Technical Guideline: Cleaner Transportation Fuels

2023 Version 3.0

ONTARIO MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS

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1. Introduction

On November 25, 2020, O. Reg. 535/05 (Greener Gasoline – Bio-based Content Requirements for Gasoline) and O. Reg. 97/14 (Greener Diesel – Renewable Fuel Content Requirements for Petroleum Diesel Fuel) were revoked and a single regulation O. Reg. 663/20 (Cleaner Transportation Fuels - Renewable Content Requirements for Petroleum Gasoline and Diesel Fuels) was created to replace those regulations while maintaining separate renewable content requirements for gasoline and diesel.

On November 25, 2020, O. Reg. 663/20 ("Cleaner Transportation Fuels" or "the Regulation") came into effect. This Guideline is incorporated by reference into the Regulation. Where the Regulation requires certain information to be provided in accordance with the Guideline, that information is set out herein.

This Guideline replaces *Technical Guideline: Cleaner Transportation Fuels* (2021 v1.1).

This Guideline is divided into three parts:

- **Part A: Calculating the Greenhouse Gas (GHG) Intensity of Bio-Based Content,** which sets out:
  - The method that is required to be used to calculate GHG intensity for the purposes of Schedule 1 of the Regulation
  - Where the method of calculation of GHG intensity involves the use of a model, any modifications to the manner in which fuel suppliers must enter data into the model
  - Alternate methodologies to calculate GHG intensities
- **Part B: Compliance Equation Values**, which sets out the values to be used for equations in Schedule 1 of the Regulation
- **Part C: Quality Standards for Fuels**, which sets out the quality standards and specifications required to be met for all fuels distributed as required by section 6 of the Regulation.

2. Definitions

"Director" means the Director appointed for the regulation or a specific section of the Regulation pursuant to s.5 of the EPA.

"Fuel Pathway" means the total modelled emissions calculated by accounting for each lifecycle phase of the production and use of a specific renewable fuel made from a specific feedstock, using a specific fuel production process and distribution method.

"Regulation" means Cleaner Transportation Fuels Regulation (O. Reg. 663/20)

3. Part A: Calculating the GHG Intensity of Bio-Based Content

3.1 GHG Lifecycle Model, Version and New Facilities

Where Schedule 1 of the Regulation requires that a fuel supplier calculate the GHG intensity of particular bio-based content, the fuel supplier shall use the GHGenius model version 4.03a or 4.03b or 4.03c (collectively "GHGenius") with the required settings, inputs and outputs listed in this Part.

GHGenius 4.03c is available upon email request from Environment and Climate Change Canada at: ec.modeleacvcarburant-fuellcamodel.ec@canada.ca.

Where the bio-based content is from a bio-based content producer that has only between six to twelve consecutive months of operating data associated with the production of that bio-based content, calculations using GHGenius should be completed using all available data and best estimates as if the bio-based content producer had one full year of data. Once 12 consecutive months of data is available, the calculations should be replaced with calculations using the actual 12 month data.

GHG intensity of bio-based content from a bio-based content producer that has only six or fewer consecutive months of operating data for that bio-based content cannot be quantified using any methods in this Guideline.

3.2 Primary data inputs that shall be entered/changed in GHGenius for bio-based content

When using GHGenius to calculate GHG intensity for bio-based content, a person shall complete all cells as specified in the following tables using reproduceable and measurable data.

3.2.1 Model Set-Up

Item	Work Sheet	Cell(s)	Value to Input
Target year (year of analysis)	Input	B3	Use value corresponding to compliance period

Item	Work Sheet	Cell(s)	Value to Input
Country/region	Input	B5 to K5	Use an appropriate default button as per region of analysis
GWP selector (Global Warming Potential)	Input	B6	Use value of 2 (i.e. IPPC 2007 values).

