario are about two-thirds of the level achieved in the *High Ambition* scenario. Furthermore, reductions over the same period in the *Climate First* scenario are nearly on par with reductions in the *High Ambition* scenario. Conversely, emissions reductions achieved through 2035 across industrial sectors in the *Fossil First*, *Current Policies*, and *Climate First* scenarios appear insufficient to put Canada on a *High Ambition* emissions-reduction pathway in which emissions reductions are over three times larger. Of course, emissions from the oil and gas sector are included within the industrial sectors category, and policy action there is politically fraught with deep regional divisions. Both the transportation and buildings sectors show appreciable progress across from the *Fossil First* scenario to the *Current Policies* scenario to the *Climate First* scenario with emissions reductions increasing steadily as policy ambition is enhanced and policy implementation is prioritized. The waste and agricultural sectors show smaller opportunities for emissions reductions through 2035 in terms of absolute emissions reductions, but in relative terms, reductions achieved even in the *Climate First* scenario are inconsistent with those achieved in the *High Ambition* scenario.

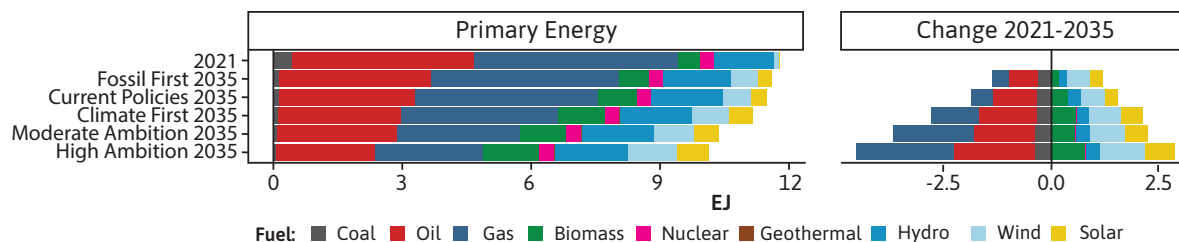
Evolution of the energy system

The scale of change in Canada's energy system across scenarios through 2035 is evident in Figure 3. The evolution of the fuel mix for primary energy is a high-level proxy for the scale of transformation in the energy system. From 2021 to 2035, the reduction in total fossil fuel consumption in the *Climate First* scenario is more than twice as large as in the *Fossil First* scenario (Figure 3A). And in the *High Ambition* scenario, the reduction in fossil fuel consumption is more than three times that in the *Fossil First* scenario over the same period. Net growth in primary energy consumption across scenarios comes entirely from renewables: wind, solar, hydro, biomass, and geothermal.

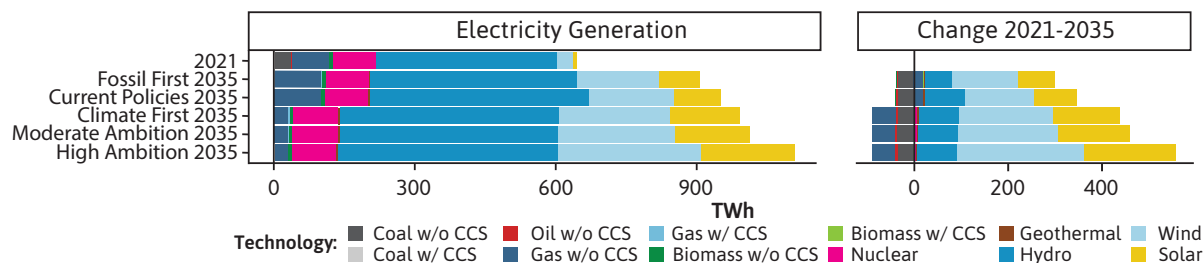
Compared to total electricity generation in 2021, the grid grows 41% in the *Fossil First* scenario, 48% in the *Current Policies* scenario, and 55% in the *Climate First* scenario with the range attributable to the rate of end-use electrification (Figure 3B). Notably, in the *High Ambition* scenario, the size of the grid grows more than 70% over the same period. Growth in electricity demand over this period is mostly met with wind and solar buildout, accompanied by moderate increases in hydropower. The scale of wind and solar expansion increases as the level of climate policy prioritization increases. The electricity mix is characterized by phase-out of unabated coal-fired generation and retention of existing nuclear capacity across all scenarios from 2021 through 2035. Gas generation grows slightly over the same period in the *Fossil First* and *Current Policies* scenarios, but falls in the *Climate First* scenario. Altogether, the electricity sector in the *Climate First* scenario represents a potential bright spot in Canadian climate policy, driven by the phase-out of coal-fired electricity generation and clean electricity regulations targeting residual unabated gas generation.

End-use electrification is the dominant driver of change in how energy is used in buildings, industry, and transportation. In the buildings sector, electrified end-uses account for nearly all growth in energy demand from 2021 to 2035, accompanied by reductions in gas consumption across all scenarios except the *Fossil First* scenario (Figure 3C). On top of electrification in industry (Figure 3D) and transportation (Figure 3E), there is also growth in biofuel consumption through 2035 to displace a growing fraction of oil-based refined liquids. A *High Ambition* scenario for industry implies a more than 50% increase in the amount of electrification growth over the period from 2021 to 2035 than in the *Climate First* scenario – and even greater increases compared to the *Current Policies* and *Fossil First* scenario. For the evolution of the transportation sector over this period, LDV electrification is the key difference between the energy mix in the *Fossil First* and *Climate First* scenarios. Accelerated freight decarbonization and greater biofuel blending are the key differences between the *Climate First* and *High Ambition* scenarios.

