EF2025 Discussion Paper Results – A Summary of What we Heard

Introduction

Canada's Energy Future, a flagship series of publications by the Canada Energy Regulator (CER), provides critical insight into the long-term energy landscape for Canadians. It uses economic and energy models to explore potential pathways for Canada's energy future, based on assumptions about certain trends, including climate policies, technology, and consumer behavior. The upcoming edition, Canada's Energy Future 2025 (EF2025), will include scenarios that are consistent with Canada's commitment to achieve net-zero emissions by 2050 as well as a baseline "Current Measures" scenario.

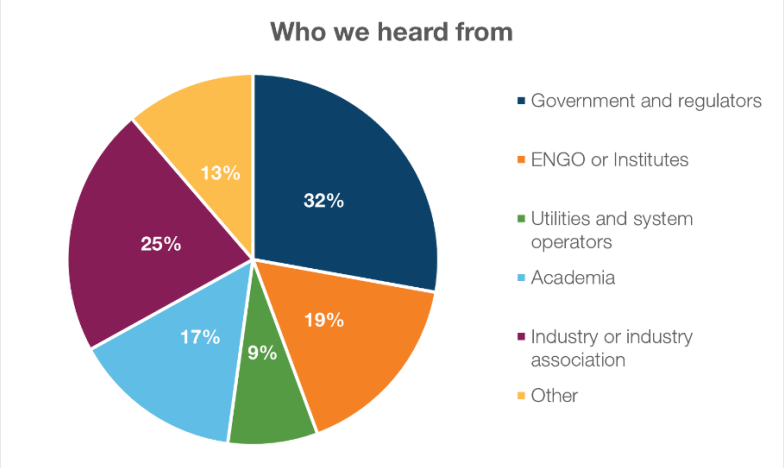
On June 20, 2024, the CER released a Discussion Paper and Survey to solicit feedback and insights from Canadians. This summary report highlights the key themes and comments that emerged from the Survey, while maintaining the confidentiality of respondents. The Survey responses provided valuable input that we are considering as part of our analysis.

We are committed to transparency in our modeling efforts.

Note that the CER's Canada's Energy Future series and its broader energy information work are distinct and independent from the CER's role in adjudicating and regulating energy infrastructure in Canada. As such, this engagement is an avenue to inform Canadians and gather feedback to refine the next version of Canada's Energy Future and is not a regulatory proceeding or inquiry.

Who we heard from

The CER received 61 responses from government, environmental non-governmental organizations (ENGOs) and institutes, utilities, academia, industry and industry associations, and others.



Source: EF2025 Discussion Paper and Survey

Description: This pie chart shows the type of organizations that respondents represented: 32% of the respondents were from the government and regulators, 19% from ENGO or institutes, 9% from utilities and system operators, 17% from academia, 25% from industry and industry associations, and 13% other.

What we heard

Many respondents appreciated the opportunity to provide input and supported the CER building off Energy Future 2023 to develop EF2025. Respondents provided their perspective and important insights on a wide range of energy technologies, infrastructure projects, and climate policies. The proposed approach to EF2025 received generally positive feedback, with many respondents expressing confidence in its direction. At the same time, we also received constructive criticism centered around ways to make the analysis more robust and beneficial to users.

The following sections distill the key themes identified in the responses. We are thoroughly evaluating all the feedback and will carefully determine what to integrate into our work— both for EF2025 and future CER Energy Information products— and how.

Overall approach

The overall EF2025 approach includes the assumptions, scenarios, sensitivities, modeling methodologies, and additional insights that will make up the report. When asked to comment on the overall approach, many respondents showed a significant enthusiasm for EF2025, noting that its data and insights are widely used to inform analysis and decision-making across Canada.

At a high level, the feedback on the overall approach emphasized a desire for a more comprehensive and nuanced approach to modeling net-zero scenarios for Canada. Most respondents highlighted the need for transparency and robustness in the modeling process, particularly in clearly outlining the assumptions behind each scenario. Similarly, respondents were eager to see different sensitivity analyses, to explore how changes in assumptions lead to changes in results. A few respondents also encouraged the CER to clearly articulate the nature of the Energy Future (EF) modeling exercise as scenario analysis, and not predictions of the future.

Additionally, several respondents highlighted the need for a more realistic representation of the interactions between energy system technologies, lifecycle impacts, and the challenges associated with policy integration into the modeling ecosystem. Respondents also indicated a strong interest in expanding the scope of EF2025 to capture a broader range of factors.

Expanded Scope

The Discussion Paper described parameters that will set the scope of EF2025, including incremental analysis on net-zero investment requirements, impacts on Canadians, Indigenous perspectives, as well as exploration of additional sensitivities. We asked respondents to describe the components of particular interest to them, and this is what we heard:

Renewable and non-emitting Energy

Renewable and non-emitting energy sources— particularly nuclear, renewable natural gas and hydrogen—were highlighted as critical areas of interest. Some respondents noted that these technologies could play a significant role in decarbonizing sectors like heavy-duty transportation, oil and gas, and industry, and that reflecting the opportunities and challenges of their integration would enrich the analysis.

