Smart Prosperity Institute

SUBMISSION

TO THE GOVERNMENT OF CANADA ON THE PROPOSED CLEAN FUEL STANDARD

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Introduction

Smart Prosperity Institute welcomes the opportunity to provide comments to the Government of Canada on the Clean Fuel Standard Discussion Paper. Smart Prosperity Institute (formerly Sustainable Prosperity) is a national research network and policy think tank based at the University of Ottawa. We deliver world-class research and work with public and private partners – all to advance practical policies and market solutions for a stronger, cleaner economy.

While Smart Prosperity Institute does not hold expertise in all aspects of low carbon fuel standards, we have developed a significant level of knowledge on general design features of these policies and the role they can play in the transition to a low-carbon economy. Smart Prosperity Institute's comments on design features are presented below, aligned with the elements we think are particularly pertinent to consider in policy design.

For additional information please see Smart Prosperity Institute's recent policy brief, Low Carbon Fuel Standards in Canada.

Commentary

1. Low carbon fuel standards are high impact policy

Smart Prosperity Institute commends the Government of Canada for its work to address greenhouse gas (GHG) emissions from fuel use and its proposal to use a flexible, performance-based regulation. Fuel use represents a major source of emissions in Canada, for example the transportation sector alone accounts for more than 27% of Canada's emissions and continues to grow.[1] If well executed, the Clean Fuel Standard (CFS) has the potential to reduce the carbon intensity of fuels while also incentivizing clean innovation.

The proposed Clean Fuel Standard is a form of low carbon fuel standard (LCFS) – a flexible regulation that specifies mandatory reductions in the GHG intensity of fuels sold within a jurisdiction. If well-designed, an LCFS can play an important role in the package of policy measures implemented to support Canada's transition to a low-carbon economy. Evidence from existing LCFSs shows that they can: (1) lead to significant reductions in GHG emissions, (2) bring important co-benefits in the form of improved health, (3) come at lower cost and induce more innovation than less flexible standards, and (4) be relatively cost effective.

A particularly important feature of a well-designed LCFS is its potential to encourage clean innovation. As a performance-based technology-neutral standard, an LCFS can create immediate emissions intensity improvements while at the same time incentivizing innovation in alternative fuel technologies and infrastructure, and potentially encouraging growth in the alternative fuel sector. As such, not only can LCFSs improve the emissions intensity of the fuel used today, they can encourage clean innovation and help accelerate the clean energy transition.

[1] Government of Canada (2017) National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada, *Canada's submission to the United Nations Framework Convention on Climate Change*.

For these reasons, it may be important to explain the benefits of the CFS as not only emissions intensity improvements,[2] but also clean innovation/technology and economic benefits, along with cleaner air and its associated health benefits.

2. The proposed coverage is novel and requires careful analysis

To date, all LCFSs have applied to transportation fuels only. A unique aspect to the proposed CFS is that it extends beyond gasoline and diesel in the transportation sector to include fuels used in residential and commercial buildings, and industry. Because such broad coverage is novel, there is little evidence available regarding how this major design difference will alter the performance (both environmental and economic) and policy interactions of the CFS.

Regarding policy impacts, the proposed extended scope of the CFS means it will be important to carefully examine how it may impact industry competitiveness, particularly for carbon-intensive and trade-exposed sectors. To this end, while Smart Prosperity Institute applauds the Government's ambitious timeline for creating a Clean Fuel Standard, rigorous analysis of potential policy impacts and interactions is required and should be incorporated into the policy design process.

On that note, thanks to extensive efforts by the OECD and others, there is a growing body of research that provides guidance on how best to design environmental policies. Regarding targets, evidence shows that setting long-term, stringent, and predictable targets is key to good environmental policy and creates an incentive for firms to invest in innovative technologies.[3] In the case of an LCFS, complementing short-term targets with medium- and long-term targets provides industry the policy certainty needed to make investments in innovation and infrastructure for the future to achieve the required emissions intensity reductions.

