IEA Bioenergy
Technology Collaboration Programme

Task 39
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Country Update: Canada

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Task 39 Business Meeting
12-13 September 2022

Summary of Biofuels Policies in Canada

- **"Market-pull" policies**
  - **Federal and Provincial Renewable Fuel Regulations:** blending mandates- (mainly support the use of conventional biofuels (ethanol and biodiesel)
  - **British Columbia's Low Carbon Fuel Standard** (BC LCFS): focus on the carbon intensity of fuels- (technology/alternative fuels agnostic)
  - **Federal Clean Fuel Regulations:** focus on the carbon intensity of fuels- (technology/alternative fuels agnostic)
  - **Carbon Pollution Pricing:** makes fossil fuels more expensive to buy
- **"Technology-push" policies**

There are various types of government support for biofuels, spanning across all stages of the biorefining process

- RD&D -Grants and low-interest loans
- Business planning- Grants for feasibility studies and market development
- Plant construction- Grants and low-interest loans, accelerated depreciation
- Production- Fuel tax exemptions, producer payments
- Distribution- Grants for storage and distribution infrastructure
- Consumption-Tax-breaks for the purchase of biofuel-consuming vehicles

Renewable Fuel Regulations- Blending Mandates

British Columbia (BC)

Renewable Content In Gasoline	Renewable Content In Diesel
5%	4%

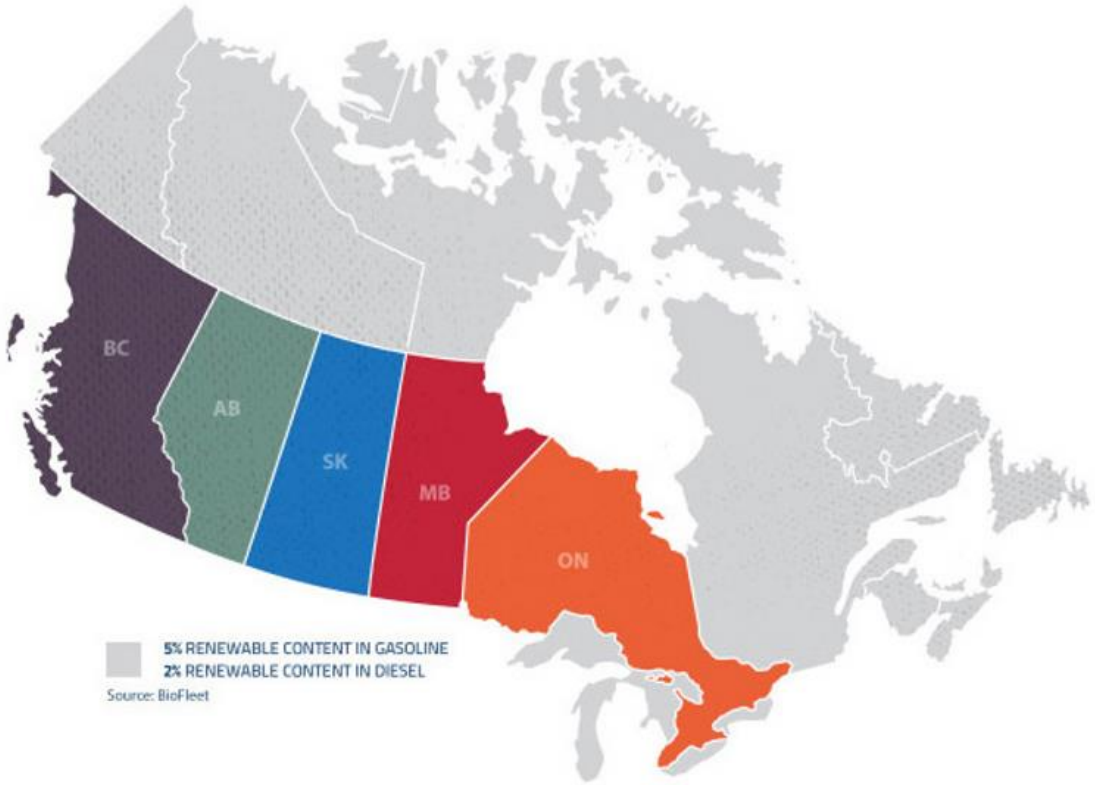
CleanBC Plan
20% fuel CI reduction from 2010 by 2030

