

# New Brunswick Energy and Utilities Board

## Carbon Adjustor Six-month Period Review

Report date: December 8, 2023

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# 1. Executive summary

## 1.1 Project overview

This report was prepared by Grant Thornton (“we”, “us”, “our”, or “Grant Thornton”) under an engagement as a Consultant to the New Brunswick Energy and Utilities Board (the “NBEUB” or “the Board”) in connection to recent amendments to the *Petroleum Products Pricing Act* (“the Act” or “the PPPA”) and the *General Regulation – Petroleum Products Pricing Act*. Section 13.2 of the Act requires the Board to set a cost of carbon adjustor (“CCA”) at any time in which it considers appropriate, using criteria and procedures as determined by the Board. On June 13, 2023, the Board issued a decision to matter 549 in relation to the cost of carbon adjustor as an additional component in determining maximum petroleum product prices under the Act. In this decision, the Board established a formula and its inputs for setting the cost of carbon adjustor and stated that a review of the ongoing appropriateness of the various aspects of the formula was to be conducted no later than early in 2024.<sup>1</sup> This report is provided for the use of the Board in conducting the respective review of the various aspects of the formula currently implemented in the province of New Brunswick, based on current market conditions and the evolution of carbon credit trading systems in Canada.

## 1.2 Scope of work

Our report outlines the results of our work and documents our observations, findings, and recommendations. Specifically, our review included procedures undertaken in the consideration of the following matters:

- Review of the current formula for setting the carbon adjustor as well as our opinion on whether change is warranted due to changes in the carbon credit market or other factors;
- Review of the mechanism for the carbon adjustor related to Clean Fuel Regulations (“CFR”) in other jurisdictions and our opinion as to whether some aspects of the adjustor in other jurisdictions would be appropriate in New Brunswick; and,
- Review of the position of Environment and Climate Change Canada, as outlined in correspondence with the Board, and our opinion on if or how the formula should be amended to address the points raised.

## 1.3 Restrictions and limitations

This report was prepared for the NBEUB for the purpose of providing recommendations to the Board regarding the six-month period review of a cost of carbon adjustor for the province of New Brunswick. This report is not intended for general circulation or publication nor is it to be reproduced or used for any purpose other than that outlined herein without prior written permission in each specific instance. Notwithstanding the above, we understand that our report may be disclosed as a part of a public hearing process. We have given the Board consent to use our report for this purpose.

This report shall be used solely for the benefit of the Board and not for the benefit of any third-party and may be relied upon only for the purpose for which the report is intended as contemplated and/or defined within the engagement. Grant Thornton recognizes no responsibility whatsoever, other than that owed to the Board as at the date which the report is given to the Board by Grant Thornton, for any unauthorized use of or reliance on the report.

Our scope of work is as set out throughout this report. The procedures undertaken in the course of our review do not constitute an audit of financial information and consequently, we do not express an audit opinion on any financial information provided. Our opinions on other matters are outlined throughout this report.

Unless stated otherwise within the body of this report, Grant Thornton has referenced information provided by third-party sources in the preparation of this report. Where we have referenced third party information, we have included relevant footnotes throughout this report, a summary of which can be found in [Appendix A](#). At the time of this report, Grant Thornton believes this information to be reliable. We are not guarantors of the information

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<sup>1</sup> New Brunswick Energy and Utility Board – Matter No. 549 Decision – June 13, 2023 – [2023 06 13 - Decision - Matter 549.pdf \(nbeub.ca\)](#)

1 referenced. In preparing our report and, except as stated, we have not audited or otherwise attempted to verify  
2 any of the underlying information or data contained in the documents referenced.

3 All analysis, information, and recommendations contained herein are based upon the information made available  
4 to Grant Thornton as of the date of this report. We reserve the right, but will be under no obligation, to review  
5 and/or revise the contents of this report in light of any information which becomes known to us after the date of  
6 this report.

## 7 1.4 Summary of findings, observations, and conclusions

8 The following represents a summary of our key findings and recommendations based on the procedures outlined  
9 throughout the report:

#	Finding, observation, and conclusion
1.	It is generally expected by the industry that the Canadian carbon credit market will mature in 12 to 18 months. Once maturity is reached, it is expected that the adjustor formula would be revised to incorporate more Canadian based credit pricing assumptions. However, in the interim period, the Board should continue to review the interim CCA formula regularly to monitor for market changes that would suggest a change in the adjustor formula is required.
2.	The Board may wish to revise the interim CCA formula as outlined in <a href="#">Appendix C</a> to incorporate an adjustment which allows 10% of the CFR compliance to be achieved by contributing to the compliance fund at \$350 (adjusted annually for inflation). For periods in which the carbon credit price is greater than \$350, it is reasonable that primary suppliers would avail of this option as a cost savings measure. No further changes are recommended at this time.

## 2. Background

### 2.1 Clean Fuel Regulations in Canada

Clean Fuel Regulations (“CFR”) in Canada (published in July 2022) are a component of the overall climate initiative to reduce greenhouse gas emissions and accelerate the usage of clean fuels and technologies across the country.<sup>2</sup> CFR requires all suppliers (including producers and importers) of liquid fossil fuel to gradually reduce the amount of pollution emitted in the form of GHG emissions from the extraction, refining, distribution, and use of the fuels in Canada.<sup>3</sup> Over time, the benchmark established by the CFR is to achieve a reduction from levels in 2016 of approximately fifteen percent (15%) in the carbon intensity (“CI”) of gasoline and diesel consumed in Canada by the year 2030.<sup>4</sup> The CFR takes into account the GHG emissions connected to all stages of the lifecycle of fuel production and consumption, including extraction, processing, distribution, and end-usage. As of July 1, 2023, the carbon intensity reduction requirement for petroleum fuel suppliers started at 3.5 grams of carbon dioxide equivalent per megajoule of energy (“gCO<sub>2</sub>e/MJ”) and will subsequently increase by 1.5 gCO<sub>2</sub>e/MJ per calendar year until reaching a total of 14 gCO<sub>2</sub>e/MJ by 2030.<sup>5</sup> We understand that effective January 1, 2024, the carbon intensity reduction requirement for petroleum fuel suppliers will be 5.0 gCO<sub>2</sub>e/MJ.

### 2.2 New Brunswick Petroleum Pricing Act

On December 16, 2022, New Brunswick’s Bill 15 received Royal Assent and as such An Act Respecting Petroleum Pricing was revised to include a cost of carbon adjustor. The Act defines the cost of carbon adjustor as “...the result of a monetary adjustment intended to mitigate for wholesalers and retailers the effect of costs incurred during a given compliance period by a primary supplier of liquid petroleum products to comply with the Clean Fuel Regulations (Canada) or any other regulatory instrument made under the Canadian Environmental Protection Act, 1999 (Canada) and the Environmental Violations Administrative Monetary Penalties Act (Canada).”<sup>6</sup> Section 13.2 of the Act notes:

*“The Board shall set the cost of carbon adjustor and the market adjustor at any time the Board considers appropriate, using criteria and procedure as determined by the Board.”<sup>7</sup>*

Following the inclusion of a cost of carbon adjustor in the Act, the Board engaged Grant Thornton to propose the criteria and procedures that the Board may follow in setting the cost of carbon adjustor as expressed in Canadian cents per litre (“Initial Report”).<sup>8</sup> Subsequent to a public hearing pertaining to the matter (Matter No. 549) the Board released a decision stating:

*“The Board establishes the formula and its inputs attached as Appendix “A” as the initial mechanism for setting the cost of carbon adjustor component of maximum motor fuel prices calculated according to the PPPA and the General Regulation. No later than early 2024, the Board will conduct a review of the ongoing appropriateness of the various aspects of the formula, based on both current market conditions as well as the evolution of carbon credit trading systems in Canada.”<sup>9</sup>*

As included in **Appendix B**, we note that the current mechanism established by the Board is consistent with our recommendations provided in our report dated February 28, 2023.

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<sup>2</sup> Government of Canada – What are the Clean Fuel Regulations? – <https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/clean-fuel-regulations/about.html>. Accessed November 10, 2023

<sup>3</sup> Government of Canada – What are the Clean Fuel Regulations? – <https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/clean-fuel-regulations/about.html>. Accessed November 10, 2023.

