



Natural Resources
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Country Report – Canada: Biofuels policies, production, and use

Canada

Canada's Climate Plan

2016: Pan Canadian Framework (PCF)

- Canada's first-ever national climate plan that was developed with provinces and territories, and in consultation with Indigenous peoples.
- Goal: to meet Canada's emissions reduction targets, grow the economy, and build resilience to a changing climate.
- The plan includes a pan-Canadian approach to pricing carbon pollution, and measures to achieve reductions across all sectors of the economy.

2030: Exceed The Paris Agreement

- On December 12, 2015, Canada and 194 other countries reached the Paris Agreement, an ambitious and balanced agreement to fight climate change.
- The fully implemented Strengthened Climate Plan will enable Canada to exceed its current 2030 target - 30% reduction below 2005 levels.

2020: Canada's Strengthened Climate Plan (SCP)

- Builds on the efforts of the PCF, and contains 64 strengthened and new federal policies, programs and investments to cut pollution and build a stronger, cleaner, more resilient and inclusive economy.
- As part of the plan, the government announced \$1.5 billion investment in a Low-carbon and Zero-emissions Fuels Fund to increase the production and use of low-carbon fuels (e.g., hydrogen, biocrude, renewable natural gas and diesel, cellulosic ethanol) in a manner that complements federal carbon pollution pricing, regulatory efforts and other federal programming.

2050: Net-Zero Emissions Economy

- To set Canada on a path to achieve a prosperous net-zero emissions future by 2050, the Government of Canada introduced the proposed Canadian *Net-Zero Emissions Accountability Act*, in Parliament on November 19, 2020.
- The act will formalize Canada's target to achieve net-zero emissions by the year 2050, and establish a series of interim emissions reduction targets at 5-year milestones towards that goal.



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Federal Clean Fuel Regulations (CFR)



- The Clean Fuel Regulations (CFR) will complement the Pan-Canadian approach to pricing carbon pollution and will focus on reducing carbon intensity across the lifecycle of fuels, from production to use, reducing GHGs along the value chain of individual fuels and incenting innovation and technology.
- The regulation will be performance based, requiring a percentage reduction in carbon intensity of liquid fossil fuels, which will be based on a life cycle analysis approach.
- The goal is to achieve GHG reductions of 20 Mt annually by 2030.



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Carbon Pollution Pricing System



- A price on carbon pollution is an essential part of Canada's plan to fight climate change and grow the economy.
- In October 2016, the Prime Minister announced the Pan-Canadian Approach to Pricing Carbon Pollution (the federal benchmark).
- Under the Greenhouse Gas Pollution Pricing Act, adopted on June 21, 2018, the federal carbon pollution pricing system has two parts:
 - a trading system for large industry, known as the output-based pricing system
 - a regulatory charge on fuel (fuel charge)
- 2021 Price = \$40; 2022 Price = \$50 then \$15/yr increase until 2030 Price = \$170
- All direct proceeds from carbon pollution pricing under the federal system will be returned to the jurisdiction in which they were generated.



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Renewable & Low-Carbon Fuel Regulations

British Columbia (BC)

Renewable
Content In
Gasoline

5%

Renewable
Content In
Diesel

5%

CleanBC Plan
20% fuel CI reduction
from 2010 by 2030

Alberta (AB)