Alberta (AB)

Renewable Content In Gasoline	Renewable Content In Diesel
5%	2%

Saskatchewan (SK)

Renewable Content In Gasoline	Renewable Content In Diesel
7.5%	2%



Manitoba (MB)

Renewable Content In Gasoline	Renewable Content In Diesel
9.25%	3.5%

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

Ontario

Renewable Content In Gasoline	Renewable Content In Diesel
10%	4%

Gradual increase to 15% gasoline blend in 2030

Quebec

Renewable Content In Gasoline	Renewable Content In Diesel
10%	2%

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

- From 2006 through 2010, the Provinces of British Columbia, Alberta, Saskatchewan, Manitoba and Ontario established blending requirements of 5 to 8.5% for ethanol in gasoline and 2 to 4% for renewable content in diesel
- Since 2010/2011, federal regulations have required an average ethanol content of at least 5% based on the volume of gasoline and at least 2%, on average, renewable content based on the volume of diesel fuel and heating distillate oil

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British Columbia's Low Carbon Fuel Standard (BC LCFS)

- The BC LCFS is one of the worlds most successful transport emission reduction legislative measures, derived from the California LCFS approach

- The BC LCFS consists of both renewable fuel volume requirements and lifecycle carbon intensity (CI) reduction targets.

- The BC LCFS has successfully reduced BC's transport derived annual greenhouse gas emissions by an average of 6% per year between 2010 and 2020. The policy will also help the Province reduce its carbon emissions by a further 31%, allowing it to meet its 2030 greenhouse gas reduction targets.

Carbon intensity reduction goals in road transportation fuels in BC LCFS (BC MEMLCI, 2020)

Compliance Period	Carbon Intensity Limit for Diesel Class Fuel g CO2e/MJ)	Carbon Intensity Limit for Gasoline Class Fuel g CO2e/MJ)
Baseline	94.76	88.14
2018	88.60	82.41
2019	87.18	81.09
2020	86.15	80.13
2030	75.81	70.51

Federal Clean Fuel Regulations (CFR)

- The Clean Fuel Regulations is a Low Carbon Fuel Standard type policy that the Federal Government recently implementing (July 2022) to transition from volumetric-based requirements towards a carbon intensity-based approach

- The Regulations will require the primary suppliers of liquid fossil fuels, including gasoline and diesel, to reduce the carbon intensity (CI) of their fuels from, 2016 CI levels by 2.4 gCO2e/MJ in 2022, increasing to 12 gCO2e/MJ in 2030.

- The Regulations will also establish a credit market where the annual CI reduction requirements will be met via three main categories of credit-creating actions summarised below:

Compliance category 1: reduction to lifecycle carbon intensity of fossil fuels	Compliance category 2: supplying low carbon intensity fuels	Compliance category 3: investing in advanced vehicle technologies

Newly developed LCA model used within the Clean Fuel Regulations (CFR)

- The evolving Canadian Clean Fuel Regulations (CFR) includes a new LCA model to assess the CI of alternative fuels. The LCA model has been developed and will be administrated by Environment and Climate Change Canada (ECCC).
- The ECCC model uses Open LCA software which will be used to assess the overall sustainability and Life Cycle Assessment (LCA) of various fuel pathways.
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- ECCC's LCA Model and methodology were released in June 2022.
- The new LCA model will be used as the basis to ensure compliance with the Clean Fuel Regulations (CFR).