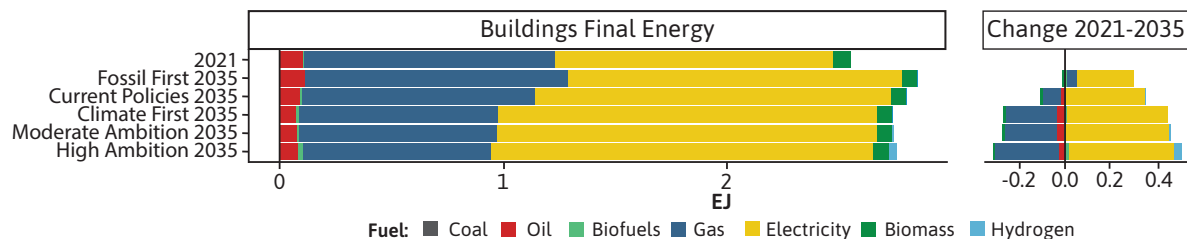
A) Primary Energy by Fuel



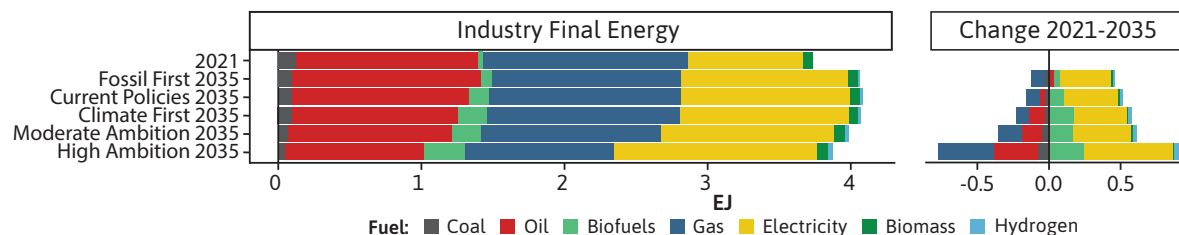
B) Electricity Generation by Technology



C) Buildings Final Energy by Fuel



D) Industry Final Energy by Fuel



E) Transportation Final Energy by Fuel

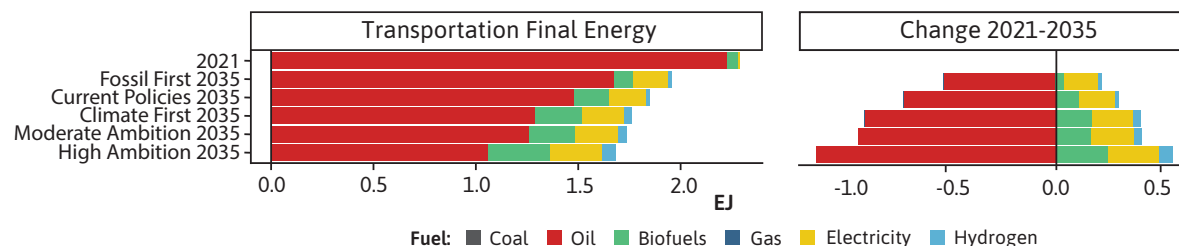


Figure 3. A) Primary energy by fuel in 2035 relative to 2021 across scenarios. **B)** Electricity generation by technology in 2035 relative to 2021 across scenarios. **C)** Buildings final energy by fuel in 2035 relative to 2021 across scenarios. **D)** Industry final energy by fuel in 2035 relative to 2021 across scenarios. **E)** Transportation final energy by fuel in 2035 relative to 2021 across scenarios.

Key decarbonization metrics

Some of the key metrics for assessing progress on decarbonization through 2035 across scenarios are shown in Figure 4A. Clean sources accounted for 80% of electricity generation in 2021, but the clean electricity regulations, along with support from other policies, push the clean electricity share in 2035 to 88% in the *Current Policies* scenario and 95% in the *Climate First* scenario. Growth in wind and solar are key drivers of electricity sector decarbonization, reaching 29% and 38% of generation in the *Current Policies* and *Climate First* scenarios, respectively – up from 6% in 2021 and nearing the 45% level achieved in the *High Ambition* scenario by 2035. The ZEV mandate results in ZEV sales accounting for 100% of new LDVs by 2035 in all scenarios except the *Fossil First* scenario, where they reach only 69%. Freight truck electrification is exceedingly slow through 2035 in the *Fossil First* and *Current Policies* scenarios, but with inclusion under the ZEV mandate (albeit at a slower rate than LDVs), ZEV sales shares are projected to reach 30% by 2035 for freight trucks in the *Climate First* and *High Ambition* scenarios. Residential heating electrification rates have the potential to be consistent with those in a *High Ambition* scenario with a *Climate First* focus on implementation of existing policies and increasing policy stringency through 2035. Industrial electrification in both the *Current Policies* and *Climate First* scenarios through 2035 lags behind a *High Ambition* pathway, implying the need for additional policy action.

