



NEW BRUNSWICK
ENERGY & UTILITIES BOARD

COMMISSION DE L'ÉNERGIE ET DES SERVICES PUBLICS
NOUVEAU-BRUNSWICK

DECISION

IN THE MATTER OF the review of a mechanism to set the cost of carbon adjustor pursuant to section 14(2.1) of the *Petroleum Products Pricing Act*, S.N.B. 2006, c. P-8.05 and section 13.2 of the *General Regulation – Petroleum Products Pricing Act*, N.B. Reg. 2006-41.

(Matter No. 566)

April 24, 2024

Matter 566 – Cost of Carbon Adjustor

IN THE MATTER OF the review of a mechanism to set the cost of carbon adjustor pursuant to section 14(2.1) of the *Petroleum Products Pricing Act*, S.N.B. 2006, c. P-8.05 and section 13.2 of the *General Regulation – Petroleum Products Pricing Act*, N.B. Reg. 2006-41. (Matter No. 566)

ORAL HEARING: January 29 and 30, 2024

NEW BRUNSWICK ENERGY AND UTILITIES BOARD:

Presiding Chair	Christopher Stewart
Vice-Chairperson	Stephanie Wilson
Member	Heather Black

PARTICIPANTS:

Advanced Biofuels Canada Association	Timothy Auger
Canadian Fuels Association	Carol Montreuil
Conservation Council of New Brunswick	Kostantina Northrup
Convenience Industry Council of Canada	David Knight
Imperial Oil	Elamin Sobair
The Scholten Group	Jerry Scholten

PUBLIC INTERVENER: Alain Chiasson

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1 Introduction and Summary Conclusion

- [1] This decision is a review of the appropriateness of the interim mechanism the Board established in Matter 549 for setting the “cost of carbon adjustor”, as permitted by section 14(2.1) of the *Petroleum Products Pricing Act* (Act) and section 13.2 of the *General Regulation – Petroleum Products Pricing Act* (Regulation). The Board uses the cost of carbon adjustor when calculating maximum petroleum product prices under the Act.
- [2] For the reasons below, the Board determines that an interim cost of carbon adjustor mechanism continues to be appropriate pending further development of the Canadian carbon credit market and sets the formula and inputs in Appendix A as the mechanism for calculating the cost of carbon adjustor on an interim basis. The new mechanism maintains the fundamental assumption of the current cost of carbon adjustor that primary suppliers will achieve compliance with the federal *Clean Fuel Regulations* primarily by importing renewable diesel but lowers the carbon intensity assumptions for renewable diesel and assumes that compliance may be achieved, in part, by contributing to the regulated compliance fund.
- [3] The Board will review the ongoing appropriateness of the interim cost of carbon adjustor in late 2024 and will establish a review process with the objective of evaluating developments in the Canadian carbon credit market and examining the methodology itself.

2 Overview

- [4] The cost of carbon adjustor (CCA) was created by the Act and Regulation in December of 2022 as an additional component of the maximum petroleum prices set by the Board. The statutory purpose of the CCA is to mitigate the effect on wholesalers and retailers of costs primary suppliers of liquid petroleum products incur to comply with the federal carbon intensity standards imposed by the *Clean Fuel Regulations* under the *Canada Environmental Protection Act*.
- [5] The Board outlined the stated goals and regulatory approach of the *Clean Fuel Regulations* in its Matter 549 decision. In that proceeding, the Board established a formula for setting the CCA as an interim measure because the Canadian market for carbon credits was not yet sufficiently mature and liquid and related data was not readily available or representative. Grant Thornton, the expert consultants engaged by Board staff in Matter 549, proposed a formula using a proxy for a Canadian carbon credit price based on the assumption that compliance in Atlantic Canada will be achieved primarily by importing renewable diesel. The evidentiary basis supporting that assumption was

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consultation with industry and their understanding that other compliance pathways are not as available in Atlantic Canada as they may be in other parts of Canada. The Board accepted Grant Thornton’s proposal as the basis for the interim CCA formula.

