

VIA EMAIL: [lcfr@gov.bc.ca](mailto:lcfr@gov.bc.ca)

January 5, 2018

Dr. Michael Rensing  
Director, Low Carbon Fuels  
Renewable Energy Development Branch  
Energy Mines and Petroleum Resources  
PO Box 9314, Station Provincial Government  
Victoria, BC V8W 9N1

Dear Sir,

**Re: BC Low Carbon Fuel Standard Review**

We appreciate the opportunity to provide our initial comments on the subject review. As indicated by the Province at 2017 launch of the consultations<sup>1</sup>, the Ministry is proposing to review the *Greenhouse Gas Reduction (Renewable and Low Carbon Fuel Requirements) Act* ('Act') and the *Renewable and Low Carbon Fuel Requirements Regulation* ('Regulation') (together, the 'BC-LCFS') and conduct a series of consultations regarding:

- Feasibility of carbon intensity targets, including the potential to require a 15 to 20 percent total reduction in carbon intensity of transportation fuels by 2030
- Policy improvements requiring amendments to the Act and/or Regulation, including cost containment, refinery improvements, improvements to Part 3 Agreements, and recognition of Biojet
- Amendments to the Act and Regulation to address issues identified to date requiring legislative and/or regulatory amendments

Our submission incorporates general comments on the BC-LCFS review and the *Low Carbon Fuels Compliance Pathway Assessment* report ('Pathway Assessment') released as part of the consultation. As per previous reviews of the *Act* and *Regulation*, we will contribute to the review with more detailed analysis and technical information, as specific aspects of the BC-LCFS and fuels markets are considered. In this submission, we have kept our recommendations focused on general issues and look forward to active participation in support of the BC-LCFS review consultations.

*Advanced Biofuels Canada/Biocarburants avancés Canada* Our organization promotes the production and use of low carbon advanced biofuels<sup>2</sup> in Canada, which our members supply to British Columbia, and across North America and to global markets. Our members have invested in advanced biofuels processing and supply chain operations in Canada, and are actively bringing to market the next generation of low carbon biofuels. British Columbia has been a leader in developing markets for low carbon fuels use, and our members are part of the North American advanced biofuels supply chain that delivers sustainable, low carbon advanced biofuels to the province today.

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<sup>1</sup> BC LCFS Consultations (Dec.01-17): <https://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/transportation-energies/renewable-low-carbon-fuels/bc-lcfs-consultations>

<sup>2</sup> Advanced biofuels have GHG reductions of at least 50% below comparable fossil fuels, and are made from sustainable biomass. Canada has approximately 750 M litres of advanced biofuels production capacity.

Advanced Biofuels Canada has provided expert advice to governments on transport fuel regulations and carbon pricing systems since 2005, including working directly with British Columbia on the development of the *Act* and *Regulation* in 2008, and all subsequent reviews and amendments to both the *Act* and *Regulation*.

**Key Recommendations** The purpose of the BC-LCFS is to ensure the province meets its commitments to reduce greenhouse gas (GHG) emissions by targeting emissions in transportation fuels use. In this regard, the BC-LCFS regulatory approach has been highly effective, with documented success throughout the 2010-2016 period.<sup>3</sup> The BC-LCFS complements other measures, such as the BC carbon tax<sup>4</sup> and the Innovative Clean Energy Fund<sup>5</sup>, to achieve GHG emissions reductions in the transportation sector broadly.

Advanced Biofuels Canada's recommendations focus on the suite of actions, including both BC-LCFS specific measures and the complementary measures, that are essential to achieving the GHG emissions reductions by overcoming market barriers and capitalizing on clean economic growth opportunities. A brief discussion of each recommendation follows in the attached appendices.

#### *Low Carbon Fuel Standard - 2020*

1. Maintain the full existing regulatory requirements of the BC-LCFS to 2020
2. Employ, as necessary, the non-compliance provisions in the Regulation

#### *Low Carbon Fuel Standard – 2030*

3. Establish a 2030 carbon intensity reduction level of 15-20%, and a progressively stringent reduction schedule over the 2020 – 2030 period. These carbon intensity reduction requirements should be enacted via amendments to the BC-LCFS by 2018/2019 based on a review of market evidence, life cycle carbon intensity modeling, and compliance scenario modeling of future amendments to the regulation to 2030.

