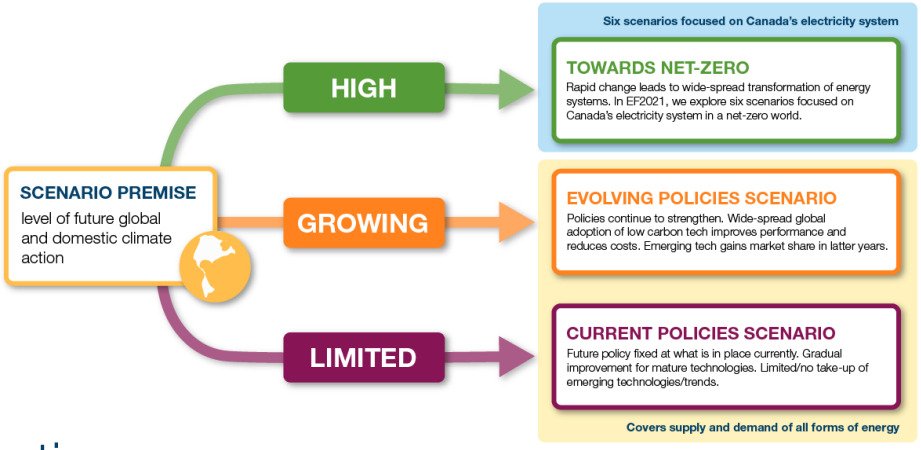
Overview

The Canada's Energy Future series explores how possible energy futures might unfold for Canadians over the long term. Canada's Energy Future 2021: Energy Supply and Demand Projections to 2050 (EF2021) is our latest long-term energy outlook.

Scenario Overview

In the long term, global and Canadian ambition to reduce greenhouse gas (GHG) emissions will be a critical factor in how energy systems evolve. EF2021 considers two main scenarios, where energy supply and demand projections differ based the level of future action to reduce GHG emissions. EF2021 also includes six additional scenarios that explore what Canada's electricity system might look like in a net-zero world.



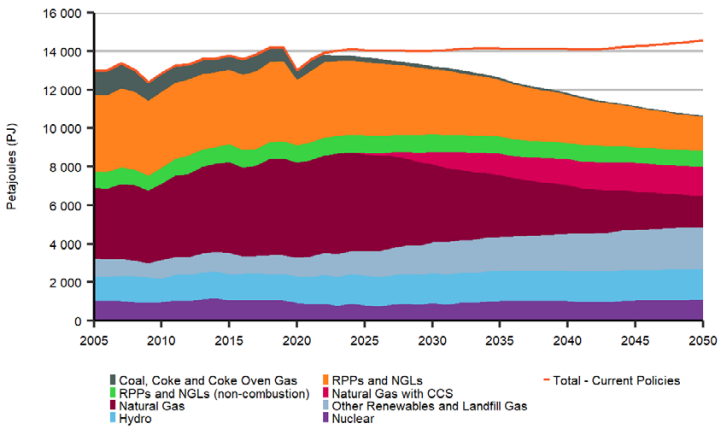
Price History and Assumptions

	2010	2015	2020	2025	2030	2035	2040	2045	2050
Crude Oil Price - Brent, 2020 US$ per barrel									
Evolving Policies	96	56	41	58	53	49	46	43	40
Current Policies	96	56	37	70	70	70	70	70	70
Natural Gas Price - Henry Hub, 2020 US$ per MMBtu									
Evolving Policies	5.50	2.80	2.00	3.15	3.24	3.39	3.54	3.59	3.64
Current Policies	5.50	2.80	2.00	3.21	3.40	3.65	3.90	4.15	4.40
Carbon Price, 2020 CDN$ per Tonne									
Evolving Policies	-	-	30	87	140	182	217	243	261
Current Policies	-	-	30	87	140	127	115	104	93

Results

Total Primary Energy Use

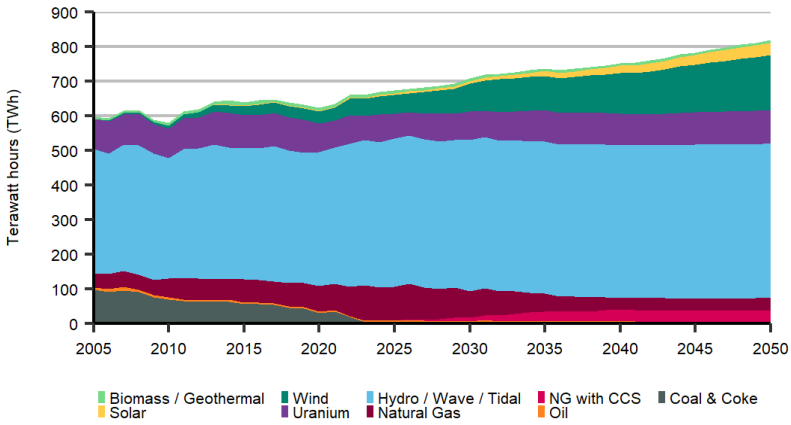
In the Evolving Policies Scenario, Canadians reduce their energy consumption and adopt lower carbon sources. Total primary energy use falls 21% from 2021 to 2050. Low and non-emitting sources of energy grow to make up the strong majority of energy use. Unabated fossil fuel combustion (fossil fuel combustion without carbon capture and storage) falls 19% from current levels by 2030, 45% by 2040, and 62% by 2050.



