

# B.C. Low Carbon Fuel Standard: General Amendments Discussion Paper

---

July 5, 2019

1	Introduction .....	1
2	Background .....	2
3	Amendments .....	2
	3.1 Point of Compliance .....	2
	3.1.1 Electricity.....	3
	3.1.2 Propane .....	3
	3.1.3 Compressed Natural Gas .....	3
	3.1.4 Hydrogen .....	3
	3.1.5 Liquefied Natural Gas.....	3
	3.2 Energy Effectiveness Ratio (EER) .....	4
	3.3 New Fuel Classes .....	4
	3.4 Small Supplier Exemption.....	5
	3.5 Part 3 Agreement Eligibility.....	5
	Appendix A. Proposed Energy Effectiveness Ratios.....	7
	Appendix B. References .....	7

## 1 Introduction

The *Greenhouse Gas Reduction (Renewable and Low Carbon Fuel Requirements) Act* (Act) and the *Renewable and Low Carbon Fuel Requirements Regulation* (Regulation) are known collectively as the B.C. Low Carbon Fuel Standard (BC-LCFS). The Ministry of Energy, Mines and Petroleum Resources (Ministry) is considering amendments to the BC-LCFS.

The purpose of this paper is to discuss potential amendments regarding emerging fuels, new fuel classes, the energy effectiveness ratio (EER), the small supplier exemption, and Part 3 Agreement eligibility. These amendments are expected to enhance the BC-LCFS by providing updates to background data, improved clarity, and increased participation in Part 3 Agreements.

The Ministry is seeking feedback on these potential changes. Responses must be in writing and must be submitted by email or mail before 4 p.m. on August 16, 2019 to one of the following addresses:

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

Mail: Low Carbon Fuels Branch  
B.C. Ministry of Energy, Mines, and  
Petroleum Resources  
P.O. Box 9380 Stn Prov Govt  
Victoria, B.C. V8W 9M6

This discussion paper and a response form for public and stakeholder comment can be accessed on the Ministry's website at:  
<https://gov.bc.ca/lowcarbonfuels>.

The Ministry is concurrently releasing two additional discussion papers:

- 1) A discussion paper regarding potential mechanisms to credit greenhouse gas emissions improvements for fuels produced at fossil-fuel refineries.
- 2) A discussion paper regarding a possible compliance assurance mechanism.

## 2 Background

Under the BC-LCFS policy, fuel suppliers must progressively decrease the average carbon intensity of their fuels to achieve a 10% reduction in 2020 and 20% reduction in 2030. The carbon intensity of a fuel represents the greenhouse gas emissions associated with its production and use as determined by a lifecycle assessment, presented in terms of grams of carbon dioxide equivalent per mega joule (gCO<sub>2</sub>eq/MJ) of the produced fuel. A lifecycle assessment considers the emissions associated with each stage of a fuel product's life and all materials and energy used from feedstock production or acquisition through fuel use.

A fuel supplier generates credits by supplying fuel with a carbon intensity below the prescribed target, and they incur debits by supplying fuel with a carbon intensity above the target (e.g. petroleum-based gasoline and diesel). To remain compliant, a fuel supplier must ensure that debits incurred from supplying higher carbon fuels are offset by credits generated from supplying lower carbon fuels. A fuel supplier can bank surplus credits if they over-comply with the carbon intensity target in a given year; they can also purchase credits from other fuel suppliers.

The Ministry has identified several areas of the BC-LCFS that would benefit from clarification, updates and expansion, and is considering amendments that would incorporate these changes.

## 3 Amendments

### 3.1 Point of Compliance

Gasoline, diesel, and their liquid renewable substitutes such as ethanol and biodiesel, were the predominant transportation fuels when the BC-LCFS came into effect in 2010. Today, additional fuels are being used for transportation, such as electricity, natural gas, propane, and hydrogen. These fuels are different from traditional liquid fuels in that they are not primarily used for transportation. The Ministry calls fuels that fall into this category “emerging fuels.” Emerging fuels are only Part 3 fuels if they are used in substitution for gasoline or diesel fuel.