#### *Renewable Fuel Use*

4. Increase the renewable fuel volumetric requirements in regular unleaded gasoline fuel to 10% and in diesel fuels to 5%, by 2020
5. Continue to support the increased use of mid- and high-level blends of low carbon biofuels (ethanol and biodiesel) and cold weather use of biodiesel through Part 3 Agreements under the BC-LCFS

#### *Carbon Pricing*

6. Exempt biofuels from the BC carbon tax on fuel use
7. Adopt an Output-Based Pricing (OBP) system comparable to the Alberta and the federal carbon pricing backstop schemes to ensure competitiveness of emissions intense – trade exposed (EITE) biomass processing and advanced biofuels production facilities in the province

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<sup>3</sup> BC LCFS Regulation Summary (Sep-17): <https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/transportation/renewable-low-carbon-fuels/rpcf-007-2016.pdf>

<sup>4</sup> BC Carbon Tax: [http://www.fin.gov.bc.ca/tbs/tp/climate/carbon\\_tax.htm](http://www.fin.gov.bc.ca/tbs/tp/climate/carbon_tax.htm)

<sup>5</sup> BC ICE Fund: <https://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/innovative-clean-energy-solutions/innovative-clean-energy-ice-fund>

*Clean Transportation Investment*

8. Ensure transportation carbon revenues are ‘recycled’ (re-invested) to specifically support transport sector decarbonization, including the production and use of low carbon fuels (advanced biofuels, electric vehicles, alternative fuels)

**Key Outcomes** The proposed recommendations align broadly with and complement the climate action plans and targeted measures that have recently been announced or implemented across Canada (e.g. federal and provincial carbon pricing systems and fuels regulations, including the federal *Clean Fuel Standard*<sup>6</sup>).

By staying the course on the BC-LCFS to 2020, and establishing a stable and stringent policy signal to 2030, the province will support necessary investments and market responses to ensure an orderly transition to clean, sustainable transportation fuels use in BC. Importantly, these measures will build on an established, proven platform to achieve long-term decarbonization of transportation through to 2050. The amended BC-LCFS, when combined with aligned complementary measures, will drive low cost GHG emissions reductions across the transport sector and capture the benefits of clean economic growth in British Columbia.

BC’s leadership in pioneering the use of low carbon biofuels in Canada is a cornerstone achievement on which to build.<sup>7</sup> We look forward to supporting the BC-LCFS review and to working with you, your colleagues and staff, and fellow stakeholders in the coming months to review and implement the key elements to a new, updated low carbon transportation fuel strategy in British Columbia.

Respectfully submitted,



Doug Hooper, Director Policy & Regulation  
*Advanced Biofuels Canada / Biocarburants avancés Canada*

cc:

Susanna Laaksonen-Craig, Assistant Deputy Minister, MECCS

Les MacLaren, Assistant Deputy Minister, MEMPR

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<sup>6</sup> Government of Canada – *Clean Fuel Standard*: <https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/clean-fuel-standard.html>

<sup>7</sup> Navius Research – *Biofuels Use in Canada 2017*: <http://www.naviusresearch.com/publications/biofuels-in-canada/>

## Appendix I: BC-LCFS Recommendations

### **Low Carbon Fuel Standard - 2020**

1. Maintain the full existing regulatory requirements of the BC-LCFS to 2020

*Discussion:* As evidenced by North American regulatory results on measures to reduce GHG emissions in transport fuels and increase adoption of renewable fuels, it is possible – based on currently available fuel products – to significantly reduce the GHG emissions of fuels used in BC. The 2014 BC-LCFS review results and follow-on letters from the Minister to industry sectors in 2016, established that the BC-LCFS regulatory requirements to 2020 can be met by obligated parties and that the Province would maintain its regulatory structure. Over the period 2014-2017, US markets further advanced the use of low carbon fuels, including expanded use of E10, E15, E85, and biodiesel blends of B5-B20 (for example, see US RFS2<sup>8</sup> results, and California LCFS<sup>9</sup> results). As stated in the Pathway Assessment, comparable actions have not been taken by obligated parties in BC, despite clear direction to do so from the Minister and as embodied in the terms of the *Regulation*.

As set out in Appendix II, we provide an analysis of several scenarios under which feasibility of the BC-LCFS to 2020 can be achieved.

Lower carbon fuel suppliers have invested capital and expertise to commission new fuel production facilities and build new supply chains to meet growing demand in the province. Any relaxation of the BC-LCFS may materially harm capital investments made to date in response to the BC-LCFS. Relaxing the *Regulation* would negatively reinforce the ‘policy risks’ attendant to government regulation of fuel markets and impair financing and buildout of new low carbon fuel supplies to 2030 and beyond.

2. Employ, as necessary, the non-compliance provisions in the Regulation

*Discussion:* Non-compliance provisions are in place to encourage adherence to regulations and should prevent parties from realizing an economic benefit from non-compliance. Examples of these principles are found in the enforcement provisions of the California LCFS regulations<sup>10</sup>, and in ON’s proposed administrative penalties under the *Climate Change Mitigation and Low-carbon Economy Act*<sup>11</sup>.