3.2.2 Transportation Inputs

Feedstocks – Average km shipped

Item	Work Sheet	Cell(s)	Value(s) to Input[1]
By Rail	Input	B78 to AM78 as per feedstock(s) type	Value(s) based on verifiable source(s) or rail company values
Domestic water	Input	B79 to AM79 as per feedstock(s) type	Value(s) based on verifiable source(s), e.g. searates.com or sea-distances.org
International water	Input	B80 to AM80 as per feedstock(s) type	Value(s) based on verifiable source(s), e.g. searates.com or sea-distances.org
Pipeline, tram, conveyor	Input	B81 to AM81 as per feedstock(s) type	Value(s) based on verifiable source(s)
Truck	Input	B82 to AM82 as per feedstock(s) type	Value(s) based on verifiable source(s)

3.2.3 Feedstocks – Tonnes-shipped/tonne-produced

Item	Work Sheet	Cell(s)	Value(s) to Input
By Rail	Input	B84 to AM84 as per feedstock(s) type	Value(s) based on original source measurement(s)
Domestic water	Input	B85 to AM85 as per feedstock(s) type	Value(s) based on original source measurement(s)
International water	Input	B86 to AM86 as per feedstock(s) type	Value(s) based on original source measurement(s)

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[1] If inputting a zero value into cell(s) results in creating error message(s) in some cells that are linked to the input cell, may input '0.001' instead of '0'.

Item	Work Sheet	Cell(s)	Value(s) to Input
Pipeline, tram, conveyor	Input	B87 to AM87 as per feedstock(s) type	Value(s) based on original source measurement(s)
Truck	Input	B88 to AM88 as per feedstock(s) type	Value(s) based on original source measurement(s)

3.2.4 Finished Fuels – Average km shipped

Item	Work Sheet	Cell(s)	Value(s) to Input
By Rail	Input	B92 to AQ92 as per fuel type	Value(s) based on verifiable source(s) or rail company values
Domestic water	Input	B93 to AQ93 as per fuel type	Value(s) based on verifiable source(s), e.g. searates.com or sea-distances.org
International water	Input	B94 to AQ94 as per fuel type	Value(s) based on verifiable source(s), e.g. searates.com or sea-distances.org
Pipeline, tram, conveyor	Input	B95 to AQ95 as per fuel type	Value(s) based on verifiable source(s)
Truck	Input	B96 to AQ96 as per fuel type	Value(s) based on verifiable source(s)

3.2.5 Finished Fuels – Tonnes-shipped/tonne-produced

Item	Work Sheet	Cell(s)	Value(s) to Input
By Rail	Input	B98 to AQ98 as per fuel type	Value(s) based on original source measurement(s)
Domestic water	Input	B99 to AQ99 as per fuel type	Value(s) based on original source measurement(s)
International water	Input	B100 to AQ100 as per fuel type	Value(s) based on original source measurement(s)
Pipeline, tram, conveyor	Input	B101 to AQ101 as per fuel type	Value(s) based on original source measurement(s)
Truck	Input	B102 to AQ102 as per fuel type	Value(s) based on original source measurement(s)

3.3 Primary data inputs that shall be changed in GHGenius for bio-based content in gasoline

When using GHGenius to calculate GHG intensity for bio-based content in gasoline, a person shall complete all cells specified in the following tables using reproduceable and measurable data, where applicable.

3.3.1 Feedstock and Energy Inputs

Item (in base year)	Work Sheet	Cell(s)	Value(s) to Input
Base year	Input	F234, J234, K234, L234, R234 to AE234 or as per feedstock(s) and fuel type	Same as B3.
Net electricity purchased (kWh)	Input	B246 to M246 or AB236, BF236 as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Diesel (litres)	Input	R237 to AE237 or AS237, AT237, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Natural gas (litres)	Input	B238 to M238 or S248, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Coal (kg)	Input	B249 to M249 or B247, M247, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Wood, grass, crop residue, MSW, RDF (kg)	Input	R240 to AE240 or AS240, AT240, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Corn/soybeans/canola/wheat rendering, fish oil (kg)	Input	R241 to AE241 or AS241, AT241, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)

3.3.2 Chemical Inputs

Item	Work Sheet	Cell(s)	Value(s) to Input
Acetic Acid	Alt Fuel Prod	F29, G29, H30, Y29 to AM29, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Ammonia (NH3) (kg)	Alt Fuel Prod	F30, G30, H30, Y30 to AM30, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Ammonium Sulphate	Alt Fuel Prod	F31, G31, H31, Y31 to AM31, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Citric Acid	Alt Fuel Prod	F32, G32, H32, Y32 to AM32, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Enzymes	Alt Fuel Prod	F33, G33, H33, Y33 to AM33, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Ethanol	Alt Fuel Prod	F34, G34, H34, Y34 to AM34, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Hydrochloric acid	Alt Fuel Prod	F35, G35, H35, Y35 to AM35, as per feedstock(s) and fuel	Value(s) based on original source measurement(s)
Hydrogen	Alt Fuel Prod	F36, G36, H36, Y36 to AM36, as per feedstock(s) and fuel	Value(s) based on original source measurement(s)
Lime	Alt Fuel Prod	F37, G37, H37, Y37 to AM37, as per feedstock(s) and fuel	Value(s) based on original source measurement(s)