Oil exports grow from 2021 to 2035 in the *Fossil First*, *Current Policies*, and *Climate First* scenarios as international demand continues to grow (Figure 4B). Conversely, oil exports decline over the same period in the *Moderate Ambition* and *High Ambition* scenarios as countries in the rest of the world also pursue climate policy consistent with putting their economies on track to achieve net-zero on their intended timelines. Through 2035, LNG exports grow considerably in the *Fossil First* scenario with assumed government support for building out LNG export infrastructure (Figure 4B).

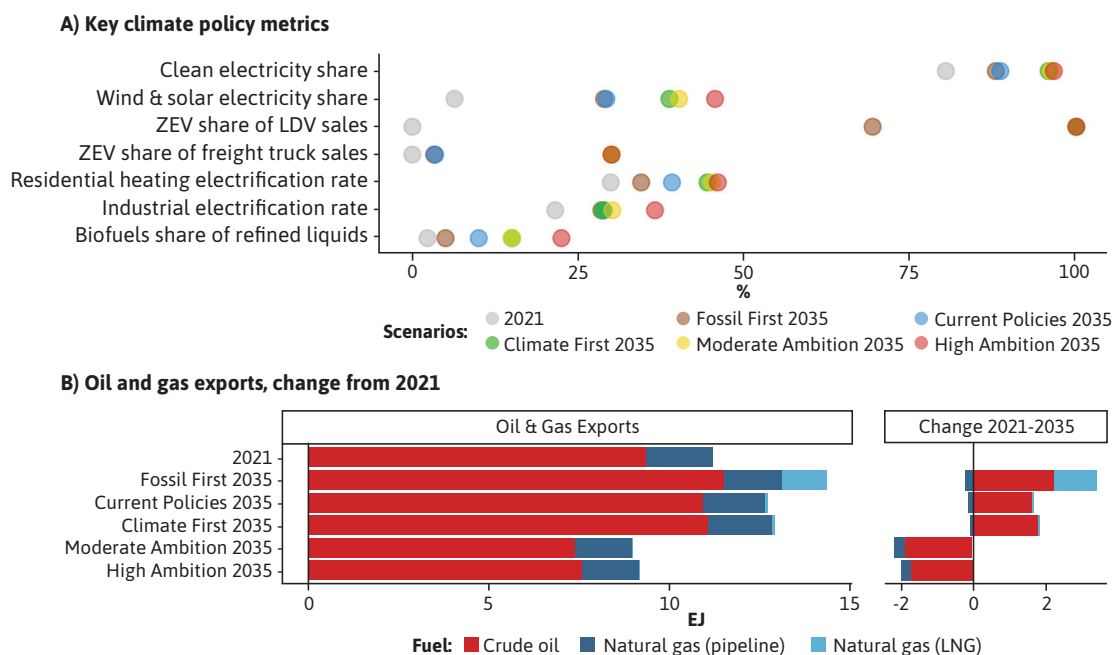


Figure 4. A) Key climate policy metrics in 2035 relative to 2021 across scenarios. Due to shared assumptions, the *Current Policies*, *Climate First*, *Moderate Ambition*, and *High Ambition* scenarios fully coincide at 100% ZEV sales shares of LDVs. Similarly, for ZEV sales shares of freight trucks, the *Fossil First* and *Current Policies* scenarios coincide at 3% and *Climate First*, *Moderate Ambition*, and *High Ambition* at 30%. **B)** Oil and gas exports in 2035 relative to 2021 across scenarios.

Implications for net-zero

Given that 2035 represents an approximate halfway point from Canada's 2021 commitment to achieve net-zero GHG emissions by 2050, emissions reductions for 2035 should be viewed in terms of overall progress towards net-zero. In the *High Ambition* scenario, emissions reductions over the 2021 to 2035 period are slightly larger than over the 2035 to 2050 period (Figure 5A). However, the level of emissions reductions that would be required over the 2035 to 2050 period for achievement of net-zero by 2050 in the *Fossil First*, *Current Policies*, and *Climate First* scenarios are over four, three, and two-and-a-half times greater than those achieved from 2021 to 2035, respectively. Such a disparity underscores the importance of Canada pursuing a *High Ambition* climate pathway to avoid continued passing of the buck to future decision makers to address Canada's contribution to climate change. Furthermore, Canada's contribution to global peak temperature is 40% higher if it were to follow a *Fossil First* pathway to 2035 and then to net-zero by 2050 compared to following a *High Ambition* pathway over that entire period. The same dynamic appears for end-use sectors, with emissions reductions in buildings, industry, and transportation significantly backloaded in the *Fossil First*, *Current Policies*, and *Climate First* scenarios, but more balanced between near-term and long-term in the *High Ambition* scenario. Electricity sector emissions reductions are more front-loaded, especially in the *High Ambition* scenario. The increased reliance on net CO₂ removals post-2035 via direct air carbon capture and storage (DACCS) and land use, land-use change, and forestry (LULUCF) across all scenarios is highly uncertain, and if these removal options prove to be limited in scalability, even greater mitigation of residual emissions in other sectors will be necessary. Reducing emissions in agriculture, especially non-CO₂ emissions, is a challenge across all modeled scenarios, but if measurable progress could be made in this area, it could reduce decarbonization pressures on both hard-to-abate residual emissions and scaling of CO₂ removal options.