Based on the current value of BC-LCFS credit values, the \$200/credit BC-LCFS Part 3 penalty level is at a reasonable level to motivate adherence with the *Regulation* (note - it is also reasonably comparable to credits values of US RFS2 RINs and CA LCFS credits).

The enforcement provisions of the BC-LCFS should be adhered to, to ensure that all parties are treated equitably for actions taken / not taken under the BC-LCFS.

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<sup>8</sup> US EPA RFS2 Results: <https://www.epa.gov/renewable-fuel-standard-program/renewable-identification-number-rin-data-renewable-fuel-standard>

<sup>9</sup> CA LCFS Results: <https://www.arb.ca.gov/fuels/lcfs/lcfs.htm>

<sup>10</sup> CA LCFS Enforcement: <https://www.arb.ca.gov/fuels/lcfs/enforcement/enforcement.htm>

<sup>11</sup> ON CCMLCEA Penalties: <http://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTMzOTI4&statusId=MjAzNzEx&language=en>

### **Low Carbon Fuel Standard – 2030**

3. Establish a 2030 carbon intensity reduction level of 15-20%, and a progressively stringent reduction schedule over the 2020 – 2030 period. Establish the carbon intensity reduction requirements based on a review of market evidence, life cycle carbon intensity modeling, and compliance scenario modeling of future amendments to the regulation to 2030

*Discussion:* It is beyond the scope of this submission to elaborate on all components of the analysis to determine the 2030 target reduction level for the BC-LCFS and the carbon intensity reduction schedule between 2020 – 2030. We anticipate that this current BC-LCFS review process will conduct the requisite analysis to establish appropriate carbon intensity reduction requirements based on:

- a. Market-based evidence of low carbon fuel supply and use in North America (e.g. evidence-based review of the Pathway Assessment and BC fuel markets);
- b. Analysis of the life cycle carbon intensity of fuels available to the BC market using GHGenius 4.03 or later;
- c. Incorporation of proposed/possible amendments to the BC-LCFS in compliance scenario modeling (see Appendix III); and
- d. Consideration of emerging technologies and potential lower carbon fuel products and innovations (e.g. biocrude, advanced biofuels)

Further, we recommend finalizing amendments to the 2030 BC-LCFS in 2018/2019, in order for market participants to plan accordingly. Given the scope and scale of investments and business strategies required to decarbonize transport fuels, it is important to set a long-term policy commitment signal well in advance of the regulatory horizon (i.e. follow approach taken in 2008 to set the BC-LCFS requirements to 2020).

### **Renewable Fuel Use**

4. Increase the renewable fuel volumetric requirements in regular unleaded gasoline fuel to 10% and in diesel fuels to 5%, by 2020

*Discussion:* As demonstrated by BC-LCFS results to date<sup>12</sup>, decarbonization of transport fuels through increased use of low carbon biofuels is a highly effective emissions mitigation strategy. Early compliance with federal, state, or provincial renewable fuel standard (RFS) blending requirements enabled rapid adoption and credit banking through low carbon biofuels use in the low carbon markets in the US and Canada (CA, BC, OR). Modestly expanding the RFS component of the BC-LCFS to ‘best-practice’ levels in Canada will create a level market ‘floor’ structure which lowers overall market costs for suppliers and consumers. The commensurate expansion in infrastructure and fuel supply options provides a stronger platform on which individual market participants can choose BC-LCFS compliance strategies.

In addition, BC’s canola and livestock farmers and rendering operations are supplying the growing market for advanced biofuels in North America. Increasing the use of renewable fuels (biodiesel, renewable hydrocarbon diesel, ethanol) in the province will enhance the economic potential of advanced biofuels, and help attract investments to regionally produce advanced biofuels.

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<sup>12</sup> BC LCFS Regulation Summary (Sep-17): *ibid*

We recommend modestly increasing renewable fuel use to 10% in regular unleaded gasoline and 5% in distillate fuels to match current regulatory proposals in Ontario<sup>13</sup> and Manitoba<sup>14</sup>, respectively. Both of these blend levels are within technical limits and, in the case of distillate fuel blending, have already been achieved in BC. Increased RFS blending requirements should be counted towards compliance with the carbon intensity reduction requirements of the BC-LCFS.

5. Continue to support the increased use of mid- and high-level blends of low carbon biofuels (ethanol and biodiesel) and cold weather use of biodiesel through Part 3 Agreements under the BC-LCFS

*Discussion:* We support the Ministry's initiative and encourage the Province to continue measures to expand use of mid- to high-level blends of biodiesel (B10+) and ethanol (E15+), and cold weather use of biodiesel, through Part 3 Agreements.<sup>15</sup> There are three primary reasons: (1) mid- to high-level biofuel blend use and winter biodiesel use will generate compliance credits which are a key flexibility mechanism for obligated parties under the BC-LCFS; (2) opening new markets (and credit entitlement) for higher biofuel blend options expands fuel choice for consumers, and enhances market competition; and (3) significant greenhouse gas reductions will be realized from expanded use of low carbon biofuels.

