

Recommendations to strengthen Canada's forthcoming Clean Fuel Regulation

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Purpose

The Clean Fuel Regulations have tremendous potential to drive down Canada's GHG emissions. This note provides an evaluation of the GHG emission impact of ECCC's March 2022 update to the draft Clean Fuel Regulation. It then proposes recommended actions to increase the GHG emission reduction potential of the policy by 2030.

Background

- On March 25, 2022, ECCC hosted an information session and presented updates to the draft CFR ("Spring 2022 updates"). A nominal increase was made to the carbon intensity reduction requirement from 12 grams CO₂e/MJ in 2030 to 14 grams CO₂e/MJ. This is equivalent to a 16% reduction requirement relative to the 2016 Canadian average fuel carbon intensity.
- Pembina commissioned Navius Research in 2021 to quantify the GHG emission and economic impacts of the draft CFR, as represented in the Dec. 2020 publication of Canada Gazette, Part 1 (CG1). Additional analysis was conducted to evaluate the impacts of the Spring 2022 updates.
- In addition, Pembina evaluated two scenarios where the CFR is strengthened by increasing the carbon intensity (CI) reduction requirement to 20% and 30% relative to 2016 in 2030. These stringency increases are equivalent to an 18 gram CO₂e/MJ and 27 gram CO₂e/MJ reduction requirement by 2030, respectively.

Key findings

- The CFR's incremental GHG reduction effectiveness has decreased since it was first reported in the CG1 Regulatory Impact Analysis Statement.

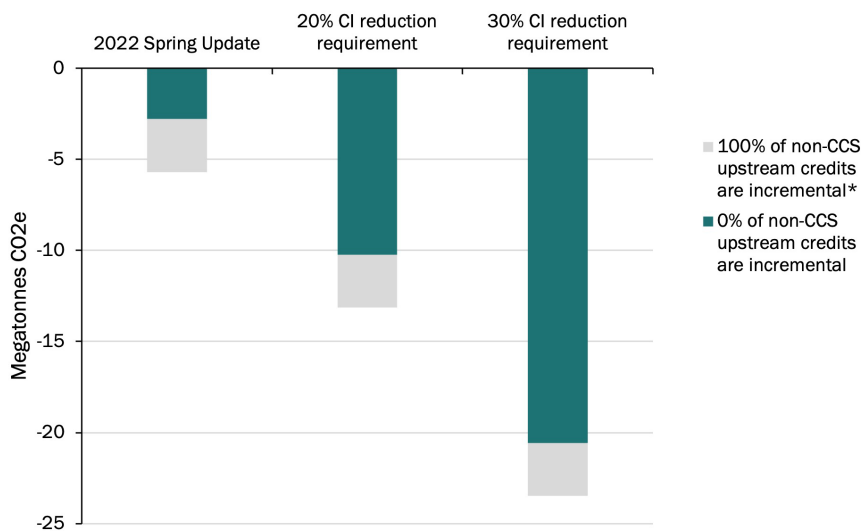
- Indeed, accounting for the Spring 2022 updates, the CFR is expected to yield an incremental reduction in GHG emission of **only 3 to 6 million tonnes (Mt) by 2030** (Figure 1), depending on the additionality of CFR credits generated through actions such as refinery process improvements and methane conservation. This falls short of the expected effectiveness of the policy, particularly as compared with early aspirations, and remains comparatively lower than the typical impact of a low carbon fuel standard in B.C. and other jurisdictions.
 - B.C.’s low-carbon fuel standard (LCFS) achieved annual emissions reductions of 2.1 Mt in 2020 alone.¹
 - California’s LCFS achieved annual emissions reductions of more than 9.5 Mt by 2018, seven years after its original implementation. More recent compliance data by California Air Resources Board shows this program regularly achieves upwards of 12 Mt of annual emission reductions;² while fourth quarter results have yet to be announced, compliance year 2021 appears on track to achieve over 14 Mt of reductions.
- CFR’s credit generation is expected to be largely non-incremental due to overlapping provincial and federal policies such as the carbon tax, B.C. and Quebec zero-emission vehicle (ZEV) mandates, and Ontario’s renewable fuel regulations. These policies are expected to facilitate market behaviours and CFR-eligible compliance activities that would occur in the CFR’s absence. The introduction of new ZEV sales mandate on light-duty vehicles would, all else being equal, further decrease the effectiveness of the regulation.
- Other developments and recent policy commitments suggest that incremental emissions reductions, as estimated in the present analysis, may be even further overstated. This analysis included neither a ZEV sales mandate for heavy-duty vehicles, nor an emissions cap on the oil and gas sector, both of which were announced under the March 2022 Emissions Reduction Plan. These nascent commitments, together with planned or proposed increases in the stringency of provincial transportation policies, will increase the risk of policy overlap and diminish the effectiveness of the CFR.