Item	Work Sheet	Cell(s)	Value(s) to Input
Magnesium silicate (kg)	Alt Fuel Prod	F38, G38, H38, Y38 to AM38, as per feedstock(s) and fuelAO38, AQ38, AS38, AU38, AW38, AY38, BA38, BC38, BE38 and/or BG38, or BN38, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Methanol (L)	Alt Fuel Prod	F39, G39, H39, Y39 to AM39, as per feedstock(s) and fuel	Value(s) based on original source measurement(s)
Sodium Hydroxide	Alt Fuel Prod	F40, G40, H40, Y40 to AM40, as per feedstock(s) and fuel	Value(s) based on original source measurement(s)
Nitric acid (kg)	Alt Fuel Prod	F41, G41, H41, Y41 to AM41, as per feedstock(s) and fuel	Value(s) based on original source measurement(s)
Nitrogen (N) (kg)	Alt Fuel Prod	F42, G42, H42, Y42 to AM42, as per feedstock(s) and fuel	Value(s) based on original source measurement(s)
Petroleum (L)	Alt Fuel Prod	F43, G43, H43, Y43 to AM43, as per feedstock(s) and fuel	Value(s) based on original source measurement(s)
Phosphate nutrients (P_2O_5) (kg)	Alt Fuel Prod	F44, G44, H44, Y44 to AM44, as per feedstock(s) and fuel	Value(s) based on original source measurement(s)

Item	Work Sheet	Cell(s)	Value(s) to Input
Phosphoric acid (kg)	Alt Fuel Prod	F45, G45, H45, Y45 to AM45, as per feedstock(s) and fuel	Value(s) based on original source measurement(s)
Potassium hydroxide (kg)	Alt Fuel Prod	F46, G46, H46, Y46 to AM46, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Seeds (kg)	Alt Fuel Prod	F47, G47, H47, Y47 to AM47, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Sodium methylate (kg)	Alt Fuel Prod	F48, G48, H48, Y48 to AM48, as per feedstock(s) and fuel	Value(s) based on original source measurement(s)
Sugar (kg)	Alt Fuel Prod	F49, G49, H49, Y49 to AM49, as per feedstock(s) and fuel	Value(s) based on original source measurement(s)
Sulphuric acid (kg)	Alt Fuel Prod	F50, G50, H50, Y50 to AM50, as per feedstock(s) and fuel	Value(s) based on original source measurement(s)
Yeast (kg)	Alt Fuel Prod	F51, G51, H51, Y51 to AM51, as per feedstock(s) and fuel	Value(s) based on original source measurement(s)

3.3.3 Co-Products and Integrated Plants

Item	Work Sheet	Cell(s)	Value to Input if primary data
Fraction liquid fuel displaced (by burning meal for power)	Coprods	V76, V77, V78	Value based on original source measurement

Item	Work Sheet	Cell(s)	Value to Input if primary data
Emissions displaced by co-products of corn and wheat-to-ethanol production	Coprods	A10-F10; A12-F12; A13-F13; A15-F15; A16-F16; A21-F21	Value based on original source measurement
Emissions displaced by carbon dioxide capture at ethanol plants instead of power plants	Coprods	A26-A27	Value based on original source measurement
Emission displaced by net electricity production	Coprods	G90:U90; G92-U92; G93-U93	Value based on original source measurement
Carbon Dioxide Capture with Ethanol Plant (0 for No, 1 for Yes)	Input	B254	Value based on original source measurement

3.4 Primary data inputs that shall be changed in GHGenius for bio-based content in diesel

When using GHGenius to calculate GHG intensity for bio-based content in diesel, a person shall complete all cells specified in the following tables using reproduceable and measurable data, where applicable.