<sup>4</sup> Government of Canada – What are the Clean Fuel Regulations? – <https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/clean-fuel-regulations/about.html>. Accessed November 10, 2023.

<sup>5</sup> Government of Canada – What are the Clean Fuel Regulations? – <https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/clean-fuel-regulations/about.html>. Accessed November 10, 2023.

<sup>6</sup> New Brunswick Energy and Utilities Board – Petroleum Products Pricing Act – Definitions - [P-8.05.pdf \(gnb.ca\)](#)

<sup>7</sup> New Brunswick Energy and Utilities Board – Petroleum Products Pricing Act – Section 13.2 - [P-8.05.pdf \(gnb.ca\)](#)

<sup>8</sup> Grant Thornton – New Brunswick Energy and Utilities Board - Review of the Cost of Carbon Adjustor – February 28, 2023 - [2023 02 28 - NBEUB - Cost of Carbon Adjustor \(pdf\).pdf](#)

<sup>9</sup> New Brunswick Energy and Utilities Board – Decision Matter 549 – June 13, 2023 - [2023 06 13 - Decision - Matter 549.pdf \(nbeub.ca\)](#)

## 3. Review of current formula

### 3.1 Current formula

We understand that due to the lack of a fully established carbon credit trading system at the time of the implementation of the cost of carbon adjustor (“CCA”), the Board decided to use the formula in our Initial Report proposed (the “Interim CCA Formula”). The Interim CCA Formula assumes that until the carbon credit market is established and there is liquidity within the market, the primary pathway to compliance with the CFR for primary suppliers in Atlantic Canada will rely heavily on Hydrogenation-Derived Renewable Diesel (“HDRD”).

The multi-step calculation to determine the Interim CCA Formula in cents per litre is as follows:

- Step 1 – determine the clean fuels regulation credit price
  - In the interim period, this is determined based on the difference between the price per liter of renewable diesel (“RD”) and the price per liter of low-sulfur diesel in Canadian Dollars.
- Step 2 – convert the incremental credit price per liter calculated in Step 1 to a credit price per tonne.
- Step 3 – apply the resulting CFR adjustor from Step 2 by fuel type i.e. 1) ultra-low sulfur diesel and 2) gasoline.

An illustrative calculation of the Interim CCA Formula as outlined in the decision pertaining to Matter No. 549 has been included in [Appendix B](#) of this report.<sup>10</sup>

## 4. Jurisdictional review

### 4.1 Petroleum pricing models in Atlantic Canada

The regulatory pricing frameworks for petroleum products across the Atlantic provinces are similar, with formulaic approaches being applied to compute weekly price adjustments.<sup>11</sup> As a function of the formulaic approaches employed, the average daily price is compared to a specified benchmark to adjust the maximum retail selling prices for petroleum fuels.

Maximum fuel prices are reflective of the components set out in each province’s respective legislation and includes benchmark prices, mark-ups, zone differentials, cost of carbon adjustors, and various forms of taxation (federal excise taxes, provincial taxes, carbon taxes/levies, and sales tax). Within Atlantic Canada, the provincial governments have granted authority over the regulation of maximum petroleum product pricing to the applicable provincial regulatory boards in each province.

The following table provides a summary of the petroleum pricing regulatory elements, as at the week ending November 11, 2023 for regular self-service gasoline. For purposes of comparison, the figures included below are illustrative of the maximums established for the lowest priced zone in each of the four Atlantic provinces (Saint John, NB; Halifax, NS; St. John’s, NL; and Charlottetown, PEI).

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<sup>10</sup> New Brunswick Energy and Utilities Board – Decision Matter 549 – June 13, 2023 – [2023 06 13 - Decision - Matter 549.pdf \(nbeub.ca\)](#)

<sup>11</sup> Newfoundland & Labrador Board of Commissioners of Public Utilities - 2022-2023 Petroleum Products Pricing Review - January 17, 2023.

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	New Brunswick <sup>12</sup>	Nova Scotia <sup>13</sup>	Newfoundland & Labrador <sup>14</sup>	Prince Edward Island <sup>15</sup>
Year in which regulation introduced	2006	2006	2001	1991
Adjustment timeframe	Weekly (Friday)	Weekly (Friday)	Weekly (Thursday)	Weekly (Friday)
Benchmark used	New York Harbor Spot / Discretion	New York Harbor Spot	New York Harbor Spot	Charlottetown Rack
Average benchmark price timeframe	5 days	5 days	7 days	Prior week
Extraordinary adjustments/criteria	Discretionary	(+/-) 6 to 8 cpl change in average benchmark price over two days (gas and diesel)	(+/-) 6 to 8 cpl change in daily or running average (all fuels)	Discretionary based upon daily assessment of prices and impact
Interrupter	✓	✓	✓	✓
Wholesale margin (cpl)	6.51	10.84	15.65	5.0
Retail margin (cpl)	8.46	5.7	10.28	8.0
Fixed minimum retail price	X	✓	X	✓
Transportation/zone differentials (cpl zone range)	Actual to maximum of 3.75	0.6 - 2.3	0.0 - 32.99	N/A
<b>OTHER COSTS</b>				
Carbon levy/tax (cpl)	14.31	14.31	14.31	14.31
Cost of carbon adjustor	3.86	3.74	3.74	N/A – costs are carried in Charlottetown rack price
Federal excise tax (cpl)	10.0	10.0	10.0	10.0
Provincial fuel taxes (cpl)	10.87	15.5	7.5	8.47
Harmonized sales tax (HST) %	15%	15%	15%	15%
<b>Maximum retail price (as at indicated date) \$ / L (November 11, 2023)</b>	<b>1.626</b>	<b>1.622</b>	<b>1.670</b>	<b>1.597</b>

1 The prescribed petroleum pricing components for each of the Atlantic provinces include elements which are  
2 common to each, and are described below as follows:

- 3 • **Benchmark** – The benchmark prices included within the maximum prices represent the cost of the  
4 product and are adjusted regularly to reflect the most recent product cost data as stipulated within the  
5 provincial petroleum pricing regulations. Benchmark prices are established by the regulator based upon  
6 the available commodity market data reported over the period since the last adjustment. The New York  
7 Harbour (“NYH”) spot price is used for each Atlantic province benchmark price except PEI. NBEUB has  
8 discretion to use another source and method of calculating benchmark prices. PEI uses the  
9 Charlottetown Rack as its benchmark.
- 10 • **Wholesale and Retail Margin** – The wholesale and retail margin or mark ups reflect the costs of  
11 supply. The margin is set by the regulator periodically from a public hearing and/or industry application.
- 12 • **Transportation / zone differential** – Pricing zones included in the maximum prices provide differential  
13 costs to be added reflective of the transportation costs required to the respective zones in each  
14 province. Newfoundland and Labrador has 26 pricing zones, Nova Scotia has 6, New Brunswick has  
15 one plus Parish of Grand Manan, and PEI has one pricing zone.

<sup>12</sup> New Brunswick Energy and Utility Board – Current Petroleum Prices - [New Brunswick Energy & Utilities Board - Current Petroleum Prices \(nbeub.ca\)](https://www.nbeub.ca). Accessed November 11, 2023.

<sup>13</sup> Nova Scotia Utility and Review Board – Gasoline and Diesel Prices - [Gasoline & Diesel Prices & Zone Map | Nova Scotia Utility and Review Board](https://www.nsuab.ca). Accessed November 11, 2023.

<sup>14</sup> Newfoundland and Labrador Board of Commissioners of Public Utilities – Weekly Maximum Pricing by Zone - [Wesley Hawe - Secondary.xlsxm \(pub.nf.ca\)](https://www.wesleyhawe.com). Accessed November 11, 2023.

<sup>15</sup> Prince Edward Island Regulatory and Appeals Commission – Current Petroleum Prices [Current Petroleum Prices \(irac.pe.ca\)](https://www.irac.pe.ca). Accessed November 11, 2023.