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Federal Carbon Pollution Pricing

- Under the Greenhouse Gas Pollution Pricing Act, carbon pollution pricing has two parts:
  - a trading system for large industries, known as the output-based pricing system
  - a regulatory charge on fuel (fuel charge)
- 2021 Price ($/tCO2e) = 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 to support low carbon initiatives and projects (thus, revenue neutral)

Impact of the federal carbon pricing on the retail price of transportation fuels (Advanced Biofuels Canada, 2021)

Year	2022	2025	2030
Carbon Price ($CAD/tCO2$_{eq}$)	50	95	170
Gasoline ($CAD/liter)	0.11	0.21	0.79
Diesel ($CAD/liter)	0.13	0.25	0.46
Biofuels ($CAD/liter)*	0.00	0.00	0.00

* Full exemption if blend exceeds 10% in gasoline and 5% in diesel

Recent "technology-push" programs to support biofuel development

- In December 2020, the Government of Canada released its strengthened federal climate plan, A Healthy Environment and a Healthy Economy.
- The plan describes new and established federal policies, programs and investments aimed at cutting pollution and building a stronger, cleaner, more resilient and inclusive economy.

CLEAN FUELS FUND:

An investment of **$1.5 billion** over five years to grow Canada's clean fuels market by:

Building new domestic production capacity

Establishing biomass supply chains

Develop enabling codes and standards

SIF NET ZERO ACCELERATOR:

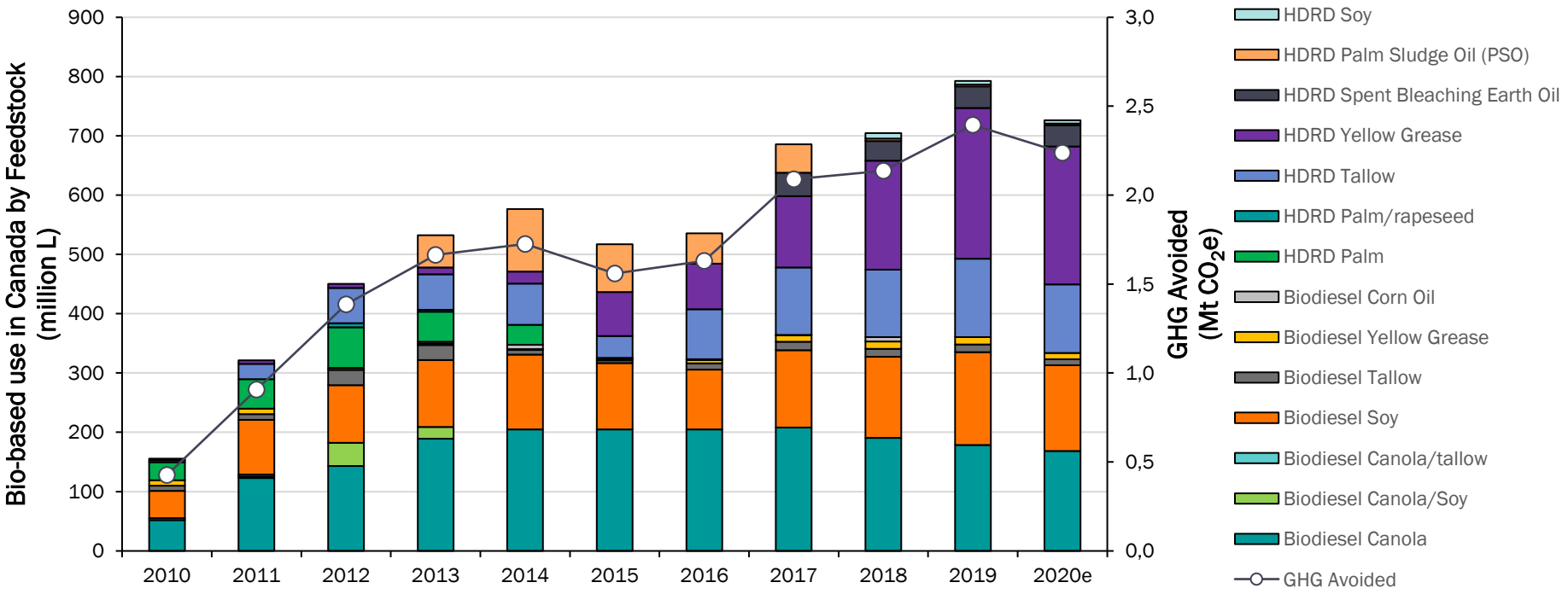
Up to **$8 billion** to transform the economy for clean and long term growth