3.4.1 Feedstock and Energy Inputs

Item (in base year)	Work Sheet	Cell(s)	Value(s) to Input[2]
Base year	Input	AF234 to AR234 or BH234, D234, E234, J234, K234 and L234 as per feedstock(s) and fuel type	Same as B3.
Net electricity purchased (kWh)	Input	AF236 to AR236 or BH236 as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Diesel (litres)	Input	AF237 to AR237 or BH237 as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Natural gas (litres)	Input	AF238 to AR238 or BH238 as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Coal (kg)	Input	AF239 to AR239 or BH239 as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Wood, grass, crop residue, MSW, RDF (kg)	Input	AF240 to AR240 or BH240 as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Corn/soybeans/canola/wheat rendering, fish oil (kg)	Input	AF241 to AR241 or BH241 as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)

3.4.2 Chemical Inputs

Item	Work Sheet	Cell(s)	Value(s) to Input
Acetic Acid (kg)	Alt Fuel Prod	AO29, AQ29, AS29, AU29, AW29, AY29, BA29, BC29, BE29 and/or BG29, or BN29, as per	Value(s) based on original source measurement(s)

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[2] If inputting a zero value into cell(s) results in creating error message(s) in some cells that are linked to the input cell, may input '0.001' instead of '0'.

Item	Work Sheet	Cell(s)	Value(s) to Input
		feedstock(s) and fuel type	
Ammonia (NH3) (kg)	Alt Fuel Prod	AO30, AQ30, AS30, AU30, AW30, AY30, BA30, BC30, BE30 and/or BG30, or BN30, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Ammonium Sulphate (kg)	Alt Fuel Prod	AO31, AQ31, AS31, AU31, AW31, AY31, BA31, BC31, BE31 and/or BG31, or BN31, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Citric Acid	Alt Fuel Prod	AO32, AQ32, AS32, AU32, AW32, AY32, BA32, BC32, BE32 and/or BG32, or BN32, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Enzymes	Alt Fuel Prod	AO33, AQ33, AS33, AU33, AW33, AY33, BA33, BC33, BE33 and/or BG33, or BN33, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Ethanol	Alt Fuel Prod	AO34, AQ34, AS34, AU34, AW34, AY34, BA34, BC34, BE34 and/or BG34, or BN34, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Hydrochloric acid	Alt Fuel Prod	AO35, AQ35, AS35, AU35, AW35, AY35, BA35, BC35, BE35 and/or BG35, or BN35, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)

Item	Work Sheet	Cell(s)	Value(s) to Input
Hydrogen	Alt Fuel Prod	AO36, AQ36, AS36, AU36, AW36, AY36, BA36, BC36, BE36 and/or BG36, or BN36, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Lime (kg)	Alt Fuel Prod	AO37, AQ37, AS37, AU37, AW37, AY37, BA37, BC37, BE37 and/or BG37, or BN37, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Magnesium silicate (kg)	Alt Fuel Prod	AO38, AQ38, AS38, AU38, AW38, AY38, BA38, BC38, BE38 and/or BG38, or BN38, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Methanol (L)	Alt Fuel Prod	AO39, AQ39, AS39, AU39, AW39, AY39, BA39, BC39, BE39 and/or BG39, or BN39, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Sodium Hydroxide	Alt Fuel Prod	AO40, AQ40, AS40, AU40, AW40, AY40, BA40, BC40, BE40 and/or BG40, or BN40, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Nitric acid (kg)	Alt Fuel Prod	AO41, AQ41, AS41, AU41, AW41, AY41, BA41, BC41, BE41 and/or BG41, or BN41, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Nitrogen (N) (kg)	Alt Fuel Prod	AO42, AQ42, AS42, AU42, AW42, AY42, BA42, BC42, BE42	Value(s) based on original source measurement(s)

Item	Work Sheet	Cell(s)	Value(s) to Input
		and/or BG42, or BN42, as per feedstock(s) and fuel type	
Petroleum (L)	Alt Fuel Prod	AO43, AQ43, AS43, AU43, AW43, AY43, BA43, BC43, BE43 and/or BG43, or BN43, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Phosphate nutrients (P$_2$O$_5$) (kg)	Alt Fuel Prod	AO44, AQ44, AS44, AU44, AW44, AY44, BA44, BC44, BE44 and/or BG44, or BN44, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Phosphoric acid (kg)	Alt Fuel Prod	AO45, AQ45, AS45, AU45, AW45, AY45, BA45, BC45, BE45 and/or BG45, or BN45, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Potassium hydroxide (kg)	Alt Fuel Prod	AO46, AQ46, AS46, AU46, AW46, AY46, BA46, BC46, BE46 and/or BG46, or BN46, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Seeds (kg)	Alt Fuel Prod	AO47, AQ47, AS47, AU47, AW47, AY47, BA47, BC47, BE47 and/or BG47, or BN47, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Sodium methylate (kg)	Alt Fuel Prod	AO48, AQ48, AS48, AU48, AW48, AY48, BA48, BC48, BE48 and/or BG48, or BN48, as per	Value(s) based on original source measurement(s)