Renewable
Content In
Gasoline

5%

Renewable
Content In
Diesel

2%

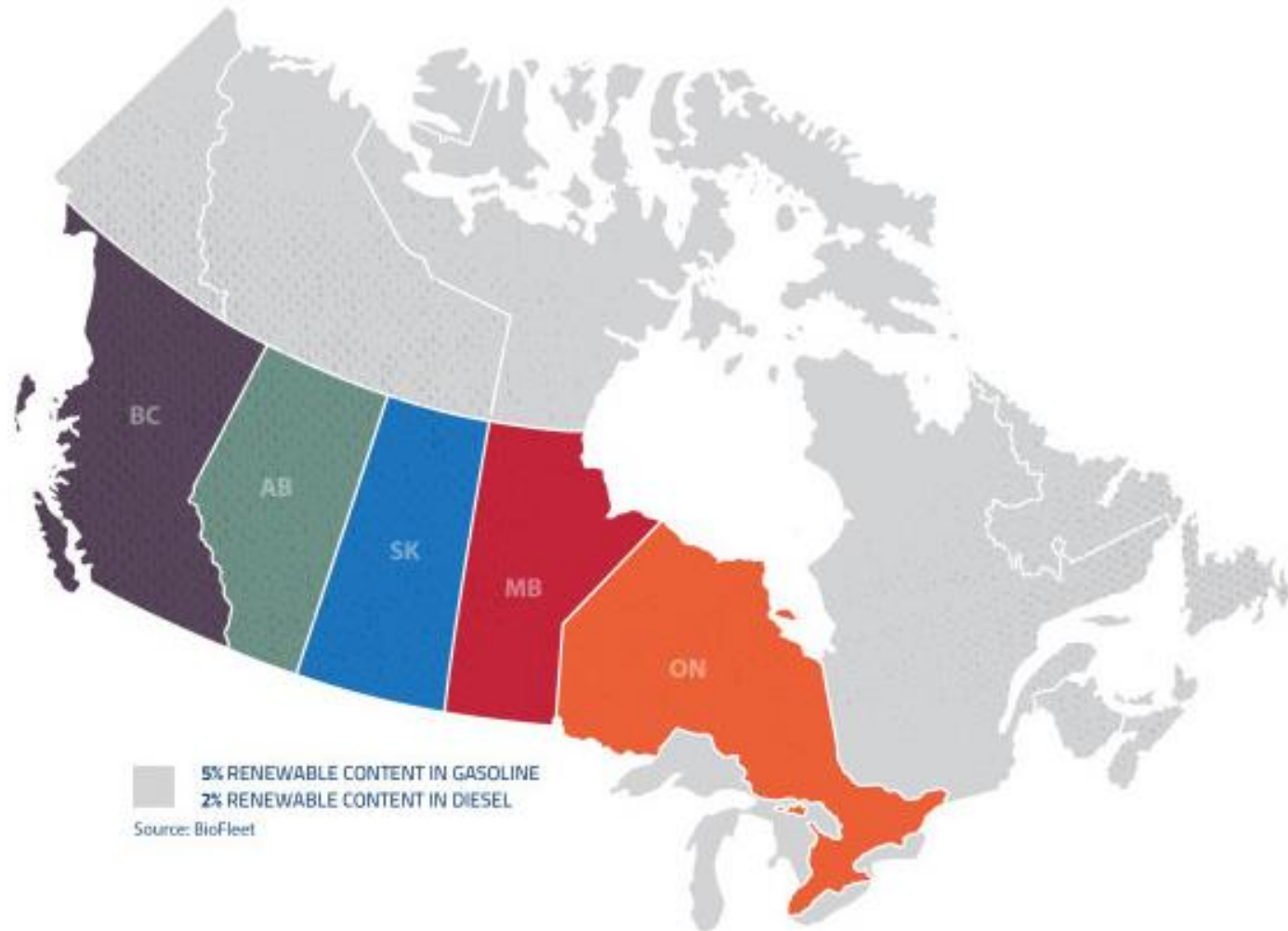
Saskatchewan (SK)

Renewable
Content In
Gasoline

7.5%

Renewable
Content In
Diesel

2%



Manitoba (MB)