Invests in clean energy technologies

Drives the creation of good-paying jobs

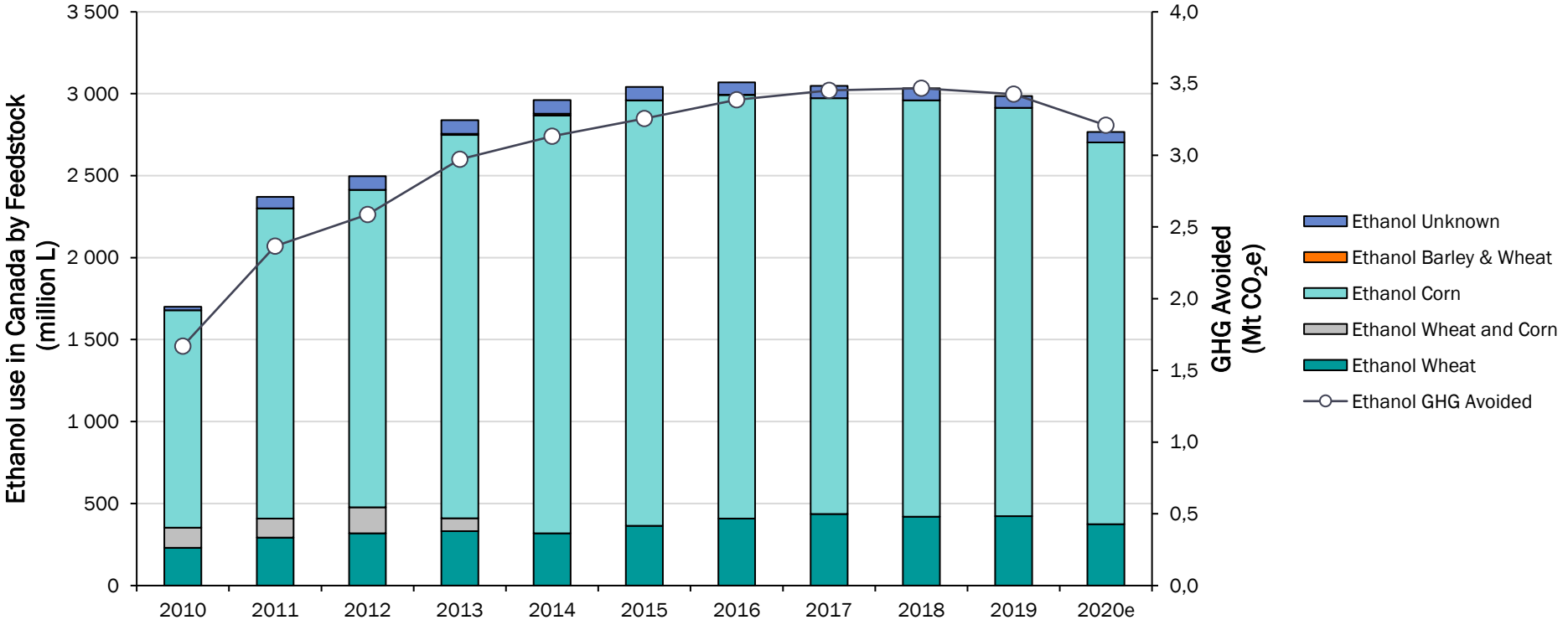
Mitigates the effects of climate change

Biobased Diesel Market in Canada



- Biobased diesel (biodiesel and renewable diesel) use has increased from 160 million liters in 2010 to about 730 million liters in 2020 (an average annual increase of 20%).
- About 460 million liters of biodiesel is produced in Canada. Most of the Canadian biodiesel production is exported to the US due to supporting policies. These include the federal RFS and blender tax credit as well as the California/Oregon Low Carbon Fuel Standard (LCFS).
- Currently, there is no renewable diesel production in Canada. Canada has been importing over 300 million liters of renewable diesel annually in recent years.
- The primary feedstocks used in Canada for biodiesel production is canola (50%), followed by soybean (43%).