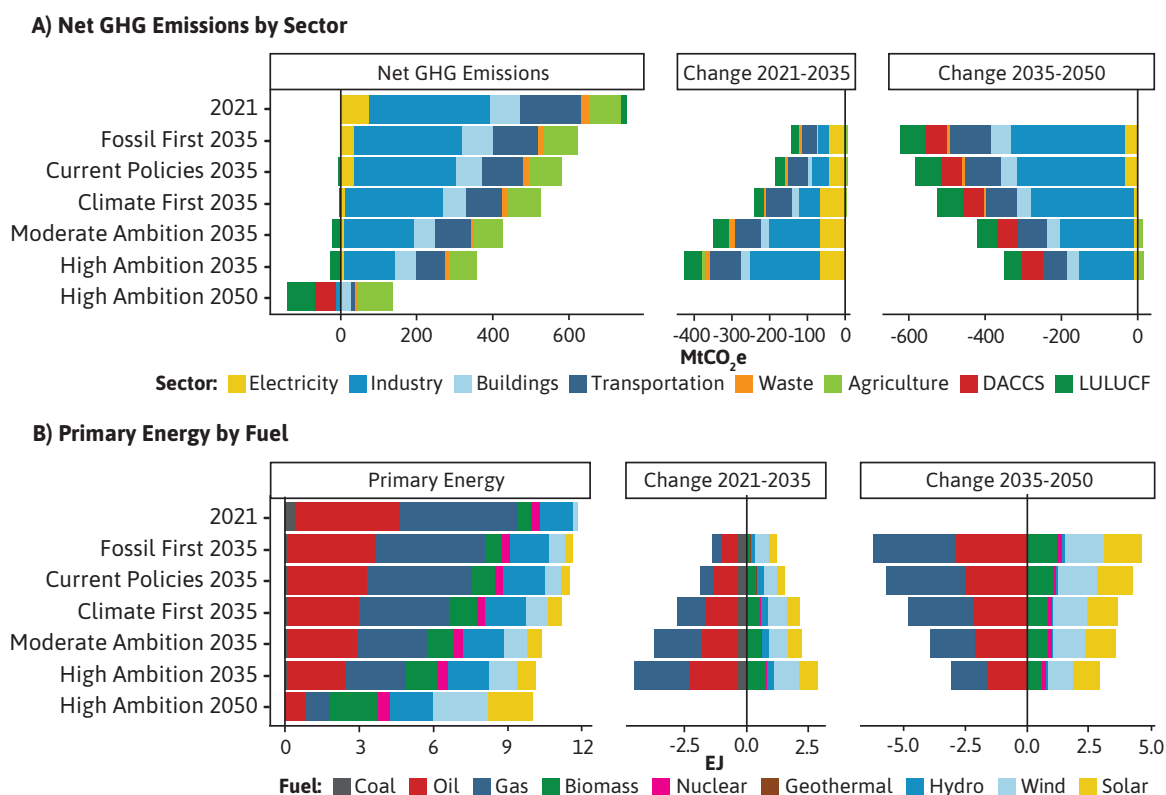


Figure 5. A) Net GHG emissions by sector in 2035 across scenarios relative to 2021 and to 2050 in the *High Ambition* scenario. B) Primary energy by fuel in 2035 across scenarios relative to 2021 and to 2050 in the *High Ambition* scenario.

The same now-versus-later decarbonization theme observed across scenarios in Figure 5A is also seen with primary energy in Figure 5B. As a proxy for the scale of transformation in the energy sector as a whole, the difference in the magnitude of change in the *Fossil First* scenario over the 2021 to 2035 period compared to the 2035 to 2050 period highlights the risk of such a pathway. Alternatively, a *High Ambition* scenario results in a balanced and steady transition toward a net-zero economy. Achieving emissions reductions by 2035 consistent with those in a *High Ambition* scenario and the associated transformation of the energy system is vital to put Canada on a pathway towards achieving net-zero by 2050.

Policy Implications

Canada's emissions have remained relatively flat in recent years, and recent data shows that the country is not on track to meet its 2030 NDC target of reducing emissions by 40-45% below 2005 levels¹³. According to an early estimate from the Canadian Climate Institute, emissions in 2024 were about 694 MtCO₂e, and that figure is almost unchanged from 2023, and equates to an 8.5% reduction below 2005 levels¹¹.

To achieve its NDC targets, Canada must implement a broad suite of climate policies across all sectors of the economy¹⁴. Central to Canada's climate policy approach is the commitment to achieve net-zero greenhouse gas emissions by 2050, a goal enshrined in law through the *Canadian Net-Zero Emissions Accountability Act*. This legislation mandates legally binding five-year targets, creating a structured framework for emissions reductions and imposes clear expectations for both federal and provincial governments¹⁵. However, despite the releases of regulatory frameworks and climate mandates, implementation of policy remains weak. The Commissioner of the Environment and Sustainable Development has warned that key mitigation measures are delayed or inadequately prioritized, which reduces the chances of meeting emissions goals¹³. Additionally, sectors like transportation, buildings, and industry have been challenging to decarbonize fully, due to infrastructure, cost, behavioural, or regulatory barriers¹⁶.