- 1 • **Carbon tax** – The federal government carbon tax was introduced in 2019. The carbon tax applies in  
2 provinces that have not adopted a carbon pricing model that meets the federal standard. This currently  
3 equals 14.31 cents per liter for gasoline and increases each year up to 2030.
- 4 • **Cost of carbon adjustment** – The cost of carbon adjustment (also known as the carbon charge and the  
5 carbon price adjustment) is an additional cost pertaining to the Clean Fuel Regulations that came into  
6 effect on July 1, 2023. Currently, New Brunswick, Nova Scotia, and Newfoundland and Labrador have  
7 adopted a cost of carbon adjustor to account for the costs of compliance of the Clean Fuel Regulations  
8 in their pricing models. We understand that because PEI uses the Charlottetown Rack benchmark, the  
9 cost of the clean fuel regulations incurred by refiners is reflected in their costs in the Rack price,  
10 ultimately flowing to consumers. The amount of the cost of carbon adjustment varies by province and is  
11 explained further in the following sections of this report.
- 12 • **Federal excise tax** – The federal excise tax is currently set at 10.0 cents per liter.
- 13 • **Provincial fuel tax** – Each province has a distinct provincial fuel tax.

## 14 4.2 Carbon adjustor mechanisms across Atlantic Canada

### 15 4.2.1 Nova Scotia

16 The Nova Scotia Utility and Review Board (“NSUARB”) recently underwent a Petroleum Products Wholesale  
17 Margin Review (M10853). While this matter covered margin topics beyond the adjustor, the NSUARB engaged  
18 Grant Thornton to prepare a report proposing the criteria and procedures the NSUARB may follow in setting the  
19 cost of carbon adjustor.<sup>16</sup> The Petroleum Products Pricing Regulations were amended on June 2, 2023.  
20 Amendments included the requirement that the fixed wholesale price for each petroleum product include a clean  
21 fuel adjustor amount to address the financial and administrative burdens associated with the application of the  
22 Clean Fuel Regulations or any other regulatory instrument made under the Canadian Environmental Protection  
23 Act, 1999 (Canada) and the Environmental Violations Administrative Monetary Penalties Act (Canada).<sup>17</sup>

24 On July 7, 2023, the NSUARB included a clean fuel adjustor in their weekly update for the setting of regulated  
25 petroleum products. The clean fuel adjustor amount is based on the maximum credit price of \$300 for transfers  
26 through the compliance credit clearing mechanism (“CCM”) under the Clean Fuel Regulations, and is set at 3.74  
27 cents per litre on gasoline and 4.17 cents per litre on diesel.<sup>18</sup> The CCM is a market-clearing mechanism that  
28 facilitates credit acquisition by primary suppliers who are unable to satisfy their reduction requirements following  
29 the end of a given compliance period. The CFR outlines an expectation that this \$300 would be adjected annually  
30 to reflect annual changes in the Consumer Price Index.<sup>19</sup>

### 31 4.2.2 Newfoundland and Labrador

32 On June 23, 2023, the Petroleum Products Regulations in Newfoundland and Labrador were amended to include  
33 a carbon price adjustment in maximum prices for motor and heating fuels. This amendment was associated with  
34 the federal Clean Fuel Regulations, which mitigates the costs incurred to wholesalers and retailers in relation to  
35 motor and heating fuels maximum prices.<sup>20</sup>

36 The Newfoundland and Labrador Board of Commissioners of Public Utilities (“P.U.B.”) has established the  
37 carbon price adjustment for motor fuels based on the maximum credit price of \$300 for transfers through the  
38 compliance credit clearing mechanism (“CCM”). Effective July 6, 2023, the P.U.B. has set the carbon adjustment  
39 at 3.74 cents per litre for gasoline motor fuel and 4.17 cents per litre for diesel motor fuel in all zones other than  
40 select zones in Labrador including zones 10,11, 11a,11b,12 and 14.<sup>21</sup> Such carbon adjustors are being made on  
41 an interim basis and P.U.B. is to review the implemented adjustments and whether there should be additional

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<sup>16</sup> Nova Scotia Utility and Review Board – Review of the Cost of Carbon Adjustor Mechanism – Grant Thornton

<sup>17</sup> Nova Scotia Utility and Review Board – M10853 (issued June 28, 2023)

<sup>18</sup> Nova Scotia Utility and Review Board – M10853 (issued June 28, 2023)

<sup>19</sup> Government of Canada – Clean Fuel Regulations: SOR/2022-140 - [canadagazette.gc.ca/rp-pr/p2/2022/2022-07-06/html/sor-dors140-eng.html](https://canadagazette.gc.ca/rp-pr/p2/2022/2022-07-06/html/sor-dors140-eng.html)

<sup>20</sup> Newfoundland and Labrador Board of Commissioners of Public Utilities Media Release (issued July 6, 2023) - [Microsoft Word - DRAFT Media Release for Price Adjustments July 6, 2023 \(pub.nf.ca\)](https://pub.nf.ca/Word-DRAFT-Media-Release-for-Price-Adjustments-July-6-2023)

<sup>21</sup> Newfoundland and Labrador Board of Commissioners of Public Utilities Order NO. P.P. 45 (2023) (issued July 5, 2023) - [NEWFOUNDLAND AND LABRADOR \(pub.nf.ca\)](https://pub.nf.ca/NEWFOUNDLAND-AND-LABRADOR)

1 adjustments. P.U.B. expects changes to be necessary as market conditions develop and more information  
2 becomes available in relation to Clean Fuel Regulations.<sup>22</sup>

### 3 4.2.3 Prince Edward Island

4 On June 15, 2023, Prince Edward Island Regulatory and Appeals Commission (“IRAC” or the “Commission”),  
5 announced that the Commission would review the pricing model for petroleum products, including for gasoline,  
6 diesel, furnace oil and commercial diesel sold in PEI. The scope of the review of order PMC22-01 - Commission  
7 Petroleum Margin Review, includes the appropriate benchmark price used to make weekly price adjustments, the  
8 wholesale and retail margins for petroleum products, and incorporating carbon costs associated with the Clean  
9 Fuel Regulations into the pricing model.<sup>23</sup>

10 IRAC engaged Gardner Pinfold Consultants Inc (“Gardner”) to assist with the review. In their report, dated May  
11 2023, Gardner recommends the following:

12 *“Recommendation 1: Continue to use the Charlottetown rack price as the benchmark for making weekly*  
13 *price adjustments. Continue to monitor NYH and rack prices in regional markets to identify any shifts in*  
14 *the Charlottetown rack relative to others and to obtain from refiners a satisfactory explanation for such*  
15 *shifts.”<sup>24</sup>*

16 Further, the supplemental report provided by Gardner, illustrates their recommended pricing formula using NYH  
17 as the benchmark price, should IRAC choose to replace the existing Charlottetown rack price. In the  
18 supplemental report, Gardner explains that when using the NYH benchmark, the regulator would set the adjustor  
19 based on industry costs or, in the absence of industry data, by a proxy.<sup>25</sup> Gardner also notes that through the  
20 continued use of the Charlottetown rack price as the benchmark, the clean fuel adjustor will be flown through the  
21 formula to consumers as refiners reflect their costs in the rack price.<sup>26</sup>

22 On October 13, 2023, IRAC announced a public hearing would be held with respect to the review of the pricing  
23 model and margins for petroleum products including Clean Fuel Regulations.<sup>27</sup> The hearing regarding PMC22-01  
24 (Commission Petroleum Margin Review) was held on November 6, 2023. At the date of our report, the decision  
25 regarding the matter has not been made publicly available.