Renewable
Content In
Gasoline

9.25%

Renewable
Content In
Diesel

3.5%

Jan. 1, 2022 new min. blends:
gasoline = 10% / diesel = 5%

Ontario

Renewable
Content In
Gasoline

10%

Renewable
Content In
Diesel

4%

Gradual increase to 15%
gasoline blend in 2030

Quebec

Renewable
Content In
Gasoline

10%

Renewable
Content In
Diesel

2%

2025 new min. blends:
gasoline = 15% / diesel = 4%

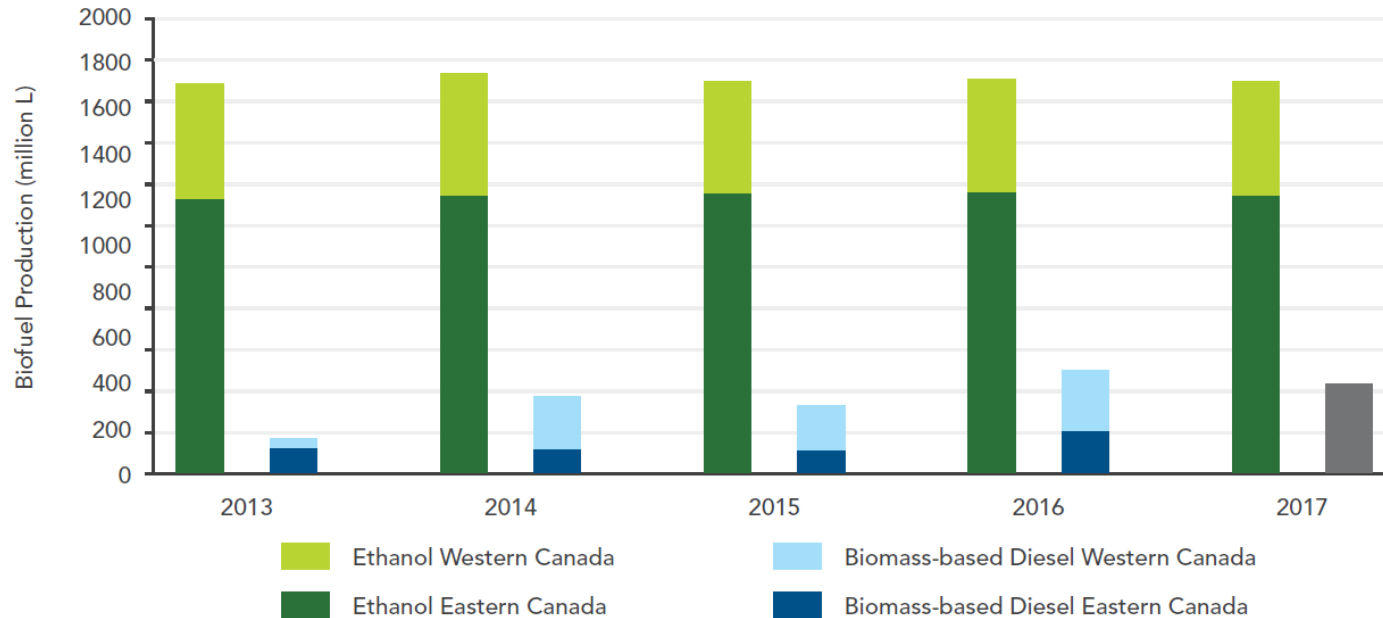


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Biofuel Production in Canada



Fuel	Capacity (ML/yr)	# of Plants
Ethanol	2,145	14
Biodiesel	629	6
Renewable Fuel Oil	51	2
Renewable Diesel	0	0
Total	2,825	22

Source (Table & Graph): Advanced Biofuels Canada, 2020

- Given the availability of agricultural feedstocks and an interest to support rural development, a large portion of Canada's ethanol demand is met through domestic production.
- There are currently 14 operating ethanol plants in Canada with an estimated 2.1 billion liters of annual production capacity, which represents about 70% of total ethanol demand.
- On average, the United States supplies 98% of Canada's ethanol imports. As Canada imports ethanol to meet the federal blend mandate, there are generally no ethanol exports.
- Canada currently has no renewable diesel production capacity and relies solely on imports from the US, EU and Singapore (2018 consumption was 343 ML).