Nevertheless, emissions from the buildings and transportation sectors are on the decline, despite growing demand, due to the adoption of innovations like heat pumps, hybrid drivetrains, and electric vehicles¹⁷. Over the previous decades, Canada has also relied on a substantial proportion of renewable and low-carbon energy sources, such as hydro and nuclear, for its electricity generation¹⁷. Furthermore, the transition to renewables and ZEVs is moving from early-adoption, which requires policy support and higher market prices, to a premium-technology stage, where deployment can accelerate without raising costs for consumers, and in many cases lower them¹⁸. This has contributed to a steady decline in overall emissions within the sector, aided by the expansion of wind and solar energy and a transition to cleaner power generation.

Emissions from the oil and gas sector, particularly from the oil sands, are the major barrier to GHG reductions in Canada. The oil and gas industry is Canada's largest source of GHG emissions, accounting for over 30% of the national inventory¹⁹. The federal government has proposed a cap on oil and gas sector emissions and committed to reducing methane emissions from this sector by 75% below 2012 levels by 2030²⁰. These measures are designed to limit emissions even as fossil fuel production continues, but if production continues to increase, reducing emissions intensity may not be enough to reduce total emissions from the sector. The federal government plans to set a cap on GHG emissions from the oil and gas sector and is committed to cutting methane emissions, but delayed implementation has slowed emissions reductions and fossil fuel extraction continues to expand in Alberta and

Saskatchewan^{13,21}. These activities directly conflict with national climate goals and highlight the tension between economic dependence on fossil fuels and climate ambition²².

The policy implications of a lag in emissions reductions are significant. First, missing emissions targets can undermine confidence in Canadian climate policy both domestically and internationally. It potentially weakens Canada's credibility in the Paris Agreement process, may reduce leverage for international collaboration, and might discourage investment in low-carbon technologies if policy signals (regulation, carbon pricing, incentives) are seen as uncertain. Additionally, the cost of catching up on emissions reductions could rise sharply the more Canada falls behind²³. If emissions reductions are delayed, then steeper annual cuts, more aggressive regulation, and higher investment will be needed in later years, potentially signifying higher fiscal costs, greater disruption to industries, and possibly more political contestation²⁴.

Accordingly, the climate implications of the Act will depend on how the federal government defines and enforces its climate criteria in the coming years. The law comprises two key legislative components, the *Free Trade and Labour Mobility in Canada Act* and the *Building Canada Act*, which aims to streamline internal trade, fast-track major infrastructure projects, and improve labour mobility across provincial and territorial boundaries². While its primary focus is on economic efficiency and national integration, its indirect and direct ramifications for climate action are substantial.

A major climate-related feature of the Act lies in the *Building Canada Act* component, which is designed to accelerate the construction of projects in the "national interest". These include infrastructure developments deemed critical to the country's long-term economic and environmental goals². Notably, one of the criteria for national interest designation is that a project must, "contribute to clean growth and Canada's objectives with respect to climate change"². This language is significant, as it embeds climate considerations directly into infrastructure planning and decision-making. In theory, a policy implementation strategy mirroring the *Climate First* scenario modeled herein could help mobilize large-scale investment in clean energy, public transit, electric vehicle infrastructure, and climate-resilient projects which can further advance Canada towards its NDC and net-zero goals.

Moreover, the Act seeks to reduce regulatory bottlenecks by moving toward a "one project-one review" model, cutting down the time it takes to get major projects approved². If implemented with a climate lens, this streamlining could reduce delays for clean infrastructure builds, like renewable energy installations and electricity transmission projects which are currently some of the most time-consuming and capital-intensive parts of the net-zero transition²⁵. The reduction of interprovincial trade and labour barriers may also speed up deployment of low-carbon technologies by making it easier to move goods, services, and certified workers between jurisdictions.

However, the Act also raises significant risks for climate policy if not carefully implemented. While it promotes fast-tracking, there is concern that some fossil fuel or carbon-intensive infrastructure projects could also qualify for the "national interest" designation based on economic or energy security arguments. Past examples of large-scale projects, such as oil pipelines or LNG terminals, have often been framed as essential to the national economy²⁵. Without strict definitions and accountability mechanisms for "clean growth," the Act could be implemented along the lines of the *Fossil First* scenario modeled herein, advancing emissions-intensive projects under the guise of national development. If "national interest" becomes a broad justification for all types of large-scale development, regardless of emissions impact, the Act could undermine Canada's climate credibility and long-term decarbonization goals.

Ultimately, this moment is pivotal for Canada's climate future as it is not only facing mounting pressure from trade disruptions and a growing affordability crisis but also navigating a critical juncture in its environmental policy trajectory. As such, environmental concerns risk being deprioritized in favor of short-term economic and political expediency. The decisions made in the coming months, particularly how the federal government applies its new project approval powers, will have the potential to shape the direction of Canada's climate policy for years, if not decades, to come. Whether the government chooses a *Climate First* or *Fossil First* interpretation of which projects are designated as being in the "national interest" will ultimately define Canada's role in the global energy transition and its credibility on climate action.



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Appendix

Modeling Assumptions

Table A1. Modeling assumptions included to either tailor GCAM parameters to the Canadian context, limit the growth of emerging technologies with uncertainties concerning their scalability, or improve the internal consistency of assumptions in a given scenario. These assumptions are identical across all scenarios unless specified otherwise.