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<sup>22</sup> Newfoundland and Labrador Board of Commissioners of Public Utilities Order NO. P.P. 45 (2023) (issued July 5, 2023) - [NEWFOUNDLAND AND LABRADOR \(pub.nf.ca\)](https://pub.nf.ca)

<sup>23</sup> Prince Edward Island Regulatory and Appeals Commission – Review of the Pricing Model and Margins for Petroleum Products including the Clean Fuel Regulations – June 15, 2023 - [Public-Notice-Petroleum-Margin-Review-June-15-2023.Final\\_.pdf \(irac.pe.ca\)](https://www.ircac.ca/~/media/Files/2023/06/15/2023.Final_.pdf)

<sup>24</sup> Gardner Pinfold Consultants Inc. – Petroleum Products Benchmark and Margin Review – May 2023 - [Exhibit-C-1a-PEI-margin-review-report-2023-final.pdf \(irac.pe.ca\)](https://www.ircac.ca/~/media/Files/2023/05/2023.Exhibit-C-1a-PEI-margin-review-report-2023-final.pdf)

<sup>25</sup> Gardner Pinfold Consultants Inc. – Petroleum Products Benchmark and Margin Review – Pricing formula using NYH as the benchmark price – July 2023 - [Exhibit-C-5-The-pricing-formula-using-NYH-August-2-2023.pdf \(irac.pe.ca\)](https://www.ircac.ca/~/media/Files/2023/07/2023.Exhibit-C-5-The-pricing-formula-using-NYH-August-2-2023.pdf)

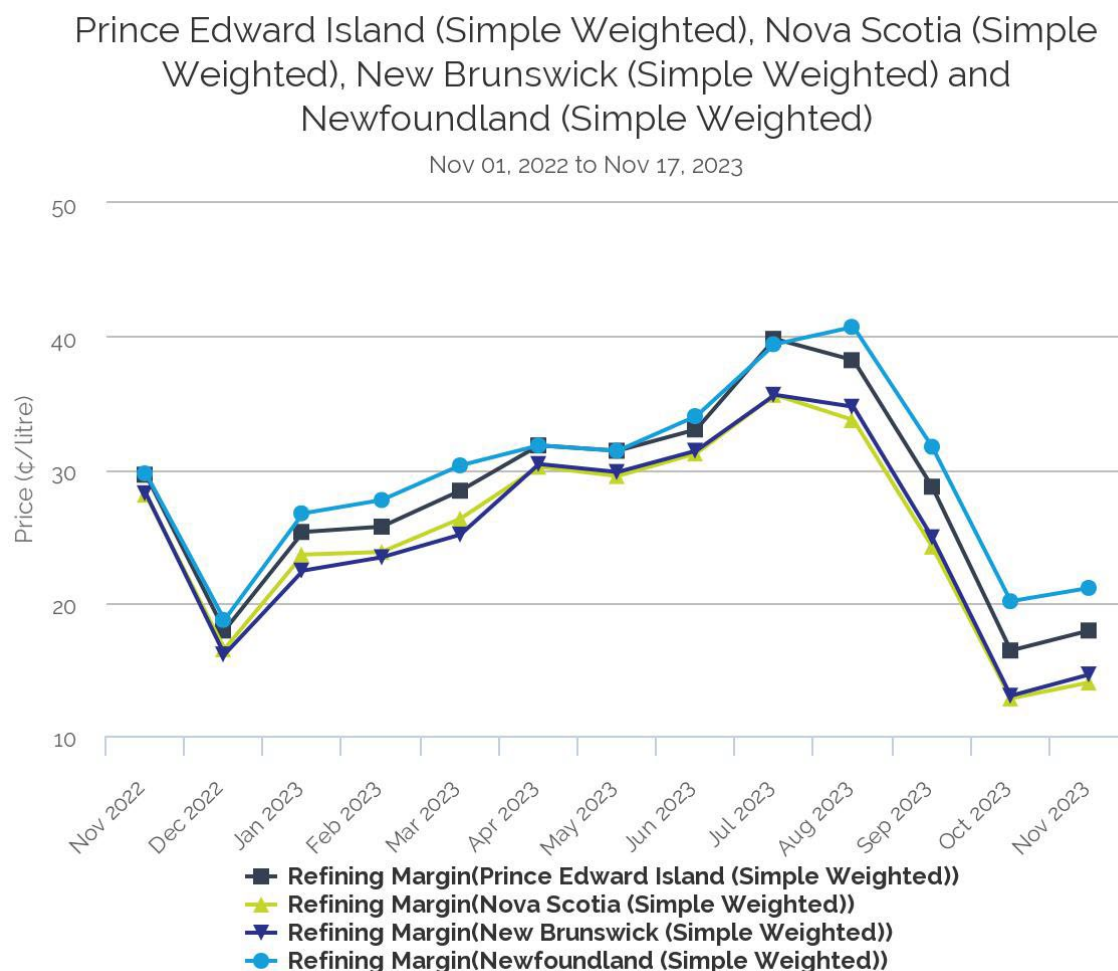
<sup>26</sup> Gardner Pinfold Consultants Inc. – Petroleum Products Benchmark and Margin Review – Pricing formula using NYH as the benchmark price – July 2023 - [Exhibit-C-5-The-pricing-formula-using-NYH-August-2-2023.pdf \(irac.pe.ca\)](https://www.ircac.ca/~/media/Files/2023/07/2023.Exhibit-C-5-The-pricing-formula-using-NYH-August-2-2023.pdf)

<sup>27</sup> Prince Edward Island Regulatory and Appeals Commission – Notice of Hearing – October 13, 2023 [Public-Notice-Petroleum-Hearing.pdf \(irac.pe.ca\)](https://www.ircac.ca/~/media/Files/2023/10/2023.Public-Notice-Petroleum-Hearing.pdf)

## 4.3 Refining margins

Kalibrate<sup>28</sup> publicly reports refining margins by province. Based on this information, we have identified the refining margins pertaining to unleaded gasoline from November 1, 2022 to November 17, 2023. The figure below identifies the provincial data for New Brunswick, Nova Scotia, Newfoundland and Labrador, and Prince Edward Island.

**Figure 1: Monthly refining margins in Atlantic provinces<sup>29</sup>**



The above figure indicates that refining margins have fluctuated in all Atlantic provinces in the past year. Furthermore, it is important to highlight that the Atlantic provinces experienced higher refining margins in the months preceding the implementation of the CFR and respective cost of carbon adjustors in pricing models. It is also apparent that the refining margins have since returned to lower levels more consistent with prior months. Ultimately, the data provided by Kalibrate suggests that refiners have not experienced long-term margin increases due to the cost of carbon adjustors in New Brunswick, Nova Scotia, or Newfoundland and Labrador.

## 4.4 CFR across Canada

Previously in this report, we outlined the CFR compliance costs as adopted by the respective regulatory bodies in each Atlantic Province. However, the Board may wish to consider what is happening in other Canadian jurisdictions. While those jurisdictions are not directly comparable given that petroleum pricing is largely unregulated elsewhere in Canada, contextual information will better support the understanding of those differences and the communication of a Board decision to the public. In the absence of price regulation, the

<sup>28</sup>Kalibrate - [Kalibrate](#) – Accessed November 17, 2023

<sup>29</sup>Kalibrate - [Kalibrate](#) – Accessed November 17, 2023

1 compliance costs associated with CFR would reasonably be expected to be reflected in the rack prices of the  
2 product. As a result, the Board may wish to consider the degree at which rack prices varied in jurisdictions  
3 outside of Atlantic Canada. It is important to note that some jurisdictions had clean fuel initiatives in effect prior to  
4 the introduction of CFR. As such, it is expected that rack prices for petroleum products in these jurisdictions  
5 would have already included compliance costs prior to July 1, 2023. For illustrative purposes, the low carbon fuel  
6 policies adopted in other provinces prior to CFR are detailed in the below table:

Province	Low carbon fuel policy
<b>British Columbia</b>	The Renewable and Low Carbon Fuel Requirement Regulation has placed clean fuel standards on primary suppliers in this province. Currently, this requires ethanol content in gasoline and diesel fuel of 5% and 4%, respectively. The province also has a Low Carbon Fuel Standard which aims to achieve a 20% reduction in fuel carbon intensity by 2030. <sup>30</sup>
<b>Alberta</b>	The Renewable Fuels Standard has required a minimum annual average of 5% renewable alcohol in gasoline and 2% renewable diesel in diesel fuel sold in Alberta by fuel suppliers. To meet the Renewable Fuels Standard, renewable fuels must demonstrate at least 25% fewer GHG emissions than the equivalent petroleum fuel. <sup>31</sup>
<b>Manitoba</b>	Manitoba's Ethanol Mandate requires fuel suppliers in Manitoba to blend at least 10% of ethanol in their gasoline. The Biodiesel Mandate requires fuel suppliers to blend 5% renewable content in on- and off-road diesel fuel. <sup>32</sup>
<b>Ontario</b>	The Cleaner Transportation Fuels regulation requires that fuel suppliers blend 10% of renewable content in gasoline from 2020 to 2024. The renewable content requirement increases to 11% in 2025, 13% in 2028, and 15% in 2030. The renewable content must emit fewer greenhouse gas emissions than fossil gasoline on a lifecycle basis by 45% before 2030 and 50% from 2030. The regulation also requires fuel suppliers to continue to blend 4% renewable content in diesel. This renewable content must emit 70% fewer greenhouse gas emissions than fossil diesel on a lifecycle basis. <sup>33</sup>
<b>Saskatchewan</b>	The Renewable Diesel Act in Saskatchewan requires fuel distributors to include 2% renewable diesel content. The province also has a 7.5% ethanol mandate. <sup>34</sup>
<b>Quebec</b>	Effective January 1, 2023, gasoline and diesel fuels distributed in Québec will incorporate clean fuels. Quebec requires 10% low-carbon fuel content in gasoline in 2023 with increases to 15% by 2030. Low-carbon fuel content in diesel has begun at 3% in 2023 and increase to 10% by 2030. In both fuel pools, the low-carbon content volume requirements will be adjusted by a carbon intensity factor. <sup>35</sup>

7 Given that the above noted provinces already had clean fuel initiatives in place in some form, we would have  
8 expected much of the compliance cost requirements to have impacted these jurisdictions prior to July 1, 2023. In  
9 contrast, the Atlantic Canadian provinces did not have specific provincial clean fuel regulations prior to CFR. As a  
10 result, Atlantic Canadians experienced the increase in compliance costs when the CFR came into effect on July  
11 1, 2023.

## 12 5. Correspondence from ECCC

13 On May 26, 2023, Environment and Climate Change Canada ("ECCC") provided an analysis to Atlantic Canadian  
14 regulators (the "ECCC Analysis")<sup>36</sup> commenting on the assumptions and methodologies used in our Review of  
15 the Cost of Carbon Adjustor Mechanism reports prepared by Grant Thornton.<sup>37</sup> We have reviewed these

<sup>30</sup> Government of Canada – What are the Clean Fuel Regulations? - [What are the Clean Fuel Regulations? - Canada.ca](#)

<sup>31</sup> Government of Canada – What are the Clean Fuel Regulations? - [What are the Clean Fuel Regulations? - Canada.ca](#)

<sup>32</sup> Government of Canada – What are the Clean Fuel Regulations? - [What are the Clean Fuel Regulations? - Canada.ca](#)

<sup>33</sup> Government of Canada – What are the Clean Fuel Regulations? - [What are the Clean Fuel Regulations? - Canada.ca](#)

<sup>34</sup> Government of Canada – What are the Clean Fuel Regulations? - [What are the Clean Fuel Regulations? - Canada.ca](#)

<sup>35</sup> Government of Canada – What are the Clean Fuel Regulations? - [What are the Clean Fuel Regulations? - Canada.ca](#)

<sup>36</sup> Environment and Climate Change Canada – Analysis of Third-Party Analyses: Cost of compliance with the Clean Fuel Regulations in Atlantic Provinces using only Renewable Diesel (May 26, 2023)

<sup>37</sup> New Brunswick Energy and Utilities Board - Review of the Cost of Carbon Adjustor (dated February 28, 2023) - 2023 02 28 - NBEUB - Cost of Carbon Adjustor (pdf).pdf

1 comments and consulted with ECCC on June 1, 2023, to obtain an understanding of the matters addressed in  
2 the ECCC Analysis.

3 Specifically, the ECCC Analysis notes:

4 “Enough credits are expected to be available in 2023 (13.4Mt in Canada) to allow for compliance with  
5 the reduction requirements (4.7Mt in Canada). Annual reduction requirements in Atlantic Canada in  
6 2023 represent 2.7% of the credits expected to be created and banked in 2022 and 2023.”<sup>38</sup>

7 While we understand ECCC’s comments of the availability of credits, there is currently limited publicly available  
8 information for the Board to rely upon in future weekly fuel price update calculations. Additionally, we understand  
9 that the ECCC’s Clean Fuel Regulations Credit and Tracking System (“CATS”) does provide data pertaining to  
10 credit availability, however, the industry has generally indicated that the Canadian market has not yet reached a  
11 state of liquidity. As such, we have not contemplated this approach in our proposed revised CCA Formula. When  
12 the credit market in Canada becomes more mature in approximately 12-18 months, the Board could decide to  
13 adjust the inputs into the proposed formula.

14 The ECCC also noted the compliance flexibilities available to regulated parties:

15 “Satisfy up to 10% of compliance obligation for the 2023 compliance period by contributing to the  
16 compliance fund set in the CFR at \$350 x (Consumer Price Index 2023/ Consumer Price Index 2022)  
17 per tonne – which is lower than the two analyses estimate based on the purchase of renewable  
18 diesel.”<sup>39</sup>

19 For illustrative purposes, should the Board wish to incorporate the compliance fund into the calculation, we have  
20 reflected the 10% compliance fund contribution in the revised CCA Formula outlined in [Appendix C](#). Given that  
21 the compliance costs to suppliers is less than the calculated cost to import renewable diesel as a proxy for  
22 compliance costs, it is reasonable to assume that where possible, primary suppliers will utilize the 10%  
23 compliance fund.

24 The ECCC also notes the following compliance flexibility:

25 “Defer 10% of their obligation in 2023 to 2024, until such time they can create credits or more credits are  
26 available on the market.”<sup>40</sup>

27 We understand that including the deferral option in the cost of carbon adjustor could mitigate the increases as a  
28 result of the CFR. However, regulatory practice typically matches cost recovery to the period in which the cost  
29 was incurred. As such, the revised mechanism does not incorporate an adjustment for a short-term compliance  
30 deferral.

31 With regards to the selection of carbon intensity values, ECCC recommended the following:

32 “For California, the CI values seemed to have been based on approved CI values for renewable diesel  
33 from soybean oil. The average of the approved CI values for renewable diesel produced from soybean  
34 oil and canola oil may be used (56.9gCo2e/MJ).”<sup>41</sup>

35 The Initial CCA Formula includes soybean-based feedstock. This input into the CCA Formula relies upon the  
36 LCFS Pathway Certified Carbon Intensities published by the California Air Resources Board.<sup>31</sup> At the time of our  
37 initial analysis, the referenced tables did include two data points pertaining to the energy density of renewable  
38 diesel produced with canola oil feedstock. We have found no reason why the Board should exclude canola oil  
39 from the analysis. However, given that at the time of our review, there were only two data points noted in the  
40 table and both of those data elements pertained to the same fuel producer, the Board is encouraged to closely  
41 monitor the availability of data pertaining to canola oil feedstock should the adjustor mechanism include this data.  
42 As of the date of this report, including canola oil in the analysis does not significantly change the outcome of the  
43 calculation. We have adjusted the illustrative CCA Formula to reflect average current certified CI of renewable

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<sup>38</sup> Environment and Climate Change Canada – Analysis of Third-Party Analyses: Cost of compliance with the Clean Fuel Regulations in Atlantic Provinces using only Renewable Diesel (May 26, 2023)

<sup>39</sup> Environment and Climate Change Canada – Analysis of Third-Party Analyses: Cost of compliance with the Clean Fuel Regulations in Atlantic Provinces using only Renewable Diesel (May 26, 2023)

<sup>40</sup> Environment and Climate Change Canada – Analysis of Third-Party Analyses: Cost of compliance with the Clean Fuel Regulations in Atlantic Provinces using only Renewable Diesel (May 26, 2023)

<sup>41</sup> Environment and Climate Change Canada – Analysis of Third-Party Analyses: Cost of compliance with the Clean Fuel Regulations in Atlantic Provinces using only Renewable Diesel (May 26, 2023)

1 diesel from both soybean oil and canola oil based on the current fuel pathway data provided by the California Air  
2 Resources Board as of November 17, 2023. However, given the small population size for carbon intensity data  
3 on the canola oil feedstock sourced product, the Board should monitor the information for potential outliers that  
4 would incorporate enhanced volatility into the calculation.