Item	Work Sheet	Cell(s)	Value(s) to Input
		feedstock(s) and fuel type	
Sugar (kg)	Alt Fuel Prod	AO49, AQ49, AS49, AU49, AW49, AY49, BA49, BC49, BE49 and/or BG49, or BN49, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Sulphuric acid (kg)	Alt Fuel Prod	AO50, AQ50, AS50, AU50, AW50, AY50, BA50, BC50, BE50 and/or BG50, or BN50, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)
Yeast (kg)	Alt Fuel Prod	AO51, AQ51, AS51, AU51, AW51, AY51, BA51, BC51, BE51 and/or BG51, or BN51, as per feedstock(s) and fuel type	Value(s) based on original source measurement(s)

3.4.3 Co-Products and Integrated Plants

Item	Work Sheet	Cell(s)	Value(s) to Input if primary data
Glycerine (feed) (kg)	Coprods	Y99	Value based on original source measurement
Glycerine (fuel) (kg)	Coprods	Y100	Value based on original source measurement
Glycerine (crude) (kg)	Coprods	Y101	Value based on original source measurement
Glycerine (refined) (kg)	Coprods	Y102	Value based on original source measurement

Item	Work Sheet	Cell(s)	Value(s) to Input if primary data
Propylene glycol (kg)	Coprods	Y109	Value based on original source measurement
Other gaseous (displacing fossil origin) (L)	Coprods	AO106	Value based on original source measurement
Other liquid (displacing fossil origin) (L)	Coprods	AO108	Value based on original source measurement
Emissions displaced by co-products of biodiesel production	Coprods	A33:A35	Value based on original source measurement

3.4.4 The following inputs are to be used only if primary data is available (i.e. if you are an integrated bio-based diesel plant)

Item	Work Sheet	Cell(s)	Value to Input if primary data
Kilograms of algae meal produced per litre of algae oil produced and used as feed	Input	B256	Value based on original source measurement
Kilograms of bone meal produced per litre of tallow from animal fats produced	Input	B257	Value based on original source measurement
Kilograms of fish meal produced per litre of fish oil produced	Input	B258	Value based on original source measurement

Item	Work Sheet	Cell(s)	Value to Input if primary data
Kilograms of palm meal produced per litre of palm oil produced	Input	B259	Value based on original source measurement
Kilograms per litre of meal burned for power	Coprods	V76	Value based on original source measurement
Fraction electricity displaced (by burning meal for power)	Coprods	V77	Value based on original source measurement
Fraction liquid fuel displaced (by burning meal for power)	Coprods	V78	Value based on original source measurement

3.5 Treatment of Multiple Feedstocks

Fuel suppliers shall use one of the following methods to calculate the weighted average GHG intensity for bio-based content produced in facilities with multiple feedstocks:

3.5.1 Method 1: Feedstock-specific allocation

Separate GHG intensities shall be allocated on a quarterly basis to specific volumes of bio-based content produced by the facility according to the feedstock purchased or used at a facility over the quarterly period.

3.5.2 Method 2: Facility average basis

A single GHG intensity value shall be allocated for all bio-based content produced by the facility, based on the weighted average of feedstocks used over a quarterly or annual period.

For greater certainty, when applying either of these methods, the fuel supplier shall ensure, as required by the Regulation, that only bio-based content that is first placed in the Ontario market is counted for the purpose of the Regulation and that bio-based content that is produced at the facility and not first placed in the Ontario market (e.g. is placed in the market of another province) is not counted for the purposes of the Regulation.

Fuel suppliers shall report feedstocks used and product type, e.g. fatty acid methyl ester, Fischer-Tropsch, hydrogenation derived renewable diesel, ethanol or renewable gasoline. The choice of accounting approaches is at the discretion of fuel suppliers and bio-based fuel producers.