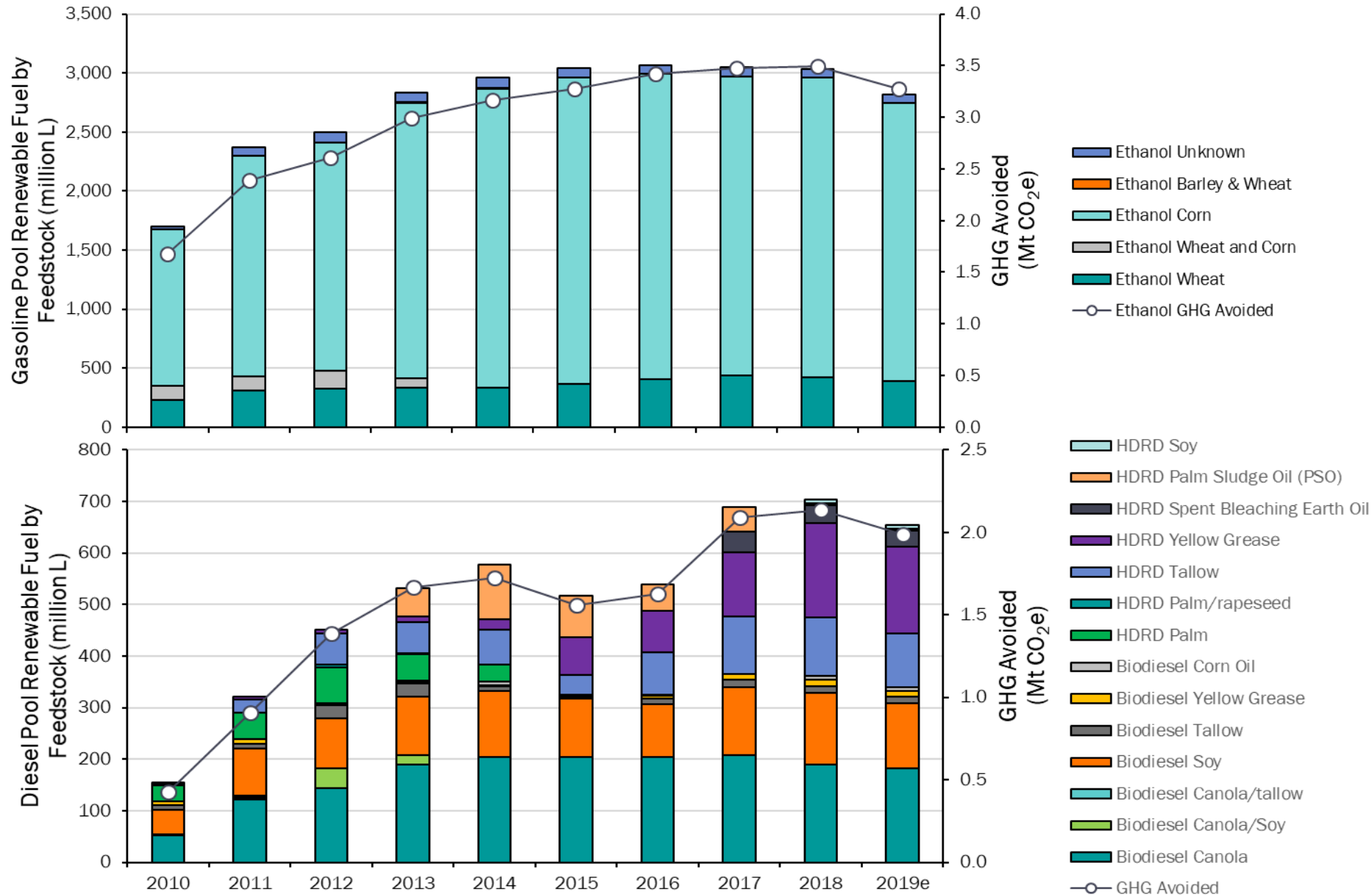


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Biofuels Use in Canada, 2010-2019



- ~50% of Canada's ethanol consumption is imported from the US
- ~85% of domestic biodiesel production is exported to the US
- The estimate for 2019 is only 2,817 million litres, where the reduction is a result of lower overall reported fuel consumption for that year.

International Engagement



- Canada played a leadership role in the first phase of Mission

Innovation. From 2016-2020, Canada co-led the Sustainable Biofuels Innovation Challenge ('IC4') – 16 countries looking to make progress towards implementing affordable, advanced biofuels for transportation and industrial applications.

Currently, Canada is exploring opportunities to contribute to the next phase of Mission Innovation ('MI 2.0').



- Canada is a co-lead country of the Clean Energy

Ministerial Biofuture Initiative, which formally launched a CEM11. The intent is to accelerate the deployment of advanced low carbon fuels, biochemicals and biomaterials



- Canada is one of 23 countries participating in the Global

Bioenergy Partnership (GBEP). GBEP was established to implement a Plan of Action to support "biomass and biofuels deployment, particularly in developing countries where biomass use is prevalent".



- In 2019, Canada officially joined the International Renewable Energy

Agency (IRENA). IRENA is an intergovernmental organisation that supports countries in their transition to a sustainable energy future, and serves as the principal platform for international cooperation, a centre of excellence, and a repository of policy, technology, resource and financial knowledge on renewable energy.