Under the Act, a Part 3 Fuel Supplier is a person that sells or uses Part 3 fuel for the first time after it is manufactured in or brought into British Columbia. Confusion regarding the definition of “manufactured” for emerging fuels prompted the Ministry to clarify its position for these fuels in [Information Bulletin RLCF-009](#). The bulletin specifies that in addition to the traditional definition of a fuel supplier, suppliers of emerging fuels must be able to accurately quantify the amount of the emerging fuel used for transportation purposes. Because the manufacturer of the emerging fuel and the entity that can quantify the volumes used in transportation are often different, the Ministry is considering the adoption of California's approach, where the point of compliance for emerging fuels occurs when the fuel is dispensed into a transportation vehicle from the fuel supply equipment. The fuel supplier that would correspond with this point of compliance, and be eligible for generating credits from fuel supply, is described below for each type of emerging fuel.

### 3.1.1 Electricity

As described in RLCF-009, for electricity the Part 3 fuel supplier is the first person who has a reasonable belief that the electricity is used for transportation in substitution for gasoline or diesel fuel and can quantify this amount by the end of the compliance period. To reduce potential conflicts, the Ministry is considering the implementation of a protocol similar to that of California, where the point of compliance depends on the type of charging activity. The fuel suppliers are grouped into three categories:

- 1) Network Operators. These are the entities that collect data from the communication platform required to operate the electric vehicle charging station
- 2) Site Hosts. These are the entities that own, lease, or manage a charging site where charging stations are installed
- 3) Electric Utilities

The fuel supplier that the Ministry is considering for each type of charging activity are:

- For non-residential charging (i.e. charging accessible to the public), the supplier would be the Network Operator.
- For workplace or restricted access such as electric vehicle fleets or electric transit charging, the supplier would be the Site Host.
- For multi-family residential charging, the supplier would be the Site Host.
- For single-family networked and metered residential charging, the supplier would be the Network Operator.
- For single-family, non-networked/non-metered residential charging, the supplier would be the Electric Utility.

In all cases, the fuel supplier designation and rights to credit generation would fall to the electric utility if the fuel supplier listed above does not

register and report the electricity used for transportation purposes.

### 3.1.2 Propane

As described in RLCF-009, for propane the Part 3 fuel supplier is the first person who has a reasonable belief that the propane is used for transportation in substitution for gasoline or diesel fuel and can quantify this amount by the end of the compliance period. For clarity, the Ministry is considering specifying the fuel supplier as the person who owns the propane when it is dispensed for use in a vehicle.

### 3.1.3 Compressed Natural Gas

As described in RLCF-009, for compressed natural gas the Part 3 fuel supplier is the person who owns the natural gas when it is compressed for use in transportation. For clarity, the Ministry is considering specifying that the supplier is the person who owns the compressed natural gas when it is dispensed for use in a vehicle.

### 3.1.4 Hydrogen

As described in RLCF-009, for hydrogen the Part 3 fuel supplier is the person who owns the hydrogen when it is compressed or liquified for use in transportation and can accurately identify the quantity that was used in substitution for gasoline and diesel. For clarity, the Ministry is considering specifying that the fuel supplier is the person who owns the hydrogen when it is dispensed for use in a vehicle.

### 3.1.5 Liquefied Natural Gas

As described in RLCF-009, for liquefied natural gas the Part 3 fuel supplier is the person who liquefies the natural gas and can accurately identify the quantity that was used in substitution for gasoline or diesel. For clarity, the Ministry is

considering specifying that the fuel supplier is the owner of the liquified natural gas when it is dispensed for use in a vehicle.

### **3.2 Energy Effectiveness Ratio (EER)**

The energy effectiveness ratio (EER) reflects the relative efficiency of a powertrain using Part 3 fuel compared to an internal combustion engine using gasoline or diesel fuel. The EER accounts for the different efficiencies of drivetrains when determining credits or debits resulting from the use of the Part 3 fuel. However, new vehicles and powertrains are being commercialized which have significantly different EERs within a single fuel class. For example, data for electricity used in a battery electric truck (Gross vehicle weight rating > 14,000 lbs) indicates an EER of 5.0, while electricity used in light rail has an EER of 3.3 [4].