5 With regards to the CFR default carbon intensity, ECCC recommended the following:

6 “For the CFR, a default CI value of 35 gCO<sub>2</sub>e/MJ was used. The CI will be calculated from the Fuel LCA  
7 Model based on facility-specific data. CI values determined using ECCC’s Fuel LCA Model are  
8 anticipated to be lower than default CI values. Approved CI values under BC LCFS for HDRD may be  
9 used to estimate the CI values of renewable diesel under the CFR at this time. As feedstock types are  
10 not indicated, ECCC suggests using the average of the approved CI values greater than 25 (that are  
11 likely representative of HDRD produced from soybean oil and canola oil) (29.7 gCO<sub>2</sub>e/MJ).”<sup>42</sup>

12 ECCC has proposed a methodology for determining the carbon intensity of renewable diesel. We reviewed these  
13 alternatives and can offer the following comments:

- 14 • The ECCC Fuel LCA Model is a publicly available tool to calculate the life cycle carbon intensity (CI) of  
15 fuels and energy sources used and produced in Canada. As such, we would agree this is a suitable  
16 source for the carbon intensity input for the CCA Formula.
- 17 • Approved CI values under BC LCFS for HDRD were also reviewed. Given that the feedstock is not  
18 reported on these reports, we are unable to conclude on whether excluding CI values greater than 25  
19 focuses the data on products derived from canola oil and soybean oil feedstock.

## 20 6. Other considerations

### 21 6.1 Transportation costs

22 During the public hearing associated with Matter 549 some stakeholders noted that the interim CCA formula  
23 should include an adjustment for the transportation costs of getting HDRD to the Atlantic provinces. These  
24 stakeholders noted that the majority of their renewable diesel would be imported from the U.S. and as such the  
25 adjustor mechanism should include some consideration of the associated transportation costs. Following the New  
26 Brunswick hearing, we were engaged to continue our work on the interim CCA formula in Nova Scotia as well as  
27 Newfoundland and Labrador. During these additional stakeholder consultations, we specifically addressed the  
28 topic of transportation with industry stakeholders. Based upon these additional consultations and our further  
29 review of this matter, we have concluded that the addition of transportation costs to the interim CCA formula is  
30 not required at this time. In general, stakeholders did not express serious concern with the Interim CCA formula  
31 in its current form. It is generally understood that the Interim CCA formula is an interim solution meant to support  
32 cost recovery of potential CRF compliance costs in the region and is not meant to reflect real costs to individual  
33 suppliers as there are a variety of compliance pathways that may be considered on a participant by participant  
34 basis. Furthermore, it’s unclear what transportation costs may be embedded in other assumptions within the  
35 model. For example, it is likely that the California LCFS credits price plus D4 RINS value includes some  
36 consideration for the transportation costs associated with bringing the product to the California market. If the  
37 Board should decide to add transportation costs to the Interim CCA formula, there should be an offsetting  
38 reduction for the implied transportation costs in other assumptions within the formula.

39 It is expected that the Canadian credit market will mature in 12 to 18 months. As such, we are of the opinion that  
40 the additional time and complexity introduced by exploring all potential compliance scenarios outweigh its  
41 benefits. Should the market fail to reach maturity in the expected 12-to-18-month time period, we would  
42 recommend that the Board consider further additions to the interim CCA formula. However, consistency and  
43 understandability of the formula in the interim period is of the utmost importance.

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<sup>42</sup> Environment and Climate Change Canada – Analysis of Third-Party Analyses: Cost of compliance with the Clean Fuel Regulations in Atlantic Provinces using only Renewable Diesel (May 26, 2023)

## 7. Amendment of formula

In our Initial Report, we suggested that the Board may consider revising Step 1 of the Interim CCA Formula, once the carbon credit trading system was established and reached a state of market liquidity. Our suggested revision to Step 1 (with Step 2 and 4 remaining unchanged) was as follows:

- Step 1 – determine the Canadian clean fuels regulation credit price

We understand that ECCC has released a Clean Fuel Regulations Credit and Tracking System for primary suppliers and registered creators. ECCC's CATS is a web platform developed to enable registration, reporting, credit creations, and credit transactions for both primary suppliers and registered creators.<sup>43</sup> It is our understanding that CATS is a new platform that has not yet reached a state of liquidity and the data pertaining to the volume of existing credits in the market available for trading has not yet matured. During stakeholder consultations completed during the preparation of our Initial Report, industry participants generally agreed that in a period of 18-24 months there may be greater certainty pertaining to the availability of information to better reflect market conditions in Atlantic Canada. As such, we do not recommend the Board apply the above revision to Step 1 at this time, and instead reconsider this revision in future reviews of the adjustor.

Based on our review of the feedback provided by ECCC<sup>44</sup>, we recommend that the Board consider incorporating the credit price per tonne for the compliance fund to account for the 10% compliance that may be satisfied through this channel. Steps 1 through 3 will remain the same, however, 90% of the amounts calculated in Step 3 will be applied towards the reduction requirements. Three additional steps will be required, as outlined below.

- Step 1- determine the clean fuel regulation credit price
- Step 2 – convert the credit price per liter calculated in Step 1 to a credit price per tonne
- Step 3 – apply the CFR adjustor from Step 2 by fuel type (i.e. 1) ultra-low sulfur diesel and 2) gasoline).
- Step 4 – calculate credit price per tonne for compliance fund
  - As outlined in the CFR, the number of compliance credits a primary supplier can create for a compliance period is determined by the following formula:<sup>45</sup>

$$C=P$$

where,

C is the amount of the primary supplier's contribution to the registered emission-reduction funding program; and,

P is \$350

- Additionally, the CFR outlines that on every January 1<sup>st</sup> that follows the end of a compliance period, the amount defined as P may be replaced by the following formula.<sup>46</sup>

$$\$350 \times (CPI_A \div CPI_B)$$

where,

CPI<sub>A</sub> is the average consumer price index for the calendar year to which the compliance period related, as published by Statistics Canada; and,

CPI<sub>B</sub> is the average CPI for the 12 months of the year 2022, as published by Statistics Canada.

- Step 5 – apply the CFR adjustor from Step 4 by fuel type i.e.) ultra-low sulfur diesel and 2) gasoline
- Step 6 – combined cost of carbon adjustor
  - In this step, the combined cost of carbon adjustor is calculated by the following:

<sup>43</sup> Environment and Climate Change Canada – Clean Fuel Regulations Credit and Tracking System User Guide - [CFR PS RC FS User Guide - May 2022 \(canada.ca\)](#) – Accessed November 10, 2023

<sup>44</sup> Environment and Climate Change Canada – Analysis of Third-Party Analyses: Cost of compliance with the Clean Fuel Regulations in Atlantic Provinces using only Renewable Diesel (May 26, 2023)

<sup>45</sup> Environment and Climate Change Canada – Clean Fuel Regulations SOR/2022-140 - [SOR-2022-140.pdf \(justice.gc.ca\)](#)

<sup>46</sup> Environment and Climate Change Canada – Clean Fuel Regulations SOR/2022-140 - [SOR-2022-140.pdf \(justice.gc.ca\)](#)