Total Generation by Energy Source - Evolving Policies Scenario

Canadians use more electricity from increasingly low-carbon sources. Despite total energy use declining by 21%, electricity demand grows 44% from 2021 to 2050 in the Evolving Policies Scenario, much of it from new areas such as electric vehicles and hydrogen production. Canada's electricity system also gets greener, going from 82% low and non-emitting in 2021 to 95% in 2050.

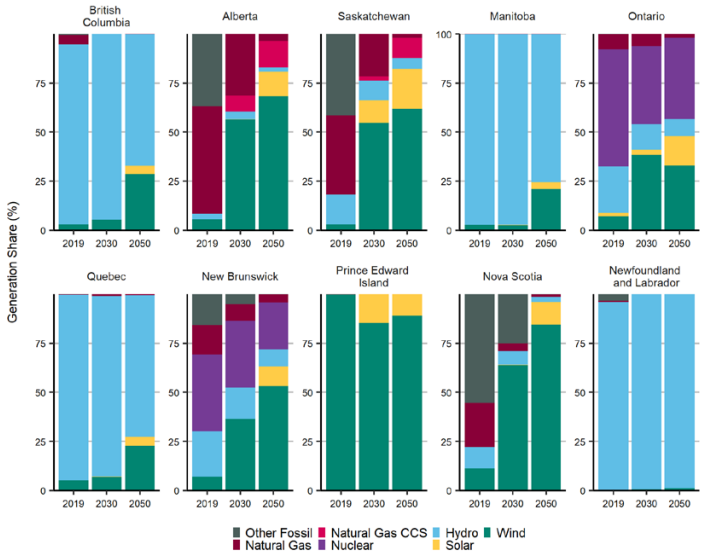
NG + CCS = Natural Gas with Carbon Capture & Storage



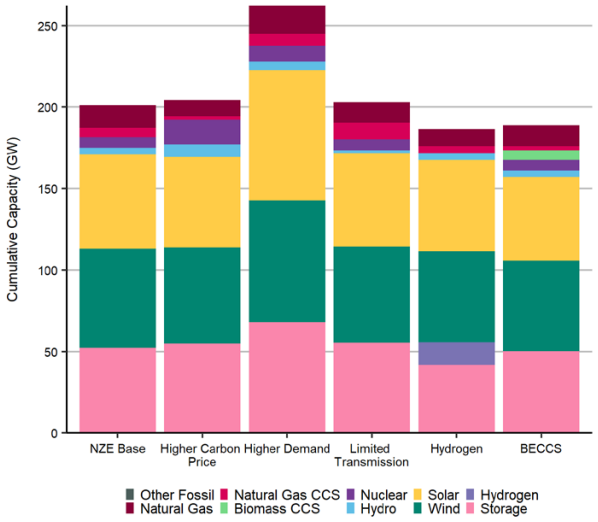
Net-Zero Electricity Scenarios

Wind, solar, and battery storage dominate electric capacity additions in all six net-zero electricity scenarios, making up between 82-85% of added capacity. With rising levels of wind and solar, all scenarios require flexible generation sources to balance supply and demand. There are large differences in the types and capacities of flexible generation sources adopted among scenarios. The net-zero electricity scenarios suggest that Canadian power systems will continue to be very distinct across the country, even in a low carbon future.

Cumulative Capacity Additions to 2050, All Net-Zero Electricity Scenarios



Electricity Generation Share by Technology, Main Net-Zero Electricity Scenario



Oil and Gas Production

In the Evolving Policies Scenario, crude oil production grows much more slowly than in the past decade, growing 16% to a peak of 5.8 MMb/d in 2032. Afterwards, production declines slowly to 2050.

Investment in natural gas production is spurred by assumed liquified natural gas (LNG) exports in both scenarios. In the Evolving Policies Scenario, natural gas production remains relatively stable through much of the projection period before declining gradually to reach 13.1 bcf/d by 2050.