US markets have demonstrated how to effectively penetrate gasoline and diesel markets with E15, E85 and B6-20 fuels through the use of compliance credits (RINs, LCFS credits). In certain markets, these are enhanced with supportive fiscal policies (e.g. fuel tax exemptions, infrastructure grants). Given the importance of low carbon biofuels to meeting climate mitigation targets, Part 3 Agreements are an important complementary measure to include in the BC-LCFS structure, and will attract new clean innovation capital investment in the province.

We recommend expanding eligibility to earn Part 3 Agreement credits to independent parties in order to expand investment, increase the supply of fuel options, and improve competitiveness of the BC transport fuel market.

### **Carbon Pricing**

6. Exempt biofuels from the BC carbon tax on fuel use

*Discussion:* To date, carbon pricing systems in Canada have failed to create a market price signal based on the GHG emissions of fuels used in Canada. In BC<sup>16</sup> and AB<sup>17</sup>, the carbon tax applies equally (at the same rate) to low carbon fuels and high carbon fossil fuels. Fuel tax systems have also failed to reflect different energy densities of low carbon ethanol and biodiesel fuels, which has created a 'surtax' on low carbon biofuels use by applying excise and carbon taxes on a volumetric basis. As a result, the BC carbon and excise tax structures subsidize the use of high carbon fossil fuels in BC.

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<sup>13</sup> ON Gasoline RFS Increase: <https://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTM0MDQ3&statusId=MjAzOTE4&language=en>

<sup>14</sup> MB *Climate & Green Plan* – Diesel RFS Increase: <https://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTM0MDQ3&statusId=MjAzOTE4&language=en>

<sup>15</sup> BC Part 3 Agreement: [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/transportation/renewable-low-carbon-fuels/part\\_3\\_agreements\\_2017-18.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/transportation/renewable-low-carbon-fuels/part_3_agreements_2017-18.pdf)

<sup>16</sup> BC Carbon Tax Rates: <http://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/mft-ct-005-tax-rates-fuels.pdf>

<sup>17</sup> AB Carbon Levy Rates: [http://www.finance.alberta.ca/publications/tax\\_rebates/rates/carbon-levy-rates.html](http://www.finance.alberta.ca/publications/tax_rebates/rates/carbon-levy-rates.html)

Exempting biofuels from the carbon tax in BC would redress the current tax structure failures that impair adoption of low carbon biofuels. Further, a carbon tax exemption for biofuels would align with: (i) the federal approach under the proposed federal Carbon Pricing Backstop<sup>18</sup>; (ii) the cap & trade program design in ON<sup>19</sup> and QC<sup>20</sup>; and (iii) the AB<sup>21</sup> carbon levy exemption on biofuels in fuels blends above E10 and B5. We support the full review under the Pan-Canadian Framework on Clean Growth and Climate Change<sup>22</sup> of carbon pricing (and excise fuel taxation) systems in 2020 / 2022 to correct design flaws and improve tax efficacy at a national level, but urge BC to act now to correct the carbon tax design flaws before carbon tax levels are increased and further exacerbate negative market impacts.

7. Adopt an Output-Based Pricing (OBP) system comparable to the Alberta and the federal carbon pricing backstop schemes to ensure competitiveness of emissions intense – trade exposed (EITE) biomass processing and advanced biofuels production facilities in the province

*Discussion:* Canola crushing, rendering, forestry mills, and advanced biofuels production facilities can consume significant quantities of natural gas for process heat. As these operations are ‘emissions intense – trade exposed’ (EITE) and must compete with competitor facilities in the US and neighbouring provinces, the application of the BC carbon tax on process fuels negatively impacts market competitiveness unless and until comparable carbon prices are applied in these jurisdictions.

Output-Based Pricing (OBP) systems relieve industrial operations from the application of the carbon tax by introducing a performance-based carbon pricing system that applies to emissions above ‘best-in-class’ or benchmarked emission levels. These systems consider the extent of EITE exposure to reflect benchmark levels and mitigate trade impacts of carbon pricing. AB recently announced the terms of their OBP system under the *Carbon Competitiveness Incentive Regulation*<sup>23</sup>, which enables trade exposed biomass or advanced biofuel operations to ‘opt-in’ to the regulation.

The province should adopt an OBP system designed to protect the trade competitiveness of BC’s agricultural and forestry processing sectors and attract investment in the production of advanced biofuels, while maintaining the incentive to reduce process energy use and greenhouse gas emissions. Ensuring eligibility in the OBP system, and setting appropriate benchmarks and ramp rates for BC-based industrial facilities, will ensure a ‘level playing field’ for industrial processing facilities in the province.

