



# Canada Energy Dashboard

**New interactive web tool based on full integration of macroeconomic and electricity modeling**

January 2024

Goals

Model  
Integration

Web interface demo

## Navius Research

Navius Research is a Vancouver-based consulting firm that uses energy-economy models to analyze the impacts of climate and energy policies. Our analytical framework is used by our clients across the country to inform energy and greenhouse gas abatement strategy.

## Our work

- Most provincial/territorial governments in Canada
- Impacts of the Emissions Reduction Plan - Canadian Climate Institute
- Net zero pathways for Canada – Clean Prosperity
- Potential of hydrogen to help decarbonize Yukon – Yukon government
- Role of bitumen beyond combustion in a net zero future – Alberta Innovates
- Clean energy jobs in a net zero future – Clean Energy Canada
- Energy transition scenarios for Canada – Public Policy Forum
- Canada Energy Dashboard – Natural Resources Canada

# Why did we develop the *Canada Energy Dashboard*?

A horizontal process flow diagram consisting of five chevron-shaped segments pointing to the right. The first segment is teal and empty. The second segment is orange and contains the word "Goals". The third segment is teal and contains the text "Model Integration". The fourth segment is teal and contains the text "Web interface demo". The fifth segment is teal and empty.

Goals

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- Canada has committed to achieve [net zero](#) emissions by 2050. We are increasingly asked to explore different possible net zero futures for Canada.
- Our previous modeling toolkit used a one-way integration between our macroeconomic model ([gTech](#)) and electricity model ([IESD](#)). [Full integration](#) improves our understanding of the implications of net zero for Canada's electricity sector and the cost of electrification across the economy.
- Canada is lacking publicly-available modeling resources for Canadians to explore alternative futures for our energy system and economy. [Natural Resources Canada](#) sponsored us to increase availability and accessibility of modeling resources by sharing model results on the Canada Energy Dashboard.

# How did we develop the *Canada Energy Dashboard*?

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**gTech** provides insight into how climate policy affects:

greenhouse gas emissions  
energy consumption  
technology adoption  
economic activity

Our in-house energy-economy model, **gTech**:

- Is a full computable general equilibrium (CGE) economic model
- Is technologically explicit and includes over 300 technologies
- Provides a comprehensive representation of all economic activity, energy supply and demand, and greenhouse gas emissions
- Represents 120 sectors of the economy and the interlinkages between them
- Provides extensive insight into the effects of climate and energy policy

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Our in-house electricity model, **IESD**:

- Is a capacity and dispatch model of Canada's electricity system
- Supplements gTech by representing dynamics unique to the electricity sector
- Represents hourly consumption and generation
- Can quantify the impact of policy and economic conditions on multiple criteria within the electricity sector

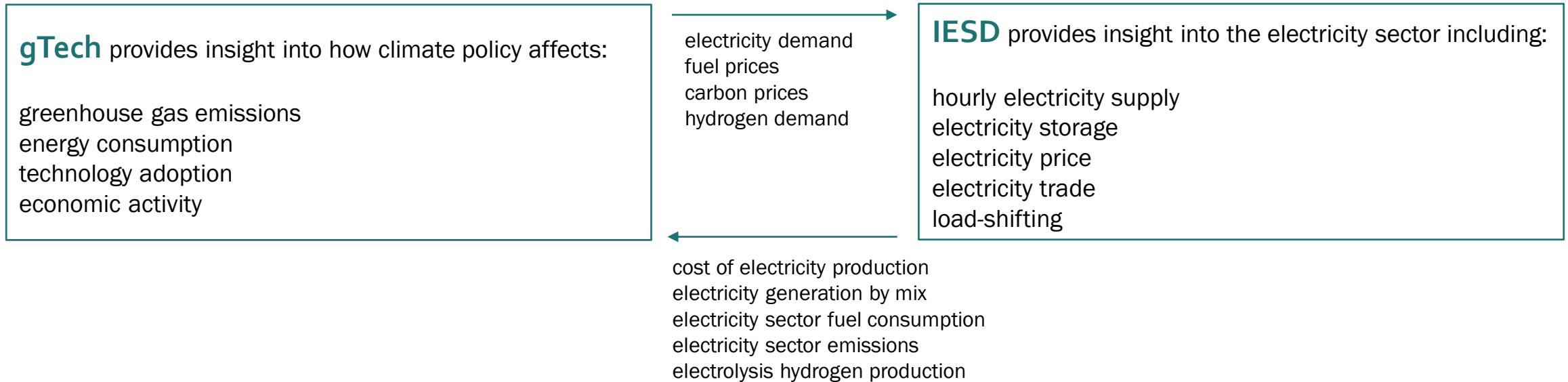
**IESD** provides insight into the electricity sector including:

hourly electricity supply  
electricity storage  
electricity price  
electricity trade  
load-shifting

# How did we develop the *Canada Energy Dashboard*?



The **full integration** sends information back-and-forth between gTech and IESD until they reach convergence



# How did we develop the *Canada Energy Dashboard*?



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The fully integrated gTech-IESD model allows us to answer broad questions like:

- What role will electrification play in the decarbonization of Canada's economy?
- How does the cost of electricity supply impact electricity demand?
- How does the cost of electricity supply impact Canada's economy?
- How do electricity generation and storage technology cost declines impact electrification outcomes across Canada?

And specific questions like:

- How does the adoption of electric heat pumps in buildings impact peak electricity load?
- How does the adoption of electric vehicles impact the cost of batteries for electricity storage?
- How do off-peak electricity prices impact the cost competitiveness of electrolysis hydrogen?

# Demo of the *Canada Energy Dashboard*

Goals

Model  
Integration

Web interface demo

<https://canadaenergydashboard.com/>



# What's next?

A horizontal process flow diagram consisting of five teal arrow-shaped segments pointing to the right. The second segment is labeled "Goals", the third is labeled "Model Integration", and the fourth is labeled "Web interface demo".

Goals

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Our goal is to create an annual Canada Energy Dashboard release similar to the US EIA's Annual Energy Outlook.

Updates will include:

- **Model updates:** recalibration to latest emissions inventory, policy updates, new technologies, new data, oil price forecasts
- **Dashboard updates:** regional granularity, new metrics, add to documentation
- **New scenarios:** announced policy, explore uncertainties

Thank you!

A horizontal process flow diagram consisting of five teal chevron-shaped arrows pointing to the right, connected by white gaps. The second, third, and fourth arrows contain the text "Goals", "Model Integration", and "Web interface demo" respectively.


Goals

Model  
Integration

Web interface demo

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<https://canadaenergydashboard.com/>

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