Cost of Compliance with Carbon Regulations for Canada’s Rail and Truck Sectors

Based on work conducted for the Railway Association of Canada

November 20, 2017

credit: CN Rail
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- McDonald's
- Capital Power Corporation
- Enbridge
- TransAlta
- Union Gas
- Cosia
- NOVA Chemicals
- Sanofi Pasteur
- Intact
- Kruger Products
Study Objectives & Outcomes

A | Analysis
  | Existing Policies
  | • Carbon Tax
  | • Carbon Levy
  | • Cap + Trade

F | Forecasts
  | Compliance costs
  | • Jurisdiction
  | • Carrier type

P | New Policies
  | Implication of Clean Fuel Standard
Key Caveats

1. Study was conducted for the Railway Association of Canada, who provided and reviewed rail fuel consumption. Truck fuel consumption was taken from government sources and results are unreviewed by members of the trucking industry.

2. Analysis is from early 2017 and does not include more recently evolving policy.

3. Costs are meant to be indicative, as they are based on assumptions and speculation. At the time of the study, very few details were available on the Canadian CFS.
Transportation in Context

GHGs by Economic Sector from Canada’s Inventory Report 1990-2014
Methodology

• Fuel consumption estimated in each province
  – Rail provided by RAC
  – Truck energy use by province extracted from NRCan’s National Energy Use Database (2014) and converted to diesel for medium and heavy trucks (all trucks gross weight > 3,856kg)
• Carbon price and CFS costs estimated per L diesel
• Fuel consumption X cost per L = total cost
Assumptions Made in Analysis

1) Government Policies

• In 2017 4 jurisdictions had carbon-pricing mechanisms
  – BC and AB = carbon tax
  – ON and QC = cap and trade

• Federal Government announced mandate for Pan-Canadian carbon-pricing
  – Minimum price of $10/tCO$_2$e in 2018, rising to $50/tCO$_2$e in 2022
  – Cap and trade schemes must show “equivalency” of outcomes, but will not be subject to the backstop
Assumptions Made in Analysis (cont’d)

2) Federal Clean Fuel Standard (CFS) will be similar to BC’s Low Carbon Fuel Standard
   • Will mandate a carbon intensity per unit of fossil fuels, reaching a 10% CI reduction by 2022
     – This is aggressive – recent work commissioned by Clean Energy Canada was based on a 5% CI reduction in 2020, 8% reduction in 2025 and 12.5% reduction in 2030
   • CFS credit price will be $171/tCO$_2$e and credit purchase will provide an indicative cost (i.e. alternate fuel production costs were not estimated)

3) Assumptions in following analysis:
   • In BC and AB, federal carbon price floor overlaid on existing levies
   • In ON and QC, carbon prices were back-calculated from allowance costs in the Western Climate Initiative (QC is currently a member, ON will join)
   • Federal price floor adopted for jurisdictions where there is a lack of clear carbon pricing information
     – Recent announcements by MB, BC and NS have not been included
Carbon Price Impact on Diesel Fuel Costs

(2017-2022)

Equivalent Carbon Price in 2017
(¢/L diesel)

Equivalent Carbon Price in 2022
(¢/L diesel)

*2022 levy rate 13.69¢/L in the federal carbon pricing backstop technical paper
Carbon Price Costs for Rail by Carrier Type

Class I Freight = 233M in 2022
CFS Impact on Diesel Fuel Costs (2017-2022)

3.09 ¢/L diesel

6.18 ¢/L diesel across all Canada
CFS Costs for Rail by Carrier type

Class I Freight = $134M in 2022
Carbon Price and CFS Impact on Diesel Fuel Costs (2017-2022)

Cumulative emissions policy costs in 2022 (¢/L diesel)
Carbon Price and LCFS Costs for Rail by Carrier type

Cumulative costs are on the order of $1.54B by 2022
## Rail and Truck Fuel Consumption
(1000 L)

<table>
<thead>
<tr>
<th>Province</th>
<th>Rail</th>
<th>Truck</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta</td>
<td>314,792</td>
<td>6,457,027</td>
</tr>
<tr>
<td>British Columbia</td>
<td>518,705</td>
<td>2,590,481</td>
</tr>
<tr>
<td>Manitoba</td>
<td>177,497</td>
<td>676,203</td>
</tr>
<tr>
<td>Newfoundland &amp; Labrador</td>
<td>16,118</td>
<td>290,740</td>
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<tr>
<td>New Brunswick</td>
<td>35,689</td>
<td>391,487</td>
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<tr>
<td>Nova Scotia</td>
<td>10,454</td>
<td>425,598</td>
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<tr>
<td>Ontario</td>
<td>631,065</td>
<td>5,858,502</td>
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<tr>
<td>Quebec</td>
<td>151,720</td>
<td>3,133,214</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>268,737</td>
<td>1,553,498</td>
</tr>
<tr>
<td>Northwest Territories</td>
<td>189</td>
<td></td>
</tr>
<tr>
<td>Yukon</td>
<td>171</td>
<td></td>
</tr>
<tr>
<td>Segments Terminating in the US*</td>
<td>10,860</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,135,997</td>
<td>21,376,750</td>
</tr>
</tbody>
</table>
Carbon Price Costs - Rail and Truck

![Graph showing the increase in carbon costs for rail and trucks over time, with rail costs starting at $0 in 2015 and increasing gradually, and freight truck costs starting higher in 2015 and increasing significantly by 2022.](Image)
Carbon Price and CFS Costs – Rail and Truck

<table>
<thead>
<tr>
<th>Year</th>
<th>Carbon Costs, $M CAD</th>
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</thead>
<tbody>
<tr>
<td>2015</td>
<td>Rail</td>
</tr>
<tr>
<td>2016</td>
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<tr>
<td>2017</td>
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<td>2020</td>
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</tr>
<tr>
<td>2021</td>
<td>Rail</td>
</tr>
<tr>
<td>2022</td>
<td>Rail</td>
</tr>
</tbody>
</table>

- **Truck**
- **Rail**
Questions?

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