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<sup>18</sup> Government of Canada: *Federal Carbon Pricing Backstop*

<https://www.canada.ca/en/services/environment/weather/climatechange/technical-paper-federal-carbon-pricing-backstop.html>

<sup>19</sup> ON: *Guideline for Quantification, Reporting and Verification for GHG Emissions, Appendix 25*

[https://files.ontario.ca/guideline\\_for\\_quantification\\_reporting\\_and\\_verification\\_of\\_greenhouse\\_gas\\_emissions\\_2\\_017.pdf](https://files.ontario.ca/guideline_for_quantification_reporting_and_verification_of_greenhouse_gas_emissions_2_017.pdf)

<sup>20</sup> QC *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances*. Section 2(2)(3):

<http://legisquebec.gouv.qc.ca/en/ShowDoc/cr/Q-2,%20r.%2046.1>

<sup>21</sup> AB *Climate Leadership Regulation*. Section 2(2):

[http://www.qp.alberta.ca/1266.cfm?page=2016\\_175.cfm&leg\\_type=Regs&isbncIn=9780779793792&display=html](http://www.qp.alberta.ca/1266.cfm?page=2016_175.cfm&leg_type=Regs&isbncIn=9780779793792&display=html)

<sup>22</sup> Governments of Canada: *Pan-Canadian Framework on Clean Growth and Climate Change*. Accessed at:

<https://www.canada.ca/content/dam/themes/environment/documents/weather1/20170125-en.pdf>

<sup>23</sup> AB *Climate Competitiveness Incentive Regulation*: <https://www.alberta.ca/carbon-competitiveness-incentive-regulation.aspx>

### ***Clean Transportation Investment***

8. Ensure transportation carbon revenues are ‘recycled’ (or re-invested) to specifically support transport sector decarbonization, including the production and use of low carbon fuels (advanced biofuels, electric vehicles, alternative fuels)

*Discussion:* Carbon pricing measures implemented in BC, AB, ON and QC are budgeted to realize \$4.6 billion in fiscal year 2017-18; these funds will grow significantly as the scope and stringency of carbon pricing increases in the future. Canadian governments are actively designing and deploying programs to allocate these revenues across a range of priorities: support for households and trade exposed sectors, climate mitigation actions, and climate adaptation priorities. While carbon revenues and reinvestment programs are relatively new, North American and global markets have more extensive experience in building out the supply and use of low carbon fuels through a mix of regulatory measures, and complementary fiscal and regulatory policies.

We encourage BC, and all governments in Canada, to collaborate with industry, other governments, and stakeholders to develop and implement a national ‘Clean Fuels Strategy’ to expand the production and use of low carbon fuels. A national ‘Clean Fuels Strategy’ would bring together private and public-sector capital, innovation, and human resources to ensure Canada captures the economic benefits from the transition to lower carbon transport fuels. Specifically, governments must dedicate carbon revenues on transport fuels to be re-invested in decarbonizing transportation systems.

Given the province’s unique natural resources, capturing the economic growth inherent in the transition to a cleaner, low carbon economy will require a strategic, focused approach in British Columbia. For example, BC’s large-scale production of sustainable forestry biomass and clean electricity, are strategic resources that should be leveraged to expand the production of low carbon fuels in the province.

The Province’s decision to set aside carbon tax revenues to invest in climate action priorities allows the province to establish programs that fit BC’s natural resources and are competitive with other carbon revenue investment programs in Canada (e.g. AB, ON, QC). We recommend the Province establish a clear ‘transportation focus’ within an expanded Innovative and Clean Energy (ICE) Fund, including: the production and use of low carbon fuels (EVs, alternative and renewable fuels), fuel efficiency and fleet conversion, and active mobility and public transportation.

## Appendix II: BC-LCFS Pathways Assessment & 2020 Modeling Scenarios

### **Pathway Assessment**

**Overview** The Pathway Assessment is a valuable compilation of data and analysis on market barriers and technical points relating to transportation fuels that have been under consideration by Canadian governments and stakeholders for over a decade. In general, we believe the Pathway Assessment document fairly reflects the 2017 status of BC fuel markets and compliance issues and opportunities with respect to the BC-LCFS. [We note that the historical chronology omits reference to multiple pre-regulation stakeholder reviews of the BC-LCFS, and the delay in implementation of the BC-LCFS carbon intensity provisions from 2010 to July 2013; this relaxation was specifically granted to provide time for obligated parties to ready their fuel supply operations for the subsequent periods.]