¹ B.C. Ministry of Energy, Mines and Low Carbon Innovation, *Renewable and Low Carbon Fuel Requirements Regulation Summary: 2010-2020*, 11. https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/transportation/renewable-low-carbon-fuels/rpcf007-2020_-_summary_2010-20.pdf

² California Air Resources Board, “Low Carbon Fuel Standard Reporting Tool Quarterly Summaries.” <https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-reporting-tool-quarterly-summaries>

- Therefore, the CFR must be further strengthened to achieve its policy objectives (Figure 1):
 - By increasing the CFR’s GHG intensity reduction requirement from 16% to 20% in 2030, Canada could potentially achieve an additional 6 Mt reductions by 2030, for a total of **up to 12 Mt incremental reductions by 2030**.
 - A more stringent policy (30%) could deliver a total of **up to 23 Mt reductions by 2030**, about **3.8 times** more than what could be achieved under the current proposal.

Figure 1. GHG reductions under the current CFR and increased stringency CFR scenarios in 2030 relative to the \$170 carbon tax baseline

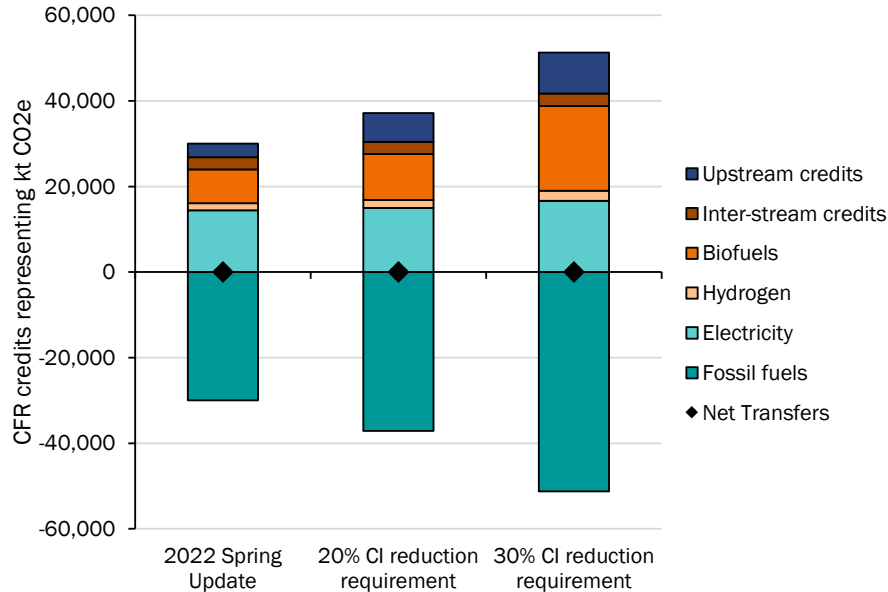


Source: Navius Research

*The Canada Gazette Part I Regulatory Impact Analysis assumes that 2.3 Mt CO₂e in credits will be generated through upstream actions such as methane conversion and refinery process improvements in 2025 and rise to 2.9 Mt CO₂e in 2030. If these actions can achieve 2.9 Mt of incremental emissions reductions, then total incremental reductions are equal to the green plus the grey column. If the additionality of these actions can't be guaranteed, then total incremental reductions could be up to 2.9 Mt lower (green column only).

- Under the more stringent CFR scenarios, a larger amount of CFR credits is needed to meet credit demand, as the number of credits needed to offset fossil fuel deficits is increased. This results in an increase in credit generation through all compliance options, but especially CCS and liquid biofuels (Figure 2).

Figure 2. Compliance market under the current CFR and increased stringency CFR scenarios in 2030



Source: Navius Research

Recommendations

- Increase the stringency of the CFR:** Increase the CI reduction requirement from 14 grams CO₂e/MJ to at least 18 grams CO₂e/MJ by 2030, to deliver approximately 12 Mt reductions by 2030. At this level, the regulation would remain technically viable and affordable to regulated entities, but achieve a higher impact on climate.