For best regulatory design, targets should be evidence-based, taking into consideration current and projected costs in setting the baseline and targets. This includes careful examination of the availability and cost of alternative fuels and technologies now and in the future. While Smart Prosperity Institute does not have technical expertise to allow us to provide guidance on what degree of reduction is feasible for specific fuels across Canada's buildings, industry, and transportation sector from a technical and/or practical perspective, we note that British Columbia (BC) recently committed to extending its GHG intensity reduction targets for transportation fuels in its LCFS from 10% by 2020 to 15% by 2030, with a 2010 baseline.

3. Understanding policy interactions is critically important

The economic and environmental effectiveness of the proposed Clean Fuel Standard will be influenced by how it interacts (and potentially overlaps) with existing and planned policies. This

[2] While we note that the CFS has a stated goal of a 30Mt reduction in GHG emissions, its impact is via improvements in emissions intensity.

[3] Johnstone, N., Hascic, I., and Kalamova, M. (2010) Environmental policy characteristics and technological innovation environmental policy characteristics and technological innovation, Economia Politica, XXVII, n. 2, OECD.

is particularly relevant for the CFS as it extends beyond transportation, thus opening up a number of new policy interactions. For example, as the government looks at fuels used in buildings and industries, it raises complex questions regarding the inclusion and accounting of electricity, which has previously been included as a transportation fuel in existing LCFSs.

Canada and the provinces have in place a wide range of policies targeting GHG emissions, which adds to the complexity of the interactions. Understanding all these possible interactions can help guide policy design in order to optimize the CFS's effectiveness, to minimize unintended negative outcomes, to maximize innovation, and to properly attribute policy impacts to ensure additionality.

Emissions pricing

Careful examination of how the Clean Fuel Standard will interact with existing and nascent emissions pricing schemes throughout Canada is required. Combining an LCFS with a carbon price can lead to greater emissions reduction from transportation fuel use than either policy in isolation.[4] However, an LCFS interacts differently with a carbon tax compared to a cap-and-trade system and potential interactions between carbon pricing and an LCFS for sectors outside of transportation remain largely untested. Identifying these interactions will be even more complex due to different provincial designs to carbon pricing set to be in place in all provinces by 2018.

Carbon tax

A carbon tax explicitly prices carbon emissions without setting a fixed quantity of reductions. When the tax covers fuel emissions, as it does in BC and Alberta, an LCFS can create even greater incentives for emission reductions from fuel use by adding an implicit tax to high-intensity fuels and the equivalent subsidy to low-intensity fuels in addition to the explicit price of the carbon tax.[5] For example, in transportation the carbon tax tends to affect consumers' driving patterns and vehicle purchases, while the LCFS reduces the emissions intensity of the fuels used in those vehicles.

Cap and trade

When emissions trading systems (ETSs) and LCFSs coincide, an LCFS may reduce the compliance costs for emitters subject to the ETS because it incentivizes emissions reductions in fuel use, thus reducing demand for ETS permits and putting downward pressure on permit prices. [6] However, the LCFS may not create additional overall emission reductions than what the ETS would otherwise accomplish, but simply displace emissions from fuel use to other sectors.[7] This may result in forcing emissions reductions from fuels that have a higher abatement cost than other sectors, with the trade-off

[4] Holland, S. (2009) Taxes and trading versus intensity standards: Second-best environmental policies with incomplete regulation (leakage) or market power, *Journal of Environmental Economics and Management,* 63(3):375-387.

[5] Yeh, S. and Sperling, D. (2010) Low carbon fuel standards: Implementation scenarios and challenges, *Energy Policy,* 38:6955-6965.

[6] Yeh, S., Witcover, J., Lade, G. E., and Sperling, D. (2016) A review of low carbon fuel policies: Principles, program status and future directions, *Energy Policy,* 97:220-234.