- [6] The current interim CCA mechanism formulates a proxy value for the Canadian carbon credit price that approximates the difference between the prices of renewable diesel and low-sulphur diesel, where the price of renewable diesel is determined with reference to the California Low Carbon Fuel Standard credit price and the U.S. trading price for renewable diesel credits, known as D4 RIN pricing. The formula converts this value into a credit price per tonne using assumed carbon intensities and applies the resulting adjustor to ultra-low sulphur diesel and gasoline.
- [7] In its Matter 549 Decision, the Board also expressed an intention to conduct a review of the ongoing appropriateness of the mechanism in approximately six months’ time. This proceeding is that review. In this proceeding, Board staff engaged Grant Thornton to review the current CCA formula, carbon adjustor formulae in other jurisdictions and the position of Environment and Climate Change Canada as outlined in correspondence with the Board dated May 26, 2023, and to offer its opinion as to whether changes in the formula are warranted. Grant Thornton filed its report with the Board on December 8, 2023. In it, Grant Thornton concluded that developments in the Canadian carbon credit market do not warrant changes to the interim CCA formula and noted that the market is expected to reach maturity in 12 to 18 months. Grant Thornton also concluded that it would be reasonable to adjust the formula to allow up to ten percent of compliance to be achieved by contributing to the compliance fund established under the *Clean Fuel Regulations* in periods where it would produce cost savings for primary suppliers.
- [8] Advanced Biofuels Canada, the Canadian Fuels Association, the Conservation Council of New Brunswick, the Convenience Industry Council of Canada, the Scholten Group, and the Public Intervener intervened in the proceeding. Advanced Biofuels Canada and the Public Intervener filed expert opinion evidence challenging the assumptions and inputs of the current formula, particularly the assumption that suppliers will achieve compliance by importing renewable diesel and the assumed carbon intensity values.

3 Issues

- [9] The Board must decide:
1. whether the Canadian carbon credit market has reached sufficient maturity and liquidity to discontinue use of an interim CCA mechanism and, if not;

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2. whether the assumptions and inputs of the current mechanism are reasonable, particularly the use of a proxy credit price and assumptions relating to compliance pathways, carbon intensities, and transportation costs; and
3. when the next review of the interim mechanism should be conducted and what process should be followed.

4 An interim CCA mechanism continues to be appropriate

- [10] The Board determined in Matter 549 that an interim CCA mechanism is appropriate while the Canadian carbon credit market matures and becomes sufficiently liquid. In this proceeding, Grant Thornton noted that market maturity and liquidity can be assessed only after sufficient data is generated over time to evaluate the volume and characteristics of market transactions and concluded in its report that the Canadian market for carbon credits is not yet sufficiently mature and liquid. The report indicated that the industry generally expects the market to mature in 12 to 18 months, at which time it would be appropriate to use Canadian market information to formulate the CCA. In the meantime, Canadian credit pricing is not a reliable basis for the CCA.
- [11] No intervener challenged Grant Thornton’s conclusion that the Canadian carbon credit market is not yet mature, or liquid and no intervener objected to the continued use of an interim mechanism pending maturity of the market.
- [12] Based on this evidence, the Board finds that the Canadian carbon credit market is not yet mature and sufficiently liquid and concludes that an interim CCA mechanism continues to be appropriate.

5 The Board will retain the mechanism’s foundational assumptions

- [13] The assumption that CFR compliance will be achieved in Atlantic Canada primarily through importing renewable diesel is the foundation of the current CCA mechanism. This assumption continues to be reasonable because there was no evidence before the Board in the form of representative data to support an alternative assumption and because available market intelligence continues to reflect a market that is not yet mature and is not sensitive to regional differences.
- [14] The Board will continue to use the California-based proxy credit price in the current interim CCA formula because it is the only pricing available from a mature carbon credit market and there is insufficient evidence to justify altering the foundational basis of the proxy.