Designing and implementing a more stringent regulation would align with the Net Zero-Emissions Advisory Body, which argued that the CFR should actually be expanded in strength, scope and duration.³ The 2021 Conservative Election Plan also called for a strengthened CFR to match British Columbia in achieving a 20% reduction in CI for transport fuels.⁴
- Ensure balanced credit creation in the regulation:** Clearly articulate *within the regulatory text* that additionality and eligibility criteria for Compliance Category 1 (CC1) projects will be in place to ensure a balanced market share across all clean fuels. The composition of the credit market between different compliance categories should not strongly deviate from each category's share of the life cycle emissions

³ *The Net-Zero Advisory Body's Submission to the Government of Canada's 2030 Emissions Reduction Plan* (Net-zero Advisory Body, 2022), 18. <https://nzab2050.ca/22685/widgets/95630/documents/77441>

⁴ Conservative Party of Canada, *Canada's Recovery Plan* (2021), 80. <https://cpcassets.conservative.ca/wp-content/uploads/2021/09/08200659/e4cd8c0115c3ea0.pdf#page=41>

from conventional transportation fuels. Since the production and processing of fuels is typically no more than one-quarter to one-fifth of total life cycle emissions, this implies that roughly three-quarters of compliance should derive from CC2 and CC3 activities that displace combustion emissions at the tailpipe. While the Quantitative Methodologies will be the primary means of achieving a balanced credit profile, the intent of a balanced market should be signaled in the final regulations (via s. 28-30 of CG1).

3. **Review and monitor regulatory performance:** Monitor the regulation's impact and publish data describing aggregate activity in the compliance credit market on an annual basis. Assess how relevant and potentially overlapping policies may interact with the CFR and adjust accordingly before 2027. The introduction of new zero-emission sales mandates on light- and heavy-duty vehicles is expected to decrease the incremental effectiveness of the CFR as it relates to GHG emission reductions, if the policy design is not adapted accordingly. Policy overlap may also occur with other policy interventions announced in the Emission Reduction Plan such as the GHG cap on oil and gas extraction, unless CC1 additionality criteria are set to avoid credit stacking under the oil and gas cap and the CFR.

Appendix #1

Technical Modelling Key Assumptions

Table 1. 2022 Spring Update CFR simulation assumptions

Item	Assumptions
Carbon reference values and CI reduction requirement	This analysis uses the liquid and gaseous carbon reference values as presented in the 2022 Spring Update. It further includes a stringency increase in life cycle carbon intensity reduction requirement set at 14 grams CO ₂ e/MJ by 2030, revised from the previous value of 12.
Regulated fuels	Light and heavy fuel oils are excluded from the list of regulated fuels.
Upstream credit generation (Compliance Category 1)	Upstream credit generation is aligned with ECCC’s assumption that 2.3 Mt CO ₂ e in credits will be generated in 2025 through actions such as methane conservation and refinery process improvements, rising to 2.9 Mt CO ₂ e in 2030. Credit creation through carbon capture and storage is endogenously simulated by gTech as a function of compliance costs and provincial and federal policies. All CCS projects linked to liquid fossil fuel production are assumed to be considered “additional” and qualify for CFR credit generation.
Fuel blending (Compliance Category 2)	Fuel blending is endogenously simulated by the model as a function of production and transportation costs as well as provincial and federal policies.
Credit generation through fuel switching in transportation (Compliance Category 3)	We use variable electricity carbon intensities based on prior gTech results. This approach accounts for the impact of electricity decarbonization driven by policies such as carbon pricing and regulations, which will impact the CFR credit market and allow for more credit generation through electrification. We assume that 30% of light-duty vehicle home charging will be adequately metered to generate credits under the CFR. This value is uncertain and differs from the 10% of residential charging assumed to be adequately metered to generate credits in the CFR Canada Gazette Part I Regulatory Impact Analysis.
Interstream credit trading	We assume that interstream credit trading remains a CFR credit creation pathway that can be used towards 10% of liquid compliance.
Credit banking	The Canada Gazette Part I Regulatory Impact Analysis (RIA) assumes that about 2 Mt CO ₂ e of banked credits will be used to comply with the CFR in 2025 and that banked credits will drop to zero in 2028 and remain at zero thereafter. We have aligned the assumption on the number of banked credits used in each modelling period with the RIA estimate.

Source: Navius Research