The role of hydrogen in the future energy mix was a recurring topic of interest, with several respondents calling for detailed analysis on the production, distribution, and use of hydrogen as a key component of Canada's future energy mix. Likewise, geothermal energy was noted as a source to further explore in the outlook as well.

Economic Impacts

Numerous respondents emphasized the importance of examining the economic impacts of different energy scenarios. This includes assessing how shifts in energy production and use might affect households, as well as in key sectors such as oil and gas, manufacturing, and services.

Most respondents were supportive of exploring the impact of future energy scenarios on households and businesses and highlighted many factors that should be considered. For example, many noted the importance of looking at the impact on households' total energy costs involved in the transition, which involves both the increased spending on clean energy, but also the potential savings of moving away from conventional, and often less efficient, technologies. Several respondents also noted the importance of acknowledging the potential for energy costs to increase, given the significant amount of new investment needed to reach ambitious goals.

There was also interest in understanding the broader macroeconomic implications of transitioning to net-zero, including the effects on employment, economic growth, and regional economies. For example, some respondents expressed interest in understanding how unique regional circumstances in the territories would shape net-zero strategies and impact households and communities. Numerous participants also expressed that using our macroeconomic data projections for their own research is useful, and that understanding their underlying assumptions was important.

There were suggestions to further explore how energy developments could contribute to broader societal goals, such as reducing inequality, promoting sustainable development, and enhancing resilience to climate change.

Energy Efficiency and Electrification

Several respondents pointed to energy efficiency improvements as a major area of focus. They suggested that the report should further explore how advancements in technology could reduce energy consumption in both residential and industrial settings.

The role of electrification, particularly in transportation and industry, was also frequently mentioned. A few respondents highlighted the need for detailed projections on how increased electrification could impact energy demand and infrastructure requirements.

Key uncertainties

The Discussion Paper described the importance for EF2025 to explore uncertainties about Canada's energy future, including in the net-zero scenarios. We asked respondents to identify key topics of uncertainty that they think should be considered in the analysis.

Many respondents suggested that the net-zero scenarios would be more realistic if a broader range of uncertainties were incorporated into the modeling assumptions. Aspects such as extreme weather events, supply chain disruptions, regulatory and construction delays, global financial dynamics and technology advancements were mentioned. Additionally, there was a strong emphasis on the importance of considering a wide range of scenarios to reflect key uncertainties. Some respondents suggested that the report should include both optimistic and pessimistic outlooks, reflecting varying levels of technological advancement and policy implementation, to enhance the realism of the scenarios.

Global Financial Dynamics

A significant number of respondents stressed the need to address the impact of global financial trends, such as foreign direct investment in Canada's energy sector. They argued that understanding funding availability for existing and future energy projects is a key uncertainty, especially in the context of competition with other countries for foreign direct investments.

Technology Advancements and Grid Modernization

Respondents consistently highlighted the importance of considering advancements in emerging energy technologies, such as smart grids, energy storage, direct air capture, and carbon capture and storage (CCS). These technologies are widely seen by participants as critical enablers for achieving Canada's net-zero goals, with the caveat that their role will largely depend on their current and future costs.

In particular, the potential role of nuclear energy in achieving net-zero emissions was a recurring topic. Numerous respondents advocated for a deeper exploration of how nuclear power, including small modular reactors (SMRs), could contribute to Canada's energy mix.

Bioenergy was also mentioned as an emerging area of interest, with a few respondents suggesting that the report should assess the feasibility and sustainability of bioenergy as a low-carbon energy source.

Incorporating Indigenous Perspectives

The CER has been engaging actively with Indigenous communities from across Canada to better understand their various perspectives on Canada's energy future. In the Survey, we asked how best to engage with Indigenous Peoples and integrate their different perspectives into the report. Numerous respondents underscored the importance of conducting meaningful and inclusive engagement with Indigenous communities, while some also expressed the significant challenge posed by integrating complex Indigenous perspectives into modeling frameworks.

Several respondents emphasized that Indigenous communities are a key component of Canada's net-zero future, and that as such EF2025 should include their perspectives. For example, a few respondents suggested including a dedicated section where directly relevant topics such as Indigenous land rights, energy sovereignty, and the co-development of energy projects could be explored.

Data and Visualization

Beyond the report, the Energy Futures series provides a significant amount of supplementary documentation, data, interactive data visualization tools, and others.

When asked how the data and visualization tools could be improved, several respondents suggested that the report should prioritize making data more interactive and accessible. They proposed the development of online tools that allow users to explore different scenarios, visualize outcomes, and customize data presentations to suit their specific needs.