[7] Canada's Ecofiscal Comission (2016) Course correction: It's time to rethink Canadian biofuel policies.

benefit of driving innovation in transportation or other sectors, which faces significant barriers to decarbonisation.

Other LCFSs

At the same time that the Government of Canada is developing a national Clean Fuel Standard, the Government of Ontario is currently developing a modern renewable fuel standard that is expected to apply to the fuel intensity of gasoline, and an existing LCFS is in place in British Columbia. This raises important questions around harmonization or equivalency of the different regimes. Failing to consider these questions could lead to a complex system with dual fuel intensity credit markets working simultaneously with different coverage and fungibility – creating unnecessary complexity for industry.

Renewable fuel standards

Currently, every jurisdiction in Canada is covered by at least one renewable fuel standard (RFS). Canada has an RFS at the federal level while Alberta, BC, Manitoba, Ontario, and Saskatchewan have varied (and in most cases more stringent) renewable fuel mandates. When used in combination an LCFS and RFS can achieve greater GHG emission reductions than an RFS alone.[8,9] This occurs in part by the LCFS encouraging biofuels with lower life cycle emissions. However, existing RFSs incentivize biofuels and not alternative fuels and technologies, resulting in costlier emission reductions than an LCFS alone. For this reason, some argue that existing RFS policies should be removed in favour of a sufficiently stringent technology-neutral LCFS.[10]

Interactions beyond transportation

As previously mentioned, applying an LCFS beyond the transportation sector opens up a suite of other policy interactions across jurisdictions. There are many existing policies that may interact with an LCFS that applies to fuel use in industry and commercial and residential buildings. However, since Canada's national LCFS will be the first policy of its kind to extend beyond transportation fuels, the impacts of these interactions have not been fully explored and will be an obvious area for further research during the policy development process.

To this end, while Smart Prosperity Institute applauds the Government's ambitious timeline for creating a Clean Fuel Standard, rigorous analysis of potential policy impacts and interactions is required.

4. Choice of compliance mechanisms influences economic and environmental performance

[8] Huang, H., Khanna, M, Onal, H., and Chen, X (2013) Stacking low carbon policies on the renewable fuel standard: Economic and greenhouse gas implications, *Energy Policy 56*:5-15.

[9] Whistance, J, Thompson, W. and Meyer, S. (2017) Interactions between California's Low Carbon Fuel Standard and the National Renewable Fuel Standard, *Energy Policy 101:*447-455.

[10] Canada's Ecofiscal Comission (2016) Course correction: It's time to rethink Canadian biofuel policies.

Incorporating alternative pathways to compliance through flexibility mechanisms in policy design helps to reduce the cost of compliance for regulated firms and increases the opportunity for innovation.[11] Well-designed LCFSs include flexibility as a key design feature.

- **Credit trading** allows for intensity reductions to occur where they are most cost-effective, reducing compliance costs.[12] This technology-neutral approach can also be designed to support innovation by allowing other fuels or technologies that reduce GHG intensity of fuel to earn credits and be used in place of required emissions intensity reductions of covered fuels. This unique aspect of a LCFS, by not picking technological winners, incentivizes innovation by supporting any technology capable of achieving the required GHG intensity reductions.
- **Credit banking** between compliance periods creates temporal flexibility for firms to make emissions reductions when they are lowest cost. This can not only reduce compliance costs but also stabilize the price of credits.[13] Credit banking also provides recognition that regulators cannot perfectly predict the rate of future technological advancement and therefore cannot know the optimal, most cost-effective reduction schedule.
- Enacting a **backstop mechanism**, or 'safety-valve', for the cost of credits can enhance predictability and limit potential cost to industry and consumers by setting a price ceiling that is predictable yet still seeks to incentivize innovation. California and BC have enacted different price backstop mechanisms at around $200 per tonne (USD and CAD respectively) for this reason.