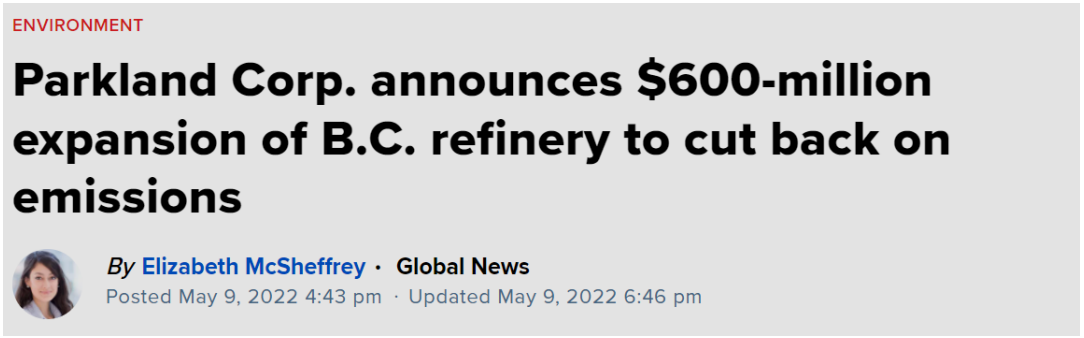
Ethanol Market in Canada



- Ethanol use in Canada has been nearly constant since 2015, in the range of 2.7-3.0 million liters
- About 1.7 million liters of ethanol is produced in Canada. The remaining portion of ethanol is mainly imported from the USA.
- The primary feedstock used in Canada for ethanol production is corn (85%) and wheat (13%).

Co-processing

- Both British Columbia's Low Carbon Fuel Standard and the federal Clean Fuel Regulations have encouraged Canadian oil refineries to consider co-processing as an economically attractive compliance pathway.
- Parkland oil refinery is already routinely co-processing low-carbon intensity lipids. This refinery was the first facility in Canada to use its existing infrastructure and equipment to co-process bio-feedstocks such as canola oil, and oil derived from animal fats (tallow) to produce lower carbon intensive (CI) fuels.
- Both BC's oil refineries have announced plans to expand their co-processing and stand-alone renewable diesel production capacities



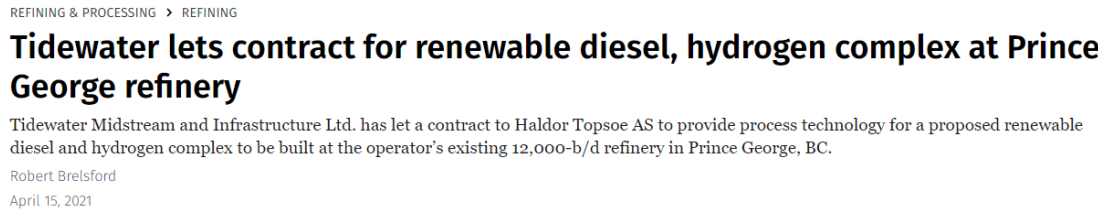
ENVIRONMENT

Parkland Corp. announces $600-million expansion of B.C. refinery to cut back on emissions

By Elizabeth McSheffrey · Global News

Posted May 9, 2022 4:43 pm · Updated May 9, 2022 6:46 pm

Parkland will increase co-processing to 5,500 bpd & additional "standalone" unit producing 6,500 bpd



REFINING & PROCESSING › REFINING

Tidewater lets contract for renewable diesel, hydrogen complex at Prince George refinery

Tidewater Midstream and Infrastructure Ltd. has let a contract to Haldor Topsoe AS to provide process technology for a proposed renewable diesel and hydrogen complex to be built at the operator's existing 12,000-b/d refinery in Prince George, BC.

Robert Brelsford

April 15, 2021

Tidewater will include a pretreatment plant to allow increased flexibility for processing of various renewable feedstocks producing 3,000 b/d of renewable diesel from a mix of 100% biomass-based feedstocks

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Thanks, Questions?

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https://www.bc-smart.ca/

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