LOW CARBON FUEL REQUIREMENTS IN BRITISH COLUMBIA

ISCC Sustainability Workshop
San Francisco, March 24, 2017
Reducing fuel GHG emissions in B.C.

- Revenue-neutral carbon tax
  - Applies to most fuels used for transportation, heating, industry
  - Price: $30/tonne CO$_2$e

- Renewable fuel requirements
  - Applies to gasoline, diesel, heating oil

- Low carbon fuel requirements
  - Applies to fuels suitable for use in transportation
  - Carbon intensity reductions 10% by 2020, 15% by 2030
  - Price: market-based
# Reducing transportation fuel GHG emissions in B.C.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>2007</td>
<td>B.C. Energy Plan and MOU with California</td>
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<td>2008</td>
<td><em>Greenhouse Gas Reduction (Renewable and Low Carbon Fuel Requirements) Act</em> passed</td>
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<td>2010</td>
<td>Renewable and Low Carbon Fuel Requirements Regulation in force</td>
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<td>2011</td>
<td>Stakeholder consultations</td>
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<td>2012</td>
<td>Amendments to improve the Act and Regulation</td>
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<td>2013</td>
<td>Pacific Coast Collaborative (B.C., Washington, Oregon, California) commitment to align LCFS policies</td>
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<td>2014</td>
<td>Stakeholder consultations validated the achievability of the targets</td>
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<td>2016</td>
<td>Amendments to improve Regulation reporting requirements</td>
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<td>2017</td>
<td>Consultations regarding the implementation of 15% by 2030</td>
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**B.C. renewable fuel requirements**

**Gasoline**
- 5% volume requirement
- 2015 supply (7.1% volume)

- Ethanol: 7.1%
- Gasoline: 92.9%

**Diesel**
- 4% volume requirement
- 2015 supply (6.2% volume)

- Biodiesel: 2.8%
- HDRD: 3.4%
- Diesel: 93.8%
What is a Low Carbon Fuel Standard?

• Market-based regulatory approach to reducing the lifecycle carbon intensity of fuels

• Fuel suppliers receive **debts** for fuels with a higher carbon intensity than the current limit

• Fuel suppliers accrue **credits** for fuels with a lower carbon intensity than the current limit

• Credits can be traded between fuel suppliers

• Petroleum fuel suppliers can choose their strategy for achieving compliance with B.C.’s LCFS
  – Supply increasing quantities of low carbon fuels
  – Buy credits from low carbon fuel suppliers
    (average market price = $170/credit)
  – Earn credits through Part 3 Agreements

• A net debit balance at the end of the compliance year results in a penalty of $200/debit
Lifecycle of a transportation fuel
Relative carbon intensity of renewable and low carbon fuels in B.C.
10% Scenario

Fossil fuel supplier action
Other fuel supplier action
Part 3 Agreements
Banked credits

6.5% Ethanol @ 49.48
2.8% Biodiesel @ 15.62
3.3% HDRD @ 17.02
250 CNG HDV
125 LNG HDV
2,710 electric LDV

7.9% Ethanol @ 30.88
3.5% Biodiesel @ 15.00
4.4% HDRD @ 15.00
1,016 CNG HDV
125 LNG HDV
21,159 electric LDV

9.7% Ethanol @ 19.27
4.2% Biodiesel @ 15.00
8.5% HDRD @ 15.00
4,149 CNG HDV
125 LNG HDV
96,743 electric LDV

11.8% Ethanol @ 12.02
5.1% Biodiesel @ 15.00
10.1% HDRD @ 15.00
17,003 CNG HDV
125 LNG HDV
232,883 electric LDV
Energy Mix

2015

- Gasoline: 51.1%
- Diesel: 42.8%
- Electricity: 0.2%
- CNG: 0.0%
- Hydrogen: 0.0%
- Biodiesel: 1.2%
- HDRD: 1.5%
- Ethanol: 2.6%

2027

- Gasoline: 37.3%
- Diesel: 49.0%
- Electricity: 0.5%
- CNG: 2.9%
- Hydrogen: 0.3%
- Biodiesel: 2.3%
- HDRD: 4.1%
- Ethanol: 3.0%
Energy Mix

Percentage change in liquid fuel demand

HDRD
Biodiesel
Ethanol
Diesel
Gasoline
Where are we seeing activity?

Concepts/projects active in B.C.
- Canfor/Licella joint venture
- Ensyn
- Highbury Energy
- Carbon Engineering
- Metro Vancouver
- Refinery co-processing

- Others are looking at the opportunities for their technology in B.C.
  (including proponents for converting natural gas to gasoline)
Canada’s Clean Fuel Standard

On November 25, 2016, Minister McKenna announced that the Government will develop a clean fuel standard that “will be a made-for-Canada approach that will provide flexibility to industry in how they innovate and how they reduce emissions throughout the fuel system.” The clean fuel standard is also part of the Pan-Canadian Framework.

A clean fuel standard would require reductions in the lifecycle carbon intensity of fuels supplied in a given year, based on lifecycle analysis and would address a broad suite of fuels, including liquid, gaseous and solid fuels. It would go beyond transportation fuels to include those used in industry, homes and buildings and the approach would not differentiate between crude oil types produced in or imported into Canada.
Canada’s Clean Fuel Standard

• A clean fuel standard would be flexible, and it would promote the use of clean technology, lower carbon fuels, and promote alternatives such as electricity, biogas, and hydrogen.

• The overall objective of a clean fuel standard is to achieve annual reductions of 30 megatonnes (Mt) of GHG emissions by 2030.
Thank you

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