5.1 Representative data is not readily available

- [15] The Board heard from expert witnesses that representative data such as credit prices, compliance pathways, carbon intensities and other compliance cost information is not readily available from industry or the federal government. Primary suppliers consider this information to be commercially sensitive and Environment and Climate Change Canada’s credit and tracking system, known as CATS, does not publish such data, even in aggregated form. Expert witnesses who testified at the hearing indicated that they were denied access to CATS data and acknowledged that is very challenging to obtain this data from industry because of its commercially sensitive nature.
- [16] In conducting this review, the Board is mindful of its obligation under the Act to consider the fact that consumers should benefit from the lowest price possible without jeopardizing the continuity of supply of petroleum products. Ms. Northrup characterized the general understanding among hearing participants that this area of regulation is inherently complex, and Mr. Scholten urged the Board to consider the specific compliance strategies and limitations that will be relevant in the local market.
- [17] The Board agrees with these submissions. Because of the complexity of this task and the unique market characteristics of New Brunswick, the Board considers that any changes to the interim CCA mechanism must be supported by evidence in the form of representative data demonstrating that the assumptions or inputs on which the current mechanism is based are no longer reasonable.

5.2 The renewable diesel compliance pathway assumption is reasonable

- [18] Advanced Biofuels Canada Association and the Public Intervener challenged the current interim mechanism, chiefly because it rests on the assumption that suppliers will achieve CFR compliance primarily by importing renewable diesel instead of blending ethanol and biodiesel. The Conservation Council of New Brunswick similarly urged the Board to reconsider this assumption and questioned whether it leads to an overstatement of compliance costs that is unfair to consumers.
- [19] Ms. Angie Brown, a partner with Grant Thornton and the primary author of Grant Thornton’s report, testified at the hearing. She was qualified as an expert in petroleum product models, carbon compliance credit markets and cost of carbon adjustor mechanisms related to carbon reduction initiatives in liquid fossil fuels. Ms. Brown testified that her consultations with industry participants revealed other possible compliance pathways, such as ethanol blending, but that renewable diesel is the most likely path to CFR compliance in Atlantic Canada. She concluded that this assumption is

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appropriate for the purposes of the interim CCA formula because the Board would require data from primary suppliers to accurately incorporate the quantities and costs of ethanol and biodiesel blending and other costs of compliance into a weekly price-setting calculation. She noted that obtaining such data would present a significant challenge for the Board due to its commercial sensitivity.

- [20] Expert witnesses who testified on behalf of Advanced Biofuels Canada Association (ABFC) and the Public Intervener opined that Grant Thornton’s assumption overstates CFR compliance costs because rational primary suppliers would choose lower-cost compliance options, such as ethanol and biodiesel blending, wherever possible. However, neither intervener submitted representative data to the Board regarding current and future compliance pathways or compliance costs that would support an alternative methodology.
- [21] ABFC agreed that renewable diesel is likely a long-term CFR compliance solution, but questioned why Grant Thornton would apply such an assumption to an interim near-term period. ABFC filed a report authored by its Director of Research, Mr. Timothy Auger. Mr. Auger was qualified to give expert opinion evidence in the areas of fuel markets and fuel pricing models, low carbon fuel regulations, carbon compliance credit markets, fuel life cycle assessment, and cost of carbon adjustor mechanisms relating to carbon production initiatives and liquid fuels. The ABFC report modelled what Mr. Auger considered to be plausible compliance scenarios based primarily on blending lower-cost renewable fuels that accounted for some “giveaway” of compliance benefits in recognition of the competitive nature of the market. ABFC did not offer an alternative formula but recommended that the Board establish a formula and inputs through consultation with industry and by purchasing market data from market intelligence services.
- [22] Mr. Auger recommended that the Board purchase data from market intelligence services because, in his view, those services are best positioned to produce a reliable analysis that reflects the entire market. He acknowledged, however, that the market is “nascent” and that robust and representative data is not yet available. This characterization of the state of the Canadian carbon credit market is consistent with that of Ms. Brown. Based on this evidence, the Board concludes that it would be premature to adopt a CCA mechanism based on data published by market intelligence services because it continues to reflect a market that has not reached maturity.
- [23] The Public Intervener filed the report of R Cube in which the author, Mr. Vijay Muralidharan, recommended using Argus’s published “Canada CFR cost” as the basis for the interim CCA mechanism. Mr. Muralidharan was qualified to give expert opinion