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Fiscal Incentives and Investment Support

Fundamental
Research

Technology Development

Commercialization /
Production

Distribution /
Infrastructure

End-Use /
Demand

Export /
Trade

Knowledge Development

Technology Development

Business Development

Agriculture and Agri-Food Canada

Business Development Bank of Canada

Canada Infrastructure Bank

ECCC

Export Development Canada

Global Affairs Canada

Innovation, Science and Economic Development Canada

National Research Council

Natural Resources Canada

NSERC

TBS

- AAFC: Agriculture and Agri-Food Canada
- BDC: Business Development Bank of Canada
- CIB: Canada Infrastructure Bank
- ECCC: Environment and Climate Change Canada
- EDC: Export Development Canada
- GAC: Global Affairs Canada
- ISED: Innovation Science and Economic Development Canada
- NRC: National Research Council
- NRCan: Natural Resources Canada
- NSERC: Natural Sciences and Engineering Research Council of Canada
- TBS: Treasury Board of Canada Secretariat

Feedstock – Conversion Pathways – End Use

Note: Refer to appendix for links to programs. The list in the appendix is not exhaustive.

The Sky's the Limit Challenge

- X-prize type model to source a breakthrough in Green Aviation fuels

 **ITINERARY**

FEBRUARY 1, 2019	DEADLINE TO SUBMIT YOUR PLAN
MAY 29, 2019	TOP FOUR TEAMS ANNOUNCED
AUGUST 1, 2021	10L OF BIOJET FUEL PRODUCED
BY SPRING 2022	GRAND PRIZE WINNER ANNOUNCED

The best 4 teams are receiving
up to a **\$2M Prize**



- Carbon Engineering (AB)
- Enerkem (QC)
- FORGE Hydrocarbons (AB)
- SAF+ Consortium (QC)



The team with the most economically and environmentally sustainable approach for commercial-scale sustainable aviation fuel production in Canada will receive a **\$5M Prize**



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Fiscal Incentives and Investment Support

Various types of government support have been provided in Canada for biofuels, spanning across all stages of biofuel supply chain:

- Agriculture and Agri-Food Canada (AAFC)
 - [Agricultural Clean Technology Program](#)
 - [AgriInnovate Program](#)
 - [AgriScience Program](#)
- Business Development Bank of Canada (BDC):
 - [Cleantech Practice](#)
- Canada Infrastructure Bank (CIB)
 - [Clean Power Sector](#)
- Environment and Climate Change Canada (ECCC):
 - [Climate Action Incentive Fund \(CAIF\)](#)
 - [Low Carbon Economy Fund \(LCEF\)](#)
- Export Development Canada (EDC):
 - [Risk Management & Financing](#)
- Global Affairs Canada:
 - [CanExport](#)
 - [Canadian International Innovation Program \(CIIP\)](#)
 - [Going Global Innovation \(GGI\)](#)
 - [Trade Commissioner Service – Clean Technologies](#)
- Innovation, Science and Economic Development (ISED):
 - [Innovation Superclusters Initiative](#)
- [Regional Development Agencies \(RDA\) Programming](#) (CanNor, WD, FedNor, FedDev Ontario, CED, ACOA)
- [SD Tech Fund](#)
- [Strategic Innovation Fund \(SIF\)](#)
- National Research Council (NRC):
 - [Industrial Research Assistance Program \(IRAP\)](#)
- Natural Resources Canada (NRCan):
 - [Clean Energy for Rural and Remote Communities Program \(CERRC\)](#)
 - [Clean Growth in Natural Resource Sectors Program \(CGP\)](#)
 - [Energy Innovation Program \(EIP\)](#)
 - [Forest Innovation Program \(FIP\)](#)
 - [Impact Canada: The Sky's the Limit Challenge \(STL\)](#)
 - [Indigenous Forestry Initiative \(IFI\)](#)
 - [Investments in Forest Industry Transformation \(IFIT\)](#)
 - [Program of Energy Research and Development \(PERD\)](#)
 - [Zero-emissions Fuels Fund](#)
- Natural Sciences and Engineering Research Council of Canada (NSERC)
 - [Alliance Grants](#)
- Treasury Board of Canada Secretariat:
 - [Greening Government Strategy](#)

Note: this list is not exhaustive



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