While the availability of compliance mechanisms helps to incentivize alternative/low-carbon fuels sources, it complicates the possibility of overlap between initiatives (as noted in point 4 on policy interactions). Achieving the 30Mt emissions reduction goal will require careful policy design that ensures that the compliance mechanisms used are from incremental emissions reductions that would not have occurred otherwise. This may be particularly complicated should electricity (and/or electricity charging stations) be eligible for credit generation.

5. Other considerations

Designing such a broad-based and potentially high-impact policy is an ambitious undertaking and will have far reaching impacts. In our view, specific areas that merit further attention include: transparency and data, equity considerations and the methodology for determining carbon intensity.

Transparency and Data

The proposed policy aims to create an additional 30MT emissions reduction beyond existing policy actions. In order to measure this effect and attribute emissions reductions to policy interventions appropriately, rigorous ex-post analysis will be required. This may present a

[11] Johnstone, N., Hascic, I., and Kalamova, M. (2010) Environmental policy characteristics and technological innovation environmental policy characteristics and technological innovation, Economia Politica, XXVII, n. 2, OECD.
[12] Ibid.
[13] Rubin, J. and Leiby, P. N. (2013) Tradeable credits systems design and cost savings for a national low carbon fuel standard for road transport, *Energy Policy,* 56:16-28.

particular challenge to isolate reductions from the CFS among the many emissions reductions policies in place targeting transportation and other sectors. Regular public reporting and provision of data can help researchers to examine the efficiency and efficacy of the policy in order to inform future policy design. Additionally, public reporting would contribute to the transparency of the policy, provide predictability for businesses, and inform future policy development.

Equity Considerations

While studies are scarce, the proposed Clean Fuel Standard could interact with existing policies to affect fuel and food prices. Price increases could have a disproportional impact on low-income households, rural communities or other socioeconomic groups, and could impact some industry sectors as well. Because LCFSs are still a relatively new form of policy, an understanding of the likely equity impacts would be helpful in order to avoid unintended outcomes.

Determining carbon intensity

Regarding the methodology used for determining carbon intensity, similar existing policies for transportation fuels in BC, California, Oregon, and the European Union all include lifecycle emissions of the covered fuel or technology from production to end-use. However there remains disagreement on the inclusion (or not) of indirect land use change (ILUC). Smart Prosperity Institute does not have expertise in lifecycle emissions accounting, but we note that incentivizing biofuel production can create emissions from ILUC through new farmland replacing forests, grasslands, and other agricultural land, resulting in the release of stored carbon.[14] However, estimating lifecycle GHG emissions is a challenge,[15] with different jurisdictions using different methods. Similarly, some jurisdictions treat different crude feedstocks differently. When emissions from every stage of the life cycle are accounted for, it incentivizes innovation throughout the entire production process; however, when all feedstocks are treated the same, there is no incentive to reduce GHG emissions from feedstock production. Broadly, the implication for policy makers is that there does not yet appear to be a common best practice with respect to this design feature.

Summary

Smart Prosperity Institute commends the Government of Canada for its work to address fuel emissions and its proposal to use a flexible, performance-based regulation that has the potential to reduce carbon intensity as well as incentivize clean innovation. Low Carbon Fuel Standards are a high-impact policy – they can bring significant GHG emission reductions, stimulate clean innovation, and spur growth in some sectors. But they raise important and complex questions about interactions with existing and planned policies that require consideration in the early stages of policy design.

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[14] Melillo, J.M., Reilly, J.M., Kicklighter, D.W., Gurgel, A.C., Cronin, T.W., Paltsev, S., Felzer, B.S., Wang, X., Sokolov, A.P., and Schlosser, C.A. (2009) Indirect emissions from biofuels: how important? *Science*, 326(5958):1397-1399. DOI: 10.1126/science.1180251

[15] Witcover, J., Yeh, S., and Sperling, D. (2013) Policy options to address global land use change from biofuels, *Energy Policy*, 56(1):63-74.