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evidence in the areas of regulatory economics, petroleum product market and pricing regulation, and economic analytical modelling of energy prices. In his view, Argus uses assumptions that better reflect market realities, including an assumption that Canadian primary suppliers will achieve CFR compliance by blending lower-cost renewable fuels. The Board will not adopt this recommendation. The Board finds that the CFR compliance cost reported by Argus is not representative of compliance costs in New Brunswick. The Board agrees with Ms. Brown, who cautioned that it is logical to conclude that CFR compliance costs are lower in other Canadian jurisdictions than they are in Atlantic Canada because primary suppliers in other jurisdictions had previously incurred renewable energy compliance costs, making the incremental cost of complying with the requirements of the *Clean Fuel Regulations* lower in those jurisdictions.

- [24] While the Board accepts that primary suppliers in the Canadian market may pursue other compliance pathways, the Board concludes that this evidence does not impugn the reasonableness of the renewable diesel assumption as the foundation of the interim CCA mechanism because it is not supported by representative data and because available market intelligence continues to reflect a market that has not reached maturity and may ignore relevant regional differences.

5.3 The California LCFS-based proxy is reasonable

- [25] The current interim CCA mechanism formulates a proxy value for the Canadian carbon credit price by combining two components: the California Low Carbon Fuel Standard credit price and the U.S. federal incentive payment based on the U.S. trading price for renewable diesel credits, known as D4 RIN pricing. Grant Thornton did not propose to adjust this component of the current formula.
- [26] The British Columbia Low Carbon Fuel Standard credit market and the credit clearing mechanism established under the *Clean Fuel Regulations* were discussed at the hearing as potential Canadian-based proxy prices. No expert witness recommended these proxies, and no party asked the Board to adopt them.
- [27] Ms. Brown cautioned that more data is needed before she can conclude that the British Columbia carbon credit market is mature and a reliable proxy for the Board's use. She recommended that the Board continue using the current proxy while monitoring the trading volume and characteristics of the British Columbia market in tandem with the federal government trading system to consider its maturity and whether it is reflective of Canadian trading activity. Mr. Muralidharan also acknowledged that California LCFS pricing is an acceptable basis for a carbon credit price proxy because it is the only available mature market pricing.

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- [28] The credit clearing mechanism (CCM) is a process established in the *Clean Fuel Regulations* by which credit producers can sell their credits at a maximum price of \$300 plus inflation. Both Ms. Brown and Mr. Auger pointed out that credit producers are not obligated to use the CCM. In Ms. Brown's view, it is reasonable to assume that a credit producer would put their credits into the CCM only if no higher price is available on the market. She testified that she is aware of active contractual arrangements for purchasing credits outside the CCM and that it is highly likely that trading outside the CCM is at a higher price because of limited supply. Mr. Auger similarly noted that there is no guarantee that the CCM will be a functioning market because credit producers may not choose to avail themselves of that system.
- [29] The Board will not adopt the British Columbia LCFS credit price or the CCM price as the proxy credit price for the interim CCA formula. The Board acknowledges Ms. Brown's observations that the CCM price would have the benefit of consistency within Atlantic Canada, at least temporarily, and would be transparent and stable in the face of regulation that is difficult to understand. However, the evidence before the Board in this proceeding does not indicate that the CCM price or the British Columbia LCFS credit price is sufficiently representative of a market-based credit price to be used as the basis for the interim CCA mechanism.
- [30] Mr. Muralidharan recommended removing the RIN component of the proxy because, in his view, it double counts the cost of importing renewable diesel to the extent that a U.S. renewable diesel supplier cannot take advantage of RIN pricing and California carbon credit pricing for the same unit of fuel. Ms. Brown disputed this conclusion. She explained that the sum of these two components represents the opportunity cost to a U.S. renewable diesel supplier who exports its product to Canada.
- [31] The Board concludes that Mr. Muralidharan's evidence does not rebut that of Ms. Brown because he did not specifically dispute Ms. Brown's underlying rationale. Alternatively, R Cube recommended accounting for more ethanol blending by incorporating D6 RIN pricing into the proxy. The Board does not accept this recommendation as it is inconsistent with the Board's conclusion in Section 5.2 of this Decision.