# 1 Appendix A – Documents referenced

2 The following table provides a summary of the external documents referenced during our review.

#	Source
1	Environment and Climate Change Canada – Analysis of Third-Party Analyses: Cost of compliance with the Clean Fuel Regulations in Atlantic Provinces using only Renewable Diesel (May 26, 2023)
2	Environment and Climate Change Canada – Clean Fuel Regulations SOR/2022-140 - <a href="#">SOR-2022-140.pdf (justice.gc.ca)</a>
3	Environment and Climate Change Canada – Clean Fuel Regulations Credit and Tracking System User Guide - <a href="#">CFR PS RC FS User Guide - May 2022 (canada.ca)</a> – Accessed November 10, 2023
4	Gardner Pinfold Consultants Inc. – Petroleum Products Benchmark and Margin Review – May 2023 - <a href="#">Exhibit-C-1a-PEI-margin-review-report-2023-final.pdf (irac.pe.ca)</a>
5	Gardner Pinfold Consultants Inc. – Petroleum Products Benchmark and Margin Review – Pricing formula using NYH as the benchmark price – July 2023 - <a href="#">Exhibite-C-5-The-pricing-formula-using-NYH-August-2-2023.pdf (irac.pe.ca)</a>
6	Government of Canada – Clean Fuel Regulations: SOR/2022-140 - <a href="#">canadagazette.gc.ca/rp-pr/p2/2022/2022-07-06/html/sor-dors140-eng.html</a>
7	Government of Canada – What are the Clean Fuel Regulations? - <a href="#">What are the Clean Fuel Regulations? - Canada.ca</a>
8	Kalibrate - <a href="#">Kalibrate</a> – Accessed November 17, 2023
9	New Brunswick Energy and Utility Board – Current Petroleum Prices - <a href="#">New Brunswick Energy &amp; Utilities Board - Current Petroleum Prices (nbeub.ca)</a>
10	New Brunswick Energy and Utility Board – Decision Matter 549 – June 13, 2023 - <a href="#">2023 06 13 - Decision - Matter 549.pdf (nbeub.ca)</a>
11	New Brunswick Energy and Utilities Board – Petroleum Products Pricing Act – Section 13.2 - <a href="#">P-8.05.pdf (gnb.ca)</a>
12	New Brunswick Energy and Utilities Board - Review of the Cost of Carbon Adjustor (dated February 28, 2023) - 2023 02 28 - NBEUB - Cost of Carbon Adjustor (pdf).pdf
13	Newfoundland and Labrador Board of Commissioners of Public Utilities Media Release – July 6, 2023 - <a href="#">Microsoft Word - DRAFT Media Release for Price Adjustments July 6, 2023 (pub.nf.ca)</a>
14	Newfoundland and Labrador Board of Commissioners of Public Utilities Order NO. P.P. 45 (2023) (issued July 5, 2023) - <a href="#">NEWFOUNDLAND AND LABRADOR (pub.nf.ca)</a>
15	Newfoundland and Labrador Board of Commissioners of Public Utilities – Weekly Maximum Pricing by Zone - <a href="#">Wesley Hawe - Secondary.xlsm (pub.nf.ca)</a>
16	Newfoundland and Labrador Board of Commissioners of Public Utilities - 2022-2023 Petroleum Products Pricing Review - January 17, 2023.
17	Nova Scotia Utility and Review Board – Gasoline and Diesel Prices - <a href="#">Gasoline &amp; Diesel Prices &amp; Zone Map   Nova Scotia Utility and Review Board</a>
18	Nova Scotia Utility and Review Board – M10853 – June 28, 2023
19	Nova Scotia Utility and Review Board – Review of the Cost of Carbon Adjustor Mechanism – Grant Thornton
20	Prince Edward Island Regulatory and Appeals Commission – Current Petroleum Prices <a href="#">Current Petroleum Prices (irac.pe.ca)</a>
21	Prince Edward Island Regulatory and Appeals Commission – Notice of Hearing – October 13, 2023 <a href="#">Public-Notice-Petroleum-Hearing.pdf (irac.pe.ca)</a>
22	Prince Edward Island Regulatory and Appeals Commission – Review of the Pricing Model and Margins for Petroleum Products including the Clean Fuel Regulations – June 15, 2023 - <a href="#">Public-Notice-Petroleum-Margin-Review-June-15-2023.Final .pdf (irac.pe.ca)</a>

## Appendix B – Current cost of carbon adjustor in New Brunswick

The following formula details the initial mechanism for setting the cost of carbon adjustor as outlined by the Board in their decision regarding Matter 549.

Matter 459 - Appendix A (Cost of Carbon Adjustor Calculations)					
<b>Step 1 Determine the clean fuels regulation credit price</b>					
	<b>Units</b>	<b>Reference</b>	<b>Inputs</b>		<b>Source</b>
California LCFS credit	USD / tonne	A	TBD		Note 1
California low carbon fuels intensity target	gCO <sub>2</sub> e/MJ	B	TBD		Note 2
California renewable diesel carbon intensity	gCO <sub>2</sub> e/MJ	C	TBD		Note 3
Difference	gCO <sub>2</sub> e/MJ	<b>D = B - C</b>			
California renewable diesel energy density	MJ / litre	E	34.25		Note 4
Conversion factor		F	1,000,000		Note 5
Exchange Rate (weekly)		G	TBD		Note 6
<b>Low carbon fuels standard credit price</b>	SCDN / litre	<b>H = A*D*E/F*G</b>			
D4 RIN Value	USD / US gallon	I	TBD		Note 7
Renewable diesel RIN equivalence value	USD / US gallon	J	1.7		Note 8
Exchange Rate (weekly)		G	TBD		Note 6
Conversion US gallon to litres		K	3.78541		
<b>D4 RIN Price</b>	SCDN / litre	<b>L = I*J*G/K</b>			
<b>Interim clean fuel credit price</b>	SCDN / litre	<b>M = H + L</b>			
<b>Step 2 Convert the credit price per litre calculated in Step 1 to a credit price per tonne</b>					
	<b>Units</b>	<b>Reference</b>	<b>Inputs</b>		
Clean Fuels Regulation liquid class reference carbon intensity	gCO <sub>2</sub> e/MJ	N	TBD		Note 9
Clean Fuels Regulation renewable diesel default carbon intensity	gCO <sub>2</sub> e/MJ	O	35		Note 10
<b>Incremental carbon intensity</b>	gCO <sub>2</sub> e/MJ	<b>P = N - O</b>			
Clean Fuels Regulation renewable diesel energy density	MJ / litre	Q	34.921		Note 11
Conversion factor		F	1,000,000		Note 12
<b>CFR credit price per tonne</b>	SCDN / tonne	<b>R = M/P/Q*F</b>			
<b>Step 3 Apply the CFR adjustor from Step 2 by fuel type (ULSD &amp; gasoline)</b>					
	<b>Units</b>	<b>Reference</b>	<b>Gasoline</b>	<b>ULSD</b>	
Clean fuels regulations default (baseline) carbon intensity	gCO <sub>2</sub> e/MJ	S	95.00	93.00	Note 13
Clean fuels regulations target	gCO <sub>2</sub> e/MJ	T	TBD	TBD	Note 14
Incremental	gCO <sub>2</sub> e/MJ	<b>U=S-T</b>	3.5	3.5	
Clean fuels regulation energy density	MJ / litre	V	34.69	38.65	Note 15
Conversion factor		F	1,000,000	1,000,000	Note 5
<b>Proposed Cost of Carbon Adjustor</b>	SCDN / litre	<b>W = R*U*V/F</b>			

### Notes

1	California Air Resources Board: Weekly LCFS Credit Transfer Activity Report, Average Price (All Non Zero Transfers) (weekly)
2	California Low Carbon Fuel Standard Regulation: Table 2. LCFS Carbon Intensity Benchmarks for 2011 to 2030 for Diesel Fuel and Fuels Used as a Substitute for Diesel Fuel (current year)
3	California Air Resources Board: LCFS Pathway Certified Carbon Intensities, Soybean and Soybean Oil Feedstock for Renewable Diesel (RND) (weekly)
4	Argus Air Daily: Methodology and Specifications Guide, Energy density of renewable diesel (129.65 MJ/gal / 3.7854 = 34.25 MJ/litre) (fixed)
5	Convert tonnes to gCO <sub>2</sub> e/MJ - divide by 1 million
6	Weekly USD/SCDN exchange rate (Bank of Canada), corresponding to weekly LCFS Credit Transfer Price (weekly)
7	Weekly average biomass-based diesel (D4) RIN price (current year), Source: Argus Americas Biofuels, corresponding to weekly LCFS Credit Transfer Price (weekly)
8	US Code of Federal Regulations, Equivalence values for renewable fuel, §80.1415(b)(4) (fixed)
9	Clean Fuel Regulations, Schedule 1, Reference Carbon intensity, Liquid class (current year)
10	Clean Fuel Regulations, Section 170(1), liquid class default carbon intensity (fixed)
11	Clean Fuel Regulations, Schedule 2, Energy Density of Fuels (Item 10 – Hydrogenation-derived renewable diesel) (fixed)
12	Convert gCO <sub>2</sub> e/MJ to tonnes - multiply by 1 million
13	Clean Fuel Regulations, Section 5(3), Baseline Carbon-Intensity (fixed)
14	Clean Fuel Regulations, Section 5(1), Fuel Carbon-Intensity Limits (current year)
15	Clean Fuel Regulations, Schedule 2, Energy Density of Fuels (Item 9 – Gasoline and Item 13 - Diesel) (fixed)

# 1 Appendix C – Proposed Revised CCA

2 The following illustrative calculation details our proposed revised formula for the cost of adjustor in the province of  
3 New Brunswick.