The Ministry is considering amendments to the Regulation to enable more accurate recognition of the relative efficiencies of Part 3 fuels when used in different drivetrains. This would result in several EERs being prescribed for a single Part 3 fuel, depending on its end use, allowing fuel suppliers to identify a more appropriate EER when justified.

To identify appropriate fuel classes for new drivetrains, the Ministry is considering the introduction of rules for identifying the fuel class in which a fuel belongs by identifying the end use of the fuel, including the vehicle drivetrain and/or the Gross Vehicle Weight Rating (GVWR) of the vehicle in which the fuel was used.

For example, fuels used in vehicles with a GVWR class greater than (>) 14,000 lbs would be considered diesel class, while fuels used in vehicles less than or equal to ( $\leq$ ) 14,000 lbs would be considered gasoline class. Appendix A presents the proposed amendments to the existing EERs specified in the Regulation.

The proposed GVWR thresholds and EER values were chosen to align with those in California's LCFS, with considerations for the B.C. context. In order to report a more advantageous EER, the fuel supplier must have a reasonable expectation that the fuel will be used in the relevant drivetrain. If no evidence is available or provided, the most conservative (lowest) EER would be used by default.

### **3.3 New Fuel Classes**

Aviation and marine transportation account for 28% of worldwide transportation emissions and those emissions are expected to increase as goods and passenger transportation grow [1] [2]. Marine transportation alone is projected to increase by 50% - 250% by 2050 [1] while aviation may increase by as much as 360% [3].

Production capacity for low carbon alternative fuels in these sectors is beginning to be developed, but in most cases the costs are relatively high, and development is slow, due to the need for caution in testing and certifying the fuels for use.

The Act does not currently recognize GHG reductions within the aviation and marine fuel sectors, so the Ministry is considering whether to expand the BC-LCFS to include these reductions and provide support for low carbon fuel development by adding two additional fuel classes: jet fuel class and marine fuel class.

The Ministry is considering whether the jet and marine fuel classes should be regulated similarly to the diesel and gasoline fuel classes, resulting in increased obligations for all suppliers; or by allowing all suppliers to opt-in, where only low carbon fuels could be reported without adding compliance obligations. Allowing jet and marine fuel suppliers to obtain credits for the alternative fuels they develop without accruing debits could help bridge the price gap of alternative fuel production in these industries, provide the needed

support to develop fuel quality standards in the near-term, and support new markets. California has taken the opt-in approach for jet fuels within their LCFS but does not currently include a marine fuel class [4].

In addition, the Ministry must decide whether the new jet and marine fuel classes would apply only to fuel used in aircraft or vessels within the province or whether fuel supplied to aircraft or vessels that travel outside of the province would also be included. The BC-LCFS currently covers fuels that are supplied within the province, with the expectation that these fuels would also be used within the province, except for the small amount of fuel that may leave the province in a vehicle's fuel tank. However, fuel tanks of ocean vessels and aircraft are large, so the fuel combustion and emissions occur predominantly outside of the province for most vessels and aircraft travelling internationally. California allows the emission reductions of international flights to be recognized within their LCFS, essentially recognizing all low carbon fuels supplied to aircraft in California. California also recognizes diesel and electricity that are supplied to harbour craft operating within California state boundaries but does not recognize fuels supplied to international ocean vessels, other than shore-power electricity supplied at berth [4].

### **3.4 Small Supplier Exemption**

Under the current Regulation, suppliers are exempt from the requirements for a compliance period if they supply less than 75 million liters of Part 2 fuels within the compliance period.