There are specific elements of the analysis that warrant an update to the information source, or require technical correction; these will follow in due course. Our comments below reflect principles and data gaps that will assist all parties in completing the current review of the BC-LCFS.

**BC-LCFS Review** The 2014 BC-LCFS review established a key process principle that assisted with the stakeholder review; we recommend reiterating and establishing clarity on this at the outset of this review:

- a. Evidentiary Process and Peer Review – parties should be required to back market or technical claims with supporting evidence. All submissions should be ‘public domain’ within the stakeholder group, and time provided to allow for an expert peer review by stakeholders. Claims that are not supported by evidence or countered by contrary, higher quality data, should be withdrawn or ruled as ‘resolved’.

In addition, a key tenet of the BC-LCFS related to individual fuels or technologies is as follows:

- b. Feedstock / Technology Agnostic – the BC-LCFS is agnostic or neutral with respect to lower carbon fuel options – be they related to feedstock, technology, or market of origin. The metric measured and regulated is the life cycle carbon intensity of the fuel. As such, while parties may wish to advocate for the future potential of a particular fuel, that is not the focus of either the regulation, or the BC-LCFS review. That said, we do need to consider how to ensure emerging lower carbon fuels (e.g. refinery improvements, co-processing of biocrude, novel fuels) are impacted by the BC-LCFS regulatory design.

As stated in the Pathway Assessment, ‘all lower carbon fuel options’ are needed to decarbonize transport fuel emissions. The climate problem is larger than currently available solutions. In this regard, we support a general approach to the BC-LCFS review that focuses on outcomes:

- c. Results Based – the BC-LCFS review should look to identify actions or regulatory measures that will lead to decarbonization of transport fuels and mitigate economic impacts. New opportunities should be ‘enabled’ by the BC-LCFS to gain market access, and accretive to current market practices. Progressive stringency rewards early action and will ensure use of lower carbon fuels expands over time, and that investment in innovation and low carbon fuel production continues to grow.

*BC-LCFS Fuel Market Issues* The Pathway Assessment explores several topics in Section 2 related to fuel market issues. To assist the review of these, and claims related to them in response to the Pathway Assessment, we recommend the following approach:

- a. **Comparable Efforts** – in 2017, we now have considerably richer detail of fuel markets and low carbon strategies, as evidenced by actions and results in other markets. A fundamental ‘lens’ through which to view the BC fuel market and BC-LCFS review is whether fuel suppliers have made ‘comparable efforts’ to those of their parent company or peer companies in these other low carbon fuel markets (e.g. CA, MN, IO, IL, US). “If not, why not?” is a question we need answered.
- b. **Fuel Quality Incidents** – a number of issues reviewed pertain to fuel quality issues (OEM warranties, misfueling, fuel infrastructure). In the 2014 BC-LCFS review, no evidence was presented with respect to the number, nature, and resolution of actual cases related to fuel quality incidents (in BC, or elsewhere). In contrast, we have rapid expansion of low carbon biofuel use in the US, with proper management of fuel quality across the supply chain. If fuel suppliers seek to re-visit these concerns, we ask that they provide evidence to substantiate their claims.
- c. **Fuel Markets** – as noted in the Pathway Assessment, there is ample market evidence to support the viability of the BC fuel supply system to support greater use of low carbon biofuels. The data on the ‘state of North American fuel markets’ with respect to biofuel blend options, fuel pricing, market adoption, low carbon fuel supply, and market concentration provides good evidence as to the viability of higher use of low carbon biofuels in comparable markets and climatic conditions to BC. In BC, fuel suppliers have significant ‘market control’ to price and supply fuel options from the terminal rack to the retail pump or depot. Any claims related to market barriers will require evidence that comparable efforts have been made to ‘ground truth’ the assertion (e.g. have E85 or B20 fuels been competitively priced and supplied to markets to meet BC-LCFS compliance obligations?).

*BC-LCFS Compliance Scenario* The compliance scenario presented in the Pathway Assessment represents a fairly modest effort with respect to 2020 and 2030 fuel use. We recommend the BC-LCFS review a range of scenarios to consider:

- a. **Base Case** – a scenario that incorporates currently available fuels, trend line carbon intensities, and trend line adoption of vehicle platforms
- b. **Market Transition Case** – a scenario that builds on the Base Case to consider a gradual shift to higher use of emerging fuels and technologies, and greater adoption of ZEVs, modal shifts, etc. The modeling rates for different fuels should reflect mature options, and evidence from adoption in other markets.
- c. **Market Transformation Case** – this scenario can incorporate more aggressive market transitions through technology innovations, policy support, and a more stringent BC-LCFS regulatory structure

As noted previously in this submission, we support retaining the terms of the existing BC-LCFS regulatory structure, and maintaining a progressively stringent carbon intensity reduction requirement to 2030. Modeling of BC-LCFS compliance scenarios should incorporate these aspects, and other modifications to regulation as a result of the current review (see Appendix III).