6 The Board will adjust the mechanism where justified

- [32] The Board will adjust the carbon intensity assumption for renewable diesel and add an assumption that suppliers will contribute to the compliance fund because there is a sufficient evidentiary basis for adjusting those components of the current interim CCA mechanism. The Board will maintain the baseline carbon intensity of gasoline and diesel

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and will not add transportation costs to the formula because there is no evidentiary basis for adjusting those components of the mechanism at this time.

6.1 The Board will adjust the assumed carbon intensity of renewable diesel

[33] The current CCA mechanism assumes a carbon intensity for renewable diesel of 35 grams of CO₂ equivalent per megajoule, which is the “default” carbon intensity indicated in the *Clean Fuel Regulations*. Grant Thornton did not propose to adjust this component of the formula. Ms. Brown testified that the benefit of using this value is that it is stable over time, whereas other sources report widely varying carbon intensities that depend on the properties of particular products.

[34] Messrs. Auger and Muralidharan disputed the 35gCO₂e/MJ carbon intensity assumption for renewable diesel and recommended using lower values. Mr. Auger noted that this value was set by regulation to facilitate the transition to the CFR and no longer represents Environment and Climate Change Canada’s approach to calculating carbon intensity. He testified that a range of 20 to 29 is representative of the carbon intensities for renewable diesel that life cycle assessment professionals are calculating. He expects the range to narrow over time. Mr. Muralidharan recommended that the Board adopt the carbon intensity assumption of 29gCO₂e/MJ for renewable diesel used by Argus in its modelling, which is based on federal government projections.

[35] The Board finds that a carbon intensity of 29gCO₂e/MJ is representative of carbon intensities for renewable diesel in Canada and will adjust the interim CCA formula accordingly.

6.2 The Board will assume that suppliers will contribute to the compliance fund

[36] The *Clean Fuel Regulation* gives primary suppliers the opportunity to achieve up to ten percent of their compliance obligations by contributing to a compliance fund at a price of \$350 (adjusted for inflation). Grant Thornton recommended that the Board revise the interim formula to assume that primary suppliers will pursue this compliance pathway in periods in which the carbon credit price is greater than the regulated compliance fund price.

[37] The Canadian Fuels Association agreed that this is a reasonable adjustment to the interim CCA mechanism. No other intervener made submissions on this issue.

[38] The Board will adjust the interim CCA formula as recommended by Grant Thornton. The Board is persuaded by Ms. Brown’s testimony that a reasonable and prudent party would

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choose to invest in the CFR compliance fund in cases where it was the lower-cost compliance alternative.

6.3 The Board will maintain the baseline carbon intensity of gasoline and diesel

[39] The current interim CCA mechanism uses the CFR “default” carbon intensities of 95gCO₂e/MJ for gasoline and 93gCO₂e/MJ for diesel. These values are used to set a baseline for calculating the incremental cost of complying with the CFR. Grant Thornton does not propose to adjust this component of the formula.

[40] ABFC and R Cube challenged the formula on the basis that the failure to account for renewables that were already in the fuel supply before the CFR came into force will cause the formula to overstate compliance costs. Ms. Brown testified that Grant Thornton does not propose to account for pre-existing renewables in the baseline carbon intensity values because the compliance advantage of any pre-existing renewables depends on the actual blends used by primary suppliers at the time. While Mr. Auger offered what he considered plausible pre-existing renewable blends and R Cube suggested that an assumption based on mandatory minimums under the now-repealed *Renewable Fuels Regulations* would be reasonable, they both cautioned that more data is needed to support a particular adjustment to the formula.

[41] The Board will not adjust the CCA mechanism at this time to account for pre-existing renewables. The Board accepts the expert evidence that more data is needed to establish representative values for the baseline carbon intensity of gasoline and diesel that incorporate renewable blends. The Board does not consider the previous existence of the federal *Renewable Fuels Regulations* to be a sufficient basis for an adjustment because the implications, if any, for the fuel supply in New Brunswick are unknown.

6.4 The Board will not add transportation costs

[42] The Board’s decision in Matter 549 indicated that this review would consider the appropriateness of including a published transportation cost in the CCA formula.