Sector	Parameter	Modeling Assumptions
Economy-wide	Population	Population growth for Canada follows the M1 medium growth projection from Statistics Canada.
Electricity	Hydropower	Current Policies: Exogenously specified to match generation levels from hydro in the Canada Energy Regulator's 2023 Canada Net-zero scenario, reaching 1.684 EJ by 2035 and 1.708 EJ by 2050. Fossil First: Exogenously specified to match generation levels from hydro in the Canada Energy Regulator's 2023 Current Policies scenario reaching 1.580 by 2035 and 1.583 EJ by 2050. Climate First: Same as in <i>Climate First</i>, but with a faster post-2035 growth, reaching 1.747 EJ by 2050. Moderate Ambition: Same as in <i>Climate First</i>. High Ambition: Same as in <i>Climate first</i>.
	Existing nuclear capacity	Exogenously specified to match generation levels from existing nuclear plants in the Canada Energy Regulator's 2023 Current Policies scenario.
	New nuclear capacity	New nuclear capacity is not allowed until the 2035 model period.
	New CCS capacity	New fossil or biomass capacity with CCS is not allowed until the 2035 model period.
	New oil capacity	New oil capacity is not allowed after the 2021 model period.
Industry	Grey hydrogen production	Hydrogen production from gas w/o CCS is not allowed in any model period.
Buildings	Hydrogen consumption in residential buildings	Hydrogen consumption in residential buildings is not allowed in any model period.

Sector	Parameter	Modeling Assumptions
Global	Rest-of-world climate policy	Current Policies: GCAM regions in the ROW are assumed to achieve only half of the emissions reductions through 2050 that they are assumed to achieve in the <i>High Ambition</i> scenario. Fossil First: same as in <i>Current Policies</i> Climate First: same as in <i>Current Policies</i> Moderate Ambition: same as in <i>High Ambition</i> High Ambition: GCAM regions in the rest of the world are assumed to achieve net-zero GHG emissions in either 2050 (Argentina, Australia_NZ, EU-12, EU-15, European Free Trade Association, Japan, South Korea, and USA), 2060 (Brazil, China, Colombia, Europe_Non_EU, Mexico, South Africa, and Taiwan), or 2070 (Africa_Eastern, Africa_Northern, Africa_Southern, Africa_Western, Central America and Caribbean, Central Asia, India, Indonesia, Middle East, Pakistan, Russia, South Asia, Southeast Asia, South America_Northern, South America_Southern, and Ukraine)
	BECCS growth limit	Growth in carbon dioxide removals from BECCS is limited to 3,000 MtCO ₂ e/year globally by 2050, with a 25 MtCO ₂ e/year carve-out for Canada by 2050.
	DACCS growth limit	Growth in carbon dioxide removals from DACCS is limited to 3,000 MtCO ₂ e/year globally by 2050, with a 50 MtCO ₂ e/year carve-out for Canada by 2050.
	Bioenergy growth limit	Growth in primary energy from biomass is limited to 120 EJ/year globally by 2050, with a 1.6 EJ carve-out for Canada by 2050.

Table A2. Modeling assumptions for all Canadian federal climate policies modeled in GCAM. Under the column for each scenario are the implementation assumptions for each policy in each scenario. Unless noted otherwise, modeling assumptions for all explicitly modeled policies in the *Moderate Ambition* and *High Ambition* scenarios are the same as in the *Climate First* scenario.

Sector	Policy	Modeling Assumptions
Multisector	Canada GHG emissions constraints	Current Policies: Net GHG emissions limit of 685 MtCO₂e in 2025. Fossil First: Same as in <i>Current Policies</i>. Climate First: Same as in <i>Current Policies</i>. Moderate Ambition: Same as in <i>Current Policies</i> for 2025, then linear reduction from 2025 to 45% below 2005 levels by 2035, and linear reduction from 2035 to net-zero GHG emissions by 2050. High Ambition: Same as in <i>Current Policies</i> for 2025, then linear reduction from 2025 to 55% below 2005 levels by 2035, and linear reduction from 2035 to net-zero GHG emissions by 2050.
	LULUCF	Current Policies: Net CO₂ emissions of -12 MtCO₂/year in 2025 through 2050. Fossil First: Same as in <i>Current Policies</i>. Climate First: Same as in <i>Current Policies</i>. Moderate Ambition: Same as in <i>Current Policies</i> for 2025, then -30 MtCO₂/year in 2030, and linear increase from 2030 to -100 MtCO₂/year in 2050. High Ambition: Same as in <i>Current Policies</i> for 2025, then -30 MtCO₂/year in 2030, -50 MtCO₂/year in 2035, and linear increase from 2035 to -100 MtCO₂/year in 2050.
	Fuel charge	Current Policies: Tax on end-use consumption of fuels reaching \$80/tCO₂e in 2025 before being repealed. Applicable sectors include agriculture, buildings, construction, and transportation. Fossil First: Same as in <i>Current Policies</i>. Climate First: Same as in <i>Current Policies</i>.
	Clean fuel regulations	Current Policies: 5% minimum biofuels share of refined liquids production in 2025, rising to 10% in 2030, and holding constant through 2050. Fossil First: 5% minimum biofuels share of refined liquids production in 2025 through 2050. Climate First: 5% minimum biofuels share of refined liquids production in 2025, rising to 10% by 2030, 15% by 2035, and holding constant through 2050.
	CCUS investment tax credit	Current Policies: The effective value of the tax credit results in a 50% non-energy cost reduction for CCUS equipment in the electricity sector and industrial sectors in the 2025 and 2030 model periods (60% for DACCS), and 25% cost reduction in the 2035 and 2040 model periods (30% for DACCS). Fossil First: Same as in <i>Current Policies</i>, but the effective value of the tax credit is halved in all model periods. Climate First: Same as in <i>Current Policies</i>, but the effective value of the tax credit is doubled in the 2035 model period to match the level in the 2025 and 2030 model periods.