Similarly, feedback was given regarding the need for more accurate and transparent projection tools, particularly related to fuel costs, carbon pricing, and energy efficiency measures. A few respondents argued that improving the granularity and reliability of these forecasts would enhance the utility and transparency of the report.

Preliminary Assumptions

The Discussion Paper described our high-level preliminary assumptions for the different scenarios and sought feedback on these assumptions. For instance, the CER proposed relying on the International Energy Agency's (IEA) World Energy Outlook for international crude oil and natural gas assumptions, as in EF2023, and low carbon technology costs from a variety of public sources. We asked respondents to react to our proposed preliminary assumptions, and this is what we heard:

Transparency of Assumptions

The high-level preliminary assumptions used in the EF2025 report were generally well-received. However, there were consistent requests for more detailed explanations of these assumptions. Numerous respondents stressed the importance of explicitly stating the sources and rationale behind the key assumptions, stating that it would both further enhance the credibility of the report and make it easier for stakeholders to understand and evaluate the projections. Similarly, many respondents recommended that the report include a section that outlines the methodology underpinning the utilization of assumptions in the model.

Some respondents suggested that the report also discuss the limitations of the assumptions and how these might impact the overall findings. For example, while many respondents agreed with the use of the IEA's World Energy Outlook for the international assumptions, several questioned the use of a single agency to provide assumptions and the need to conduct additional sensitivities and/or consider a broader range of sources.

Broader Range of Scenarios

There was also feedback suggesting that the EF2025 report should consider a broader range of scenarios, including those that account for more extreme technological changes, policy shifts, or unexpected global events. This would help capture the full spectrum of possible futures.

Specifically, a few respondents proposed the inclusion of alternative scenarios that explore the consequences of slower-than-expected progress, or barriers to adoption of new technologies, in areas like renewable energy or carbon capture technology. Others emphasized the relevance of doing sensitivity analysis with different oil and gas prices.

Suggestions for Improvement

The Survey invited participants to offer specific suggestions to enhance the usability, relevance, and effectiveness of the Energy Futures series. As detailed below, the responses varied from calls for deeper exploration of emerging sociopolitical and technological developments to recommendations for greater accessibility of the report's assumptions and methodology.

Perspectives on Real-world Developments

Several respondents underscored the importance of monitoring emerging real-world developments. They particularly highlighted the impact of major infrastructure projects such as LNG export facilities, electricity transmission expansions, and carbon capture, utilization, and storage (CCUS) in shaping Canada's energy future. These projects are seen as pivotal in influencing emissions, economic growth, and regional development. A few respondents emphasized the need to assess the long-term viability of the proposed projects in the context of global energy markets and climate policies, and making informed assumptions based on these.

The interplay between policy decisions and market dynamics was also identified as crucial, with policy changes potentially influencing energy pathways by incentivizing or deterring specific technologies and practices. A few respondents recommended analyzing, and diving deeper, into how different policy scenarios could impact market behavior, investment, and progress toward net-zero emissions.

Climate change, energy security, international supply chains, and the affordability of energy for Canadians were also noted as key considerations for the Energy Futures series to integrate.

Enhancing Data Diversity and Accessibility

A common suggestion was to improve the accessibility of raw data, allowing users to perform their own analyses or explore the data in more depth. Numerous respondents stated that enhancing the accessibility and availability of data would enhance transparency and enable a wider range of stakeholders to engage with the report's findings. Some respondents recommended that the report provide clear guidance on how to access and use the data, including user-friendly formats and tools for data manipulation.

Similarly, several respondents emphasized the importance of making data visualizations not only accessible but also intuitive. They suggested that visualizations should be designed to convey complex information clearly and effectively, making it easier for non-experts to grasp key insights. There were also numerous suggestions for data and visualizations that highlight regional differences and sector-specific impacts, reflecting the diverse nature of Canada's energy landscape.

Ensuring Relevance and Effectiveness

Several respondents emphasized the importance of ensuring that the report remains relevant and effective for its intended audience. This includes regularly updating the content to reflect the latest research, technological developments, and policy changes. Some respondents suggested a more modular report structure, with sections that can be easily referenced or extracted for use in different contexts, such as policy discussions, academic research, or public outreach.

Closing and next steps

The feedback collected through this Survey is instrumental to better understanding the needs of the intended audience and is informing EF2025 and future CER analyses.

Respondents largely expressed support for the CER's initiative in energy modeling, with enthusiasm for the development of transparent net-zero pathways. They also emphasized the importance of continuing to engage with a diverse range of stakeholders and proactively monitoring emerging trends. Additionally, they expressed a strong desire for EF2025 to address complex questions related to climate policies, technologies, economic shifts, reconciliation with Indigenous peoples, socioeconomic impacts, and financing. The EF2025 team is thoroughly evaluating all the feedback received and will carefully determine what to reflect into our work, and how.

The CER thanks all respondents for their meaningful thoughts and feedback. The insights received as part of this exercise will be used to ensure that EF2025 is relevant and useful to Canadians.