[43] Grant Thornton considered whether an adjustment to the current CCA mechanism was warranted to reflect the costs associated with transporting renewable diesel to New Brunswick. Based on their work in other Atlantic Canadian jurisdictions, Grant Thornton concluded that local stakeholders are not concerned about the absence of a specific line item in the interim CCA mechanism to account for transportation costs. Further, it is unclear to Grant Thornton whether or to what extent transportation costs are embedded in the components of the credit price proxy. While Messrs. Auger and Muralidharan both noted that transportation costs are a relevant component of petroleum fuel prices,

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neither recommended an adjustment to the formula and no intervener made submissions on this issue.

[44] The Board will not add a specific line item in the interim CCA mechanism at this time to account for transportation costs because there is no evidentiary basis on which to support such an adjustment.

7 Conclusion

[45] For the reasons in this Decision and in accordance with s. 14(2.1) of the Act, the Board orders that the cost of carbon adjustor be adjusted by:

1. lowering the carbon intensity assumption for renewable diesel from 35 gCO₂e/MJ to 29gCO₂e/MJ; and
2. adding an assumption that up to ten percent of CFR compliance will be achieved through contributions to the compliance fund in periods in which the proxy credit price is greater than the cost of contributing to the fund.

[46] The Board establishes the formula and its inputs attached as Appendix “A” as the mechanism for setting the cost of carbon adjustor component of maximum motor fuel prices calculated according to the Act and the Regulation. The new adjustor will be implemented on the regular weekly price setting on May 3rd, 2024 and will be calculated weekly.

8 The Board will review the mechanism in late 2024

[47] The Board shares Grant Thornton’s view that it is appropriate to continue to review the interim CCA mechanism every six months. No intervener opposed this approach.

[48] Ms. Brown suggested that the Board may wish to simply evaluate developments in the Canadian carbon credit market and delay reviewing the methodology itself until after the two-year anniversary of the *Clean Fuel Regulations*. However, the Board is persuaded by the expert evidence and submissions of the interveners that an analysis of industry or federal government data, if that data becomes available to the Board, may justify other changes to the interim CCA mechanism. The Board also recognizes that the evidentiary value of market intelligence data or the British Columbia credit market data will improve as the market continues to mature.

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[49] Therefore, the Board will conduct a review of the interim CCA mechanism in late 2024, with the objective of evaluating developments in the Canadian carbon credit market and examining the methodology itself.

Dated at Saint John, New Brunswick, this 24th day of April, 2024.



Christopher Stewart
Presiding Chair



Stephanie Wilson
Vice-Chairperson



Heather Black
Member

Appendix A

Matter 566 - Appendix A (Cost of Carbon Adjustor Formula - Modified)

Step 1 Determine the Clean Fuel Regulation credit price

	Units	Reference	Inputs	Source
California LCFS credit	USD / tonne	A	TBD	Note 1
California low carbon fuel intensity target	gCO ₂ e/MJ	B	TBD	Note 2
California renewable diesel carbon intensity	gCO ₂ e/MJ	C	TBD	Note 3
Difference	gCO ₂ e/MJ	$D = B - C$		
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
Low carbon fuel standard credit price	\$CDN / litre	$H = A * D * E / F * G$		
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	
D4 RIN Price	\$CDN / litre	$L = I * J * G / K$		
Interim clean fuel credit price	\$CDN / litre	$M = H + L$		

Step 2 Convert the credit price per litre calculated in Step 1 to a credit price per tonne

	Units	Reference	Inputs	Source
<i>Clean Fuel Regulations</i> liquid class reference carbon intensity	gCO ₂ e/MJ	N	TBD	Note 9
Renewable diesel carbon intensity (Matter 566)	gCO ₂ e/MJ	O	29	Note 10
Incremental carbon intensity	gCO ₂ e/MJ	$P = N - O$		
<i>Clean Fuel Regulations</i> renewable diesel energy density	MJ / litre	Q	34.921	Note 11
Conversion factor		F	1,000,000	Note 12
CFR credit price per tonne	\$CDN / tonne	$R = M / P / Q * F$		