Sector	Policy	Modeling Assumptions
Electricity	Coal phase-out	Current Policies: Based on announced retirement dates for existing unabated coal-fired power plants, a limit is placed on electricity generation from coal of 0.047 EJ in 2025, and then 0.012 EJ in 2030 through 2050. Additionally, no new unabated coal-fired power plants are assumed to come online. Fossil First: Same as in <i>Current Policies</i>, but the 0.047 EJ limit in 2025 remains through 2050 Climate First: Same as in <i>Current Policies</i>, but unabated coal is fully phased out by 2035.
	Clean electricity investment tax credit	Current Policies: The effective value of the tax credit is assumed to be 30% of capital cost for new wind, solar, nuclear, or geothermal capacity from 2023 to 2033 and 15% in 2034. Implemented as a weighted average for applicable years within each of the 2025 through 2035 model periods. Fossil First: Same as in <i>Current Policies</i>, but the effective value of the tax credit is halved in all model periods. Climate First: Same as in <i>Current Policies</i>, but the full 30% value of the tax credit is available through 2035.
	Clean electricity regulations	Current Policies: Implemented as a constraint on unabated gas generation equal to 0.35 EJ in 2035, 0.25 EJ in 2040, 0.15 EJ in 2045, and 0.10 EJ in 2050. Fossil First: Implemented as a constraint on unabated gas generation equal to 0.35 EJ in 2035, 0.30 EJ in 2040, 0.25 EJ in 2045, and 0.20 EJ in 2050. Climate First: Implemented as a constraint on unabated gas generation equal to 0.10 EJ in 2035, 0.05 EJ in 2040, 0.025 EJ in 2045, and 0 EJ in 2050.
Industry	Clean technology investment tax credit	Current Policies: The effective value of the tax credit is assumed to be 30% of capital cost for new energy service powered by electricity or hydrogen in agricultural, construction, and mining sectors from 2023 to 2033 and 15% in 2034. Implemented as a weighted average for applicable years within each of the 2025 through 2035 model periods. Fossil First: Same as in <i>Current Policies</i>, but the effective value of the tax credit is halved in all model periods. Climate First: Same as in <i>Current Policies</i>, but the full 30% value of the tax credit is available through 2035.

Sector	Policy	Modeling Assumptions
Industry	Hydrogen production investment tax credit	Current Policies: The effective value of the tax credit is assumed to be 40% of capital cost for green hydrogen production and 15% for other non-emitting hydrogen production pathways (i.e., gas w/ CCS) from 2023 to 2034. Implemented as a weighted average for applicable years within each of the 2025 through 2035 model periods. Fossil First: Same as in <i>Current Policies</i>, but the effective value of the tax credit is halved in all model periods. Climate First: Same as in <i>Current Policies</i>, but the full 30% value of the tax credit is available through 2035.
	Output-based pricing system	Current Policies: Implemented as a carbon tax on industrial activities based on benchmark carbon price levels of \$95/tCO₂e and \$170/tCO₂e in 2030 through 2050 with reductions accounting for whether an industrial sector falls under the 80% emissions-intensity benchmark with 2% annual tightening, the 90% emissions-intensity benchmark with 2% annual tightening, or the 95% emissions-intensity benchmark with 1% annual tightening. Fossil First: Same as in <i>Current Policies</i>, but with no additional tightening beyond 2030. Climate First: Same as in <i>Current Policies</i>, but with the benchmark carbon price increasing annually by \$15/tCO₂e, reaching \$470/tCO₂e by 2050.
	Oil and gas methane target	Current Policies: A methane fee is imposed on oil and gas production within the model to trigger reductions on exogenously specified marginal abatement cost (MAC) curves (calculated by the EPA) at or below \$10/tCO₂e in 2025, and \$485/tCO₂e in 2030 through 2050. Fossil First: Same as in <i>Current Policies</i>, but the methane fee remains at the 2025 level of \$10/tCO₂e through 2050. Climate First: Same as in <i>Current Policies</i>, but the methane fee rises to \$1,092/tCO₂e in 2035 and \$4,852/tCO₂e in 2040 through 2050.
	Increased oil and LNG exports	Current Policies: Not modeled in this scenario. Fossil First: A binding floor is imposed on Canadian crude oil exports of 10.5 EJ in the 2030 model period and 11.5 EJ in the 2035 through 2050 model periods. A binding floor is imposed on Canadian LNG exports of 0.8 EJ in the 2030 model period and 1.2 EJ in the 2035 through 2050 model periods. Climate First: Not modeled in this scenario.
	Net Zero Accelerator and Strategic Innovation Fund	Current Policies: Accelerated retirement of older and less efficient industrial equipment. Fossil First: Same as in <i>Current Policies</i>. Climate First: Same as in <i>Current Policies</i>.