Our modeling of the BC-LCFS to 2020 is presented below.

## 2020 Modeling Scenarios

**Introduction:** Based on scenario modeling from the Pathway Assessment, we examined a scenario for meeting the 2020 reduction target without the use of banked credits. That target scenario, alongside the 2016 compliance figures, the ‘BC Pathway version’, and a ‘moderate’ scenario are presented below. Meeting the 2020 target without the use of banked credits (the ‘Hit 10% target’ scenario) would allow these credits to be carried forward and applied to future years when the BC-LCFS becomes more stringent.

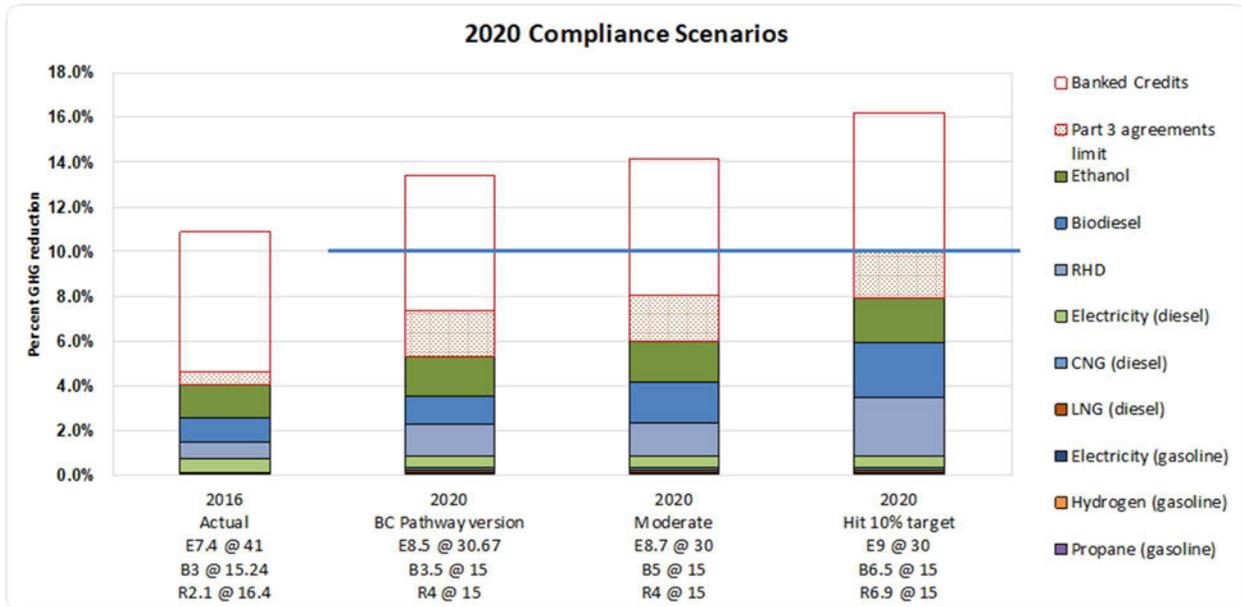


Figure 1: 2016 (actual) and 2020 projected compliance scenarios.

**Discussion:** Building on the model scenario in the Pathway Assessment, which is considered a ‘modest’ compliance effort, we increased only biofuel use gradually until compliance was met without the use of credits in 2020. The ‘Moderate’ scenario version increases ethanol use by 0.2% and biodiesel use by 1.5% in 2020 from the Pathway version. The ‘Hit 10% target’ scenario version is reached with a moderate increase in low CI (30 g/MJ) ethanol use, and more significant increases in both biodiesel and renewable hydrocarbon diesel (RHD or R) at currently reported carbon intensities (15 g/MJ). Low carbon intensity ethanol from wheat feedstock is currently produced in western Canada and readily available to the BC market. There are many large industrial fleets in BC that could operate on biodiesel blends up to B20, which allows for a significant increase in biodiesel consumption. As already demonstrated in the BC market, higher use of RHD fuels in diesel fuel supplies are feasible without infrastructure adjustments.

The carry-forward of banked credits from 2020 will facilitate the ramp-up of the BC-LCFS to 2030, and allow firms more flexibility as they prepare to comply with a 15-20% BC-LCFS carbon intensity reduction target.

The table below provides a more detailed breakout of the fuels incorporated into the foregoing modeling.

Table A: Modeling assumptions, fuel volumes and carbon intensities for 2016 and 2020 compliance scenarios.