NBEUB  
Proposed Revised Cost of Carbon Adjustor

Inputs
Calculations
Linked cell

Step 1 - determine the clean fuels regulation credit price	Units	Reference	Inputs	Source
California low carbon fuels standard ("LCFS") credit	USD\$/tonne	A	70.13	[1]
California low carbon fuels carbon intensity target	gCO2e/MJ	B	89.15	[2]
California renewable diesel carbon intensity	gCO2e/MJ	C	56.26	[3]
Difference	gCO2e/MJ	D=B-C	32.89	
California renewable diesel energy density	MJ/liter	E	34.25	[4]
Conversion factor		F	1,000,000.00	[5]
Exchange rate	CDN\$:USD\$	G	1.37	[6]
Low carbon fuels standard credit price	CDN\$/liter	H=A*D*E/F*G	0.11	
D4 RIN value	USD\$/US gallon	I	0.86	[7]
Renewable diesel RIN equivalence value	USD\$/US gallon	J	1.70	[8]
Exchange rate	CDN\$:USD\$	G	1.3717	
Conversion US gallon to liter		K	3.79	[9]
D4 RIN price	CDN\$/liter	L=I*J*G/K	0.53	
<b>Interim clean fuels regulations credit price</b>	CDN\$/liter	<b>M=H+L</b>	<b>0.64</b>	

[1] - California Air Resources Board ("CARB")

<https://ww2.arb.ca.gov/resources/documents/weekly-lcfs-credit-transfer-activity-reports>

[2] - California Air Resources Board ("CARB")

[https://ww2.arb.ca.gov/sites/default/files/2020-07/2020\\_lcfs\\_fro\\_oal-approved\\_unofficial\\_06302020.pdf](https://ww2.arb.ca.gov/sites/default/files/2020-07/2020_lcfs_fro_oal-approved_unofficial_06302020.pdf)

[3] - California Air Resources Board ("CARB")

<https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities>

[4] - Argus - Methodology and Specifications Guide

[www.argusmedia.com](http://www.argusmedia.com)

[5] - Argus - Methodology and Specifications Guide

[www.argusmedia.com](http://www.argusmedia.com)

[6] - Bank of Canada - 2023-10 Exchange Rate

[www.bankofcanada.ca](http://www.bankofcanada.ca)

[7] - Argus - Issued Weekly

<https://www.argusmedia.com/en/bioenergy/argus-americas-biofuels>

[8] - Code of Federal Regulations (CFR)

<https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-80/subpart-M/section-80.1415>

[9] - 1 US liquid gallon = 3.78541 liters

Step 2 – convert the credit price per liter calculated in Step 1 to a credit price per tonne	Units	Reference	Inputs	Source
Clean fuels regulation liquid class reference carbon intensity	gCO2e/MJ	N	89.20	[10]
Clean fuels regulation renewable diesel default carbon intensity	gCO2e/MJ	O	35.00	[11]
Incremental carbon intensity	gCO2e/MJ	P=N-O	54.20	
Clean fuels regulation renewable diesel energy density	MJ/liter	Q	34.92	[12]
Conversion factor		F	1,000,000.00	
<b>CFR credit price per tonne</b>	CDN\$/tonne	<b>R=M/P/Q*F</b>	<b>335.53</b>	

[10] - Clean Fuel Regulations (SOR/2022-140)

<https://laws-lois.justice.gc.ca/eng/regulations/SOR-2022-140/page-18.html#h-1360777>

[11] - Clean Fuel Regulations (SOR/2022-140)

<https://laws-lois.justice.gc.ca/eng/regulations/SOR-2022-140/FullText.html>

[12] - Clean Fuel Regulations (SOR/2022-140)

<https://laws-lois.justice.gc.ca/eng/regulations/SOR-2022-140/page-19.html#h-1360785>

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Step 3 – apply the CFR adjustor from Step 2 by fuel type i.e. 1) ultra-low sulfur diesel and 2) gasoline.					
	Units	Reference	Gasoline	Diesel	Source
Clean fuels regulations default carbon intensity	gCO <sub>2</sub> e/MJ	S	95.00	93.00	[13]
Clean fuels regulation carbon target	gCO <sub>2</sub> e/MJ	T	91.50	89.50	[14]
Incremental	gCO <sub>2</sub> e/MJ	U=S-T	3.50	3.50	
Clean fuels regulation energy density	MJ/liter	V	34.69	38.65	[15]
Conversion factor		F	1,000,000.00	1,000,000.00	
<b>Proposed Cost of Carbon Adjustor</b>	CDN\$/liter	<b>W=R*U*V/F</b>	<b>0.0407</b>	<b>0.0454</b>	

[13] - Clean Fuel Regulations (SOR/2022-140) <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2022-140/page-2.html#h-1358853>

[14] - Clean Fuel Regulations (SOR/2022-140) <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2022-140/page-2.html#h-1358853>

[15] - Clean Fuel Regulations (SOR/2022-140) <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2022-140/page-19.html#h-1360785>

Step 4 – calculate credit price per tonne for compliance fund					
	Units	Reference	Inputs	Source	
CFR compliance fund price per tonne in 2022	CDN\$/tonne	X	350.00		[16]
Consumer price index current year		Y	156.62		[17]
Consumer price index 2022		Z	151.24		[18]
<b>CFR compliance fund price per tonne in 2023</b>		<b>AA=X*(Z/Y)</b>	<b>337.98</b>		

[16] - Clean Fuel Regulations

[17] - Bank of Canada

[18] - Bank of Canada

[SOR-2022-140.pdf \(justice.gc.ca\)](#)

[Consumer price index - Bank of Canada](#)

[Consumer price index - Bank of Canada](#)

Rolling average of monthly total CPI

Average monthly total CPI

Step 5 – apply the CFR adjustor from Step 4 by fuel type i.e. 1) ultra-low sulfur diesel and 2) gasoline.					
	Units	Reference	Gasoline	Diesel	Source
Clean fuels regulations default carbon intensity	gCO <sub>2</sub> e/MJ	AB	95.00	93.00	[13]
Clean fuels regulation carbon target	gCO <sub>2</sub> e/MJ	AC	91.50	89.50	[14]
Incremental	gCO <sub>2</sub> e/MJ	AD=AB-AC	3.50	3.50	
Clean fuels regulation energy density	MJ/liter	AE	34.69	38.65	[15]
Conversion factor		AF	1,000,000.00	1,000,000.00	
<b>Proposed Cost of Carbon Adjustor for 10% compliance fund</b>	CDN\$/liter	<b>AG=AA*AD*AE/AF</b>	<b>0.0410</b>	<b>0.0457</b>	

Step 6 - combined cost of carbon adjustor					
	Units	Reference	Gasoline	Diesel	Source
Combined Cost of Carbon Adjustor					
Percentage of compliance achieved from renewable diesel		AH	90%	90%	
Percentage of compliance from compliance fund		AI	10%	10%	
<b>Combined Cost of Carbon Adjustor</b>	CDN\$/tonne	<b>AD = W*AH+AG*AI</b>	<b>0.0408</b>	<b>0.0454</b>	



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