The Ministry has received letters from fuel suppliers asserting that in recent months, other fuel suppliers claiming exemption have increased the quantities of fuels imported into B.C. in order to avoid higher B.C. wholesale prices. If this trend continues, increasing quantities of exempt fuel will enter the Province, reducing the effectiveness of the BC-LCFS and allowing small suppliers to

compete unfairly with larger suppliers who are complying with the Regulation. In order to fulfil the intent of the BC-LCFS and maintain the competitiveness of suppliers within B.C., the Ministry is considering a reduction of the exemption limit.

Reducing the exemption limit could impact small suppliers who import fuel by subjecting them to the Regulation. To enable these suppliers to comply with the BC-LCFS, the Ministry is considering measures that would allow small importers to negotiate with their suppliers who will comply for the fuel in question.

### **3.5 Part 3 Agreement Eligibility**

As the carbon intensity limits prescribed within the BC-LCFS become more stringent, more compliance credits will be needed to satisfy the increasing low carbon fuel demand. Part 3 Agreements provide support for projects that increase the supply of low carbon fuels, increasing the amount of credits in the market: directly through the agreement in the short term, and indirectly through the supply of more low carbon fuel in the long term. Currently, only Part 3 fuel suppliers are eligible to enter into Part 3 Agreements.

In order to increase the quantity of low carbon fuels and long-term credit opportunities, the Ministry is considering broadening Part 3 Agreement eligibility to include any proponents who participate in the fuel supply chain from feedstock to retail sale. All Part 3 Agreements would be expected to meet the same criteria, but the amendments would enable the Ministry to enter into Part 3 Agreements with:

- proponents who would become Part 3 fuel suppliers upon completion of the Part 3 Agreement;
- proponents who would produce feedstocks for conversion into fuels, such as those who

produce fuel intermediates or fuel feedstocks;  
and

- proponents who supply fuel directly to the consumer, such as retailers of high concentration biofuels.

## Appendix A. Proposed Energy Effectiveness Ratios

Fuel	Conversion method	Weight class or other restriction	Class	EER
Gasoline	Internal Combustion	none	Gasoline	1.0
Diesel	Internal Combustion	none	Diesel	1.0
CNG	Internal Combustion	GVWR $\leq$ 14,000 lbs	Gasoline	1.0
CNG	Internal Combustion	GVWR $>$ 14,000 lbs	Diesel	0.9
Electricity	Battery	GVWR $>$ 14,000 lbs	Diesel	5.0
Electricity	Battery	GVWR $\leq$ 14,000 lbs	Gasoline	3.4
Electricity	Fixed guideway	Light Rail	Diesel	2.6
Electricity	Battery	Marine Vessel	Marine	2.6
Hydrogen	Fuel Cell	GVWR $>$ 14,000 lbs	Diesel	1.9
Hydrogen	Fuel Cell	GVWR $\leq$ 14,000 lbs	Gasoline	2.5
Hydrogen	Internal Combustion	GVWR $>$ 14,000 lbs	Diesel	0.9
Propane	Internal Combustion	GVWR $\leq$ 14,000 lbs	Gasoline	1.0
LNG	Internal Combustion	GVWR $>$ 14,000 lbs	Diesel	1.0

\*GVWR = Gross Vehicle Weight Rating

## Appendix B. References

- [1] International Maritime Organization, "Third IMO GHG Study 2014: Executive Summary and Final Report," 2014. [Online]. Available: <http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Documents/Third%20Greenhouse%20Gas%20Study/GHG3%20Executive%20Summary%20and%20Report.pdf>, 2019. [Accessed: March 29, 2019].
- [2] Air Transport Action Group, [Online]. Available: <https://www.atag.org/facts-figures.html>. [Accessed January 14, 2019].
- [3] International Civil Aviation Organization, "ICAO Environmental Report 2016: Aviation and Climate Change," 2016. [Online]. Available: <https://www.icao.int/environmental-protection/Documents/ICAO%20Environmental%20Report%202016.pdf>. [Accessed March 29, 2019].
- [4] California Air Resources Board, *Fuels Subject to Regulation*, "Low Carbon Fuel Standard," 17 C.C.R. § 95482.