	2016 Actual	2020 BC Pathway	2020 Moderate	2020 Hit 10% target
Ethanol CI	41	31	30	30
Ethanol %	7.4%	8.5%	8.7%	9.0%
Ethanol (litres)	375,142,440	408,683,396	423,399,650	435,923,370
Biodiesel CI	15	15	15	15
Biodiesel %	3.0%	3.5%	5.0%	6.5%
Biodiesel (litres)	105,404,839	135,186,101	194,820,925	253,382,931
RHD CI	16	15	15	15
RHD %	2.1%	4.0%	4.0%	6.9%
RHD (litres)	73,318,230	155,305,512	155,305,512	269,000,000
CNG # HDV	320	1,016	1,016	1,016
LNG # HDV	125	125	125	125
Electric # LDV	4,167	15,007	15,007	15,007
Hydrogen # LDV		438	438	438

## Appendix III: BC-LCFS Amendments

### **BC-LCFS Policy Improvements – Identified Measures**

#### **a. Cost-Containment Market Mechanism**

*Recommendation:* Adopt a Credit Clearance Market (CCM) mechanism to mitigate potential BC-LCFS costs impacts, accelerate credit generation, and incentivize clean fuel development and production.

*Discussion:* Administrative penalties in the BC-LCFS, even though intended to reflect the cost of non-compliance, do not further the overall goal of the BC-LCFS: to use the market to reward low carbon fuel providers.

California and Oregon have each studied a range of approaches to cost containment, and both have selected a CCM mechanism. Both jurisdictions have also acknowledged that a CCM has complementary benefits, which strengthen the case for its adoption. Clean fuel producers and distributors recognize the intrinsic ‘incentive value’ potential under a CCM mechanism. Adoption of a CCM for the BC-LCFS would require minimal resources and time for review and development.

#### **b. Refinery Improvements**

*Recommendation:* Amend the BC-LCFS to enable limited refinery-based emissions reduction activities to be eligible for credit generation.

*Discussion:* The CA LCFS enables credit generation for specific refinery-based activities or projects that reduce petroleum refinery GHG emissions. Amongst the activities approved are: the use of renewable hydrogen, carbon capture and storage, process fuel switching, and electrification. The complex nature of refinery operations necessitates specific measurement and project protocols to isolate the GHG impact of reduction activities against the overall refinery GHG profile. Project approval by the regulator in CA is subject to minimum reduction thresholds (e.g. 0.1 gm CO<sub>2</sub>e/MJ of diesel or RUL gasoline). Additionally, credit generation is capped at 20% of a refiner’s annual obligation (deficits), and the activity/project credits cannot be exchanged in the credit market (i.e. used only towards refiner’s own obligation).

Enabling limited refinery credit generation should be considered in the review, but their scope and magnitude of use must be determined in the context of the overall BC-LCFS.

#### **c. Co-processing**

*Recommendation:* Enable credit generation from co-processing of biogenic feedstocks at a petroleum refinery.

*Discussion:* Oregon and California, as well as Canada’s federal RFS, enable credit generation from the co-processing of biogenic feedstocks in petroleum refineries. Co-processing offers the potential for utilization of existing refinery capacity to achieve carbon intensity reductions in transport fuels. The methodology to establish accounting for renewable content and/or carbon intensity reductions

that result from different co-processing technologies requires a technical assessment of the process, and an apportionment of biogenic/carbon reduction attributes to the finished gasoline and diesel fuels, and other refinery co-products and residuals.

The BC-LCFS review should consider co-processing options, and whether uncertainties can be addressed using limitations on scale, exchange of credits, or other mechanisms.

**d. Low Carbon Aviation – Marine – Locomotive Fuels**

*Recommendation:* Enable limited credit generation from use of lower carbon fuels in aviation, marine, and rail transportation.

*Discussion:* Fuels used in inter-provincial and international transportation sectors are often not included in regulatory frameworks. However, GHG emissions reductions from these sectors are growing rapidly and need to be addressed. International UN bodies are advancing protocols to reduce GHG emissions in aviation<sup>24</sup> and marine<sup>25</sup> transport; these protocols will support increased use of renewable, low carbon fuels.

Technologies, such as renewable hydrocarbon diesel, biomass co-processing, and alcohol to jet fuels, are viable commercial solutions that are functional in both road and non-road transport systems. Adopting mechanisms to incorporate a limited number of credits into the BC-LCFS framework will encourage the production and use of these fuels in the province, and help mitigate GHG emissions in all sectors. Expanding the supply of eligible fuels will expand credit generation, increase flexibility, and allow for greater stringency of the BC-LCFS.

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<sup>24</sup> ICAO Alternative Fuels: <https://www.icao.int/environmental-protection/GFAAF/Pages/default.aspx>

<sup>25</sup> IMO Low Carbon Shipping: <http://www.imo.org/en/mediacentre/hottopics/ghg/pages/default.aspx>