Step 3 Apply the CFR adjustor from Step 2 by fuel type (ULSD & gasoline)

	Units	Reference	Gasoline	ULSD	Source
<i>Clean Fuel Regulations</i> default (baseline) carbon intensity	gCO ₂ e/MJ	S	95.00	93.00	Note 13
<i>Clean Fuel Regulations</i> target	gCO ₂ e/MJ	T	TBD	TBD	Note 14
Incremental carbon intensity	gCO ₂ e/MJ	$U = S - T$			
<i>Clean Fuel Regulations</i> energy density	MJ / litre	V	34.69	38.65	Note 15
Conversion factor		F	1,000,000	1,000,000	Note 5
Cost of Carbon Adjustor	\$CDN / litre	$W = R * U * V / F$			

Step 4 Calculate the credit price per tonne for compliance fund

	Units	Reference	Inputs	Source
CFR compliance fund price per tonne in 2022	\$CDN / tonne	X	350.00	Note 16
Consumer price index, current year		Y	TBD	Note 17
Consumer price index, 2022		Z	151.2	Note 18
CFR compliance fund, price per tonne, current year		$AA = X * (Y / Z)$		

Step 5 If the CFR credit cost per tonne at Step 4 is greater than the credit cost per tonne at Step 2, then the Cost of Carbon Adjustor is the amount(s) at Step 3. Otherwise, the Cost of Carbon Adjustor is the amount(s) at Step 7.

Step 6 Apply the CFR adjustor from Step 4 by fuel type (ULSD & gasoline)

	Units	Reference	Gasoline	ULSD	Source
<i>Clean Fuel Regulations</i> default (baseline) carbon intensity	gCO ₂ e/MJ	S	95.00	93.00	Note 13
<i>Clean Fuel Regulations</i> target	gCO ₂ e/MJ	T	TBD	TBD	Note 14
Incremental carbon intensity	gCO ₂ e/MJ	$U = S - T$			
<i>Clean Fuel Regulations</i> energy density	MJ / litre	V	34.69	38.65	Note 15
Conversion factor		F	1,000,000	1,000,000	Note 5
Cost of Carbon Adjustor for 10% compliance fund	\$CDN / litre	$AB = AA * U * V / F$			

Step 7 Combined cost of carbon adjustor

	Units	Reference	Gasoline	ULSD
Percentage of compliance achieved from renewable diesel		AC	90%	90%
Percentage of compliance achieved from compliance fund		AD	10%	10%
Combined Cost of Carbon Adjustor		$AE = W * AC + AB * AD$		

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. <i>LCFS Carbon Intensity Benchmarks for 2011 to 2030 for Diesel Fuel and Fuels Used as a Substitute for Diesel Fuel</i> (Page 55 of the Regulation) (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, page 8, Energy density of renewable diesel (129.65 MJ/gal) / 3.7854 = 34.25 MJ/litre) (fixed).
5	Convert tonnes to gCO ₂ e/MJ - divide by 1 million.
6	Weekly USD/§CDN 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	<i>Clean Fuel Regulations</i> , Schedule 1, Reference Carbon Intensity, Liquid class (current year).
10	NBEUB Decision - Matter 566 (fixed).
11	<i>Clean Fuel Regulations</i> , Schedule 2, Energy Density of Fuels (Item 10 – Hydrogenation-derived renewable diesel) (fixed).
12	Convert gCO ₂ e/MJ to tonnes - multiply by 1 million.
13	<i>Clean Fuel Regulations</i> , Section 5(3), Baseline Carbon-Intensity (fixed).
14	<i>Clean Fuel Regulations</i> , Section 5(1), Fuel Carbon-Intensity Limits (current year).
15	<i>Clean Fuel Regulations</i> , Schedule 2, Energy Density of Fuels (Item 9 – Gasoline & Item 13 - Diesel) (fixed).
16	<i>Clean Fuel Regulations</i> , Section 118, Contribution to funding program (fixed).
17	Statistics Canada, Consumer Price Index, most recent calendar year (average of the twelve months).
18	Statistics Canada, Consumer Price Index, 2022 (fixed).