Sector	Policy	Modeling Assumptions
Transportation	LDV ZEV mandate	Current Policies: ZEV sales shares of new LDVs reach 60% by 2030 and 100% by 2035. Fossil First: ZEV sales shares of new LDVs reach 39% by 2030, 69% by 2035, and 100% by 2040. Climate First: Same as in <i>Current Policies</i>.
	LDV emissions regulations	Current Policies: Internal combustion engine efficiency modeled to improve at a rate consistent with the EPA's 2024 GHG emissions standards. Fossil First: Same as in <i>Current Policies</i>, but the annual improvement in internal combustion engine efficiency is modeled to match the EPA regulations that were in place prior to the 2024 regulations. Climate First: Same as in <i>Current Policies</i>.
	ZEV incentives	Current Policies: A \$5,000/vehicle ZEV tax credit is modeled for new LDVs in the 2025 model period. For freight trucks, the level of the ZEV tax credit is \$10,000/vehicle, \$40,000/vehicle, or \$200,000/vehicle depending on weight class through 2026. Implemented as a weighted average for applicable years within each of the 2025 through 2035 model periods. Fossil First: Same as in <i>Current Policies</i>, but the freight truck tax credit goes to zero after 2025. Climate First: Same as in <i>Current Policies</i>, but the ZEV tax credit remains in force through 2035 for both LDVs and freight trucks.
	ZEV infrastructure program	Current Policies: A \$250/vehicle reduction in capital infrastructure cost is modeled for new ZEV LDVs in the 2025 and 2030 model periods. Fossil First: Same as in <i>Current Policies</i>, but the level of the cost reduction is reduced to \$125/vehicle in the 2030 model period. Climate First: Same as in <i>Current Policies</i>, but the level of the cost reduction is increased to \$375/vehicle in the 2030 model period.
	Active transportation strategy	Current Policies: Changes in transportation patterns and urban design reduce total per capita passenger transport demand by 0.33% annually from the 2030 model period through the 2050 model period. Fossil First: Same as in <i>Current Policies</i>, but the annual reduction in total per capita passenger transport demand is halved from the 2030 model period through the 2050 model period. Climate First: Same as in <i>Current Policies</i>, but the annual reduction in total per capita passenger transport demand increases linearly from 0.33% in the 2030 model period to 1% in the 2050 model period.

Sector	Policy	Modeling Assumptions
Transportation	Freight truck emissions regulations	Current Policies: Internal combustion engine efficiency for new freight trucks improves by 10% from the 2021 to 2025 model period, by 15% from the 2021 to 2030 model period and then at the default improvement rates in GCAM from 2030 through 2050. Fossil First: Same as in <i>Current Policies</i>, but additional improvements in efficiency cease after 2030. Climate First: Same as in <i>Current Policies</i>, but efficiency improves at twice the default improvement rates in GCAM from 2030 through 2050.
	Freight truck ZEV sales mandate	Current Policies: Not modeled in this scenario. Fossil First: Not modeled in this scenario. Climate First: ZEV sales shares of new freight trucks reach 10% by 2030, 30% by 2035, 50% by 2040, 70% by 2045, and 100% by 2050.
Buildings	Greener homes program	Current Policies: Represented as modest reductions in non-energy costs for electrified energy service in residential buildings. Fossil First: Same as in <i>Current Policies</i>. Climate First: Same as in <i>Current Policies</i>.
	Green buildings strategy	Current Policies: Total building electrification rises to no more than 2.0 EJ by 2050. Fossil First: Same as in <i>Current Policies</i>, but the level of growth through 2050 reaches no more than 1.7 EJ. Climate First: Same as in <i>Current Policies</i>, but the level of growth through 2050 reaches no more than 2.4 EJ.
	Building shell efficiency improvements	Current Policies: For the 2030 model period, average building shell efficiency improves at 2 times the default incremental improvement rate in GCAM from the 2025 model period. Fossil First: Same as in <i>Current Policies</i>, but the improvement rate from the 2025 model period to the 2030 model period is only 1.5 times the default incremental improvement rate in GCAM. Climate First: Same as <i>Current Policies</i>, but the average building shell efficiency continues to improve at 2 times the default incremental improvement rate in GCAM from one model period to the next through 2050.
Waste	Landfill methane reduction target	Current Policies: A methane fee is imposed on landfills within the model to trigger reductions on exogenously specified marginal abatement cost (MAC) curves (calculated by the EPA) at or below \$10/tCO₂e in 2025, and \$32/tCO₂e in 2030 through 2050. Fossil First: Same as in <i>Current Policies</i>, but the methane fee remains at the 2025 level of \$10/tCO₂e through 2050. Climate First: Same as in <i>Current Policies</i>, but the methane fee rises to \$66/tCO₂e in 2035, \$129/tCO₂e in 2035, and \$485/tCO₂e in 2045 through 2050.

Sector	Policy	Modeling Assumptions
Agriculture	Agricultural clean technology program	Current Policies: Accelerated retirement of older and less efficient industrial equipment. Fossil First: Same as in <i>Current Policies</i>. Climate First: Same as in <i>Current Policies</i>.