3.6 Treatment of Non-Fuel Products

When determining the GHG intensity of bio-based content produced at a facility that also produces additional non-fuel products with different GHG intensities, (e.g. medical or beverage-grade ethanol, etc) fuel suppliers shall use one of the methods set out below to calculate the weighted average GHG intensity of the fuel-grade bio-based content produced at that facility and first placed in the Ontario market. The methodology to be used shall be selected in accordance with the following rules:

1) A facility shall use Method 1 (Direct Measurement) where possible.
2) If Method 1 (Direct Measurement) cannot be used because direct bio-based fuel product-specific input data is not available, method 2 (Output-Based Allocation) shall be used.
3) When methods 1 or 2 cannot be used because the allocation of input data for the different products cannot be reasonably determined, then method 3 (Facility Average) shall be used.

3.6.1 Method 1: Direct Measurement

Fuel suppliers shall calculate the GHG intensities on a quarterly basis for all fuel-grade bio-based content produced by the facility according to the energy used at a facility over the quarterly period. These calculations shall be based on direct measurements of all relevant inputs (e.g. natural gas or electricity usage).

3.6.2 Method 2: Output-Based Allocation

Where direct measurements of inputs for fuel-grade products are not available, fuel suppliers shall use the following output-based allocation methodology.

1) Calculate the GHG intensities of the fuel-grade products and the non-fuel products as separate processes.
2) Document that the weighted average GHG intensity of all products is consistent with the total facility inputs.
3) Document what plant processes are excluded from fuel grade products and the rationale for exclusion.
4) Enter the prorated values for the bio-based content considered a fuel in Section 3.3.

3.7 Model Results: Calculating the GHG intensity of bio-based content

The instructions in this section pertain to the calculation of individual GHG intensities for bio-based content.

3.7.1 Calculating the GHG intensity of bio-based content in gasoline

In the GHGenius model, the individual GHG value for a specific volume of bio-based content in gasoline is the feedstock-appropriate sum value in row 20 on the "Upstream Results HHV" sheet, plus the fuel-appropriate value in row 97 on the "Exhaust Emissions" sheet.

3.7.2 Calculating the GHG intensity of bio-based content in diesel

In the GHGenius model, the individual GHG value for a specific volume of bio-based content in diesel is the feedstock-appropriate sum value in row 20 on the "Upstream Results HHV" sheet, plus the fuel-appropriate value in row 143 on the "Exhaust Emissions" sheet

3.8 Determining GHG Intensity of bio-based content that is not in GHGenius

Subsection 7(2) of the Regulation allows for fuel suppliers to apply to the Director in accordance with this Guideline for approval of a model to calculate the GHG intensity of bio-based content not listed in the Guideline. Applications made pursuant to that section shall include the following where applicable:

- An explanation of the fuel production technology and how the technology differs from the existing technology in GHGenius 4.03a or 4.03b or 4.03c
- An explanation of the new feedstock including a description of the inputs used to calculate the GHG intensity of the feedstock

- A description of all modifications made to an existing facility or a description of how a new facility process is different than a facility process that is already included in GHGenius 4.03a or 4.03b or 4.03c.
- A comprehensive description of the life cycle analysis applied to determine GHG intensity, including all background data and emissions factors and, where applicable, an explanation of the GHG lifecycle model and version that should be used to calculate the GHG intensity of the bio-based fuel:
  - Where the proposed model is proposed to be based on a modified GHGenius 4.03a or 4.03b or 4.03c pathway:
    - a list of cells that were modified
    - an explanation about why a modified pathway has more precision and more accurately reflects emissions than an existing one
    - a summary of reasons for selecting the cells and values that were chosen
    - a process flow diagram detailing the modified pathway
    - conversion factors and calculations used and supporting materials
  - If a new pathway that is not in GHGenius 4.03a or 4.03b or 4.03c should be created:
    - a list of cells that were chosen
    - a summary of reasons for selecting the cells and values that were chosen
    - a process flow diagram
    - conversion factors and calculations used and supporting materials

Requests that the Director approve a proposed model to calculate the GHG intensity of bio-based content not listed in GHGenius 4.03a or GHGenius 4.03b or GHGenius 4.03c should be sent to: fuels-report@ontario.ca

Alternatively, the request can be mailed to:
Assistant Director, West Central Region
Ministry of the Environment, Conservation and Parks
Ellen Fairclough Building
119 King Street West, 12th Floor
Hamilton ON L8P 4Y7
Re: Cleaner Fuels methodology request

3.9 GHG Intensity, Expiry and Recalculation

Where Schedule 1 of the Regulation requires that a fuel supplier calculate the GHG intensity of particular bio-based content, calculations made using data input into GHGenius in accordance with the most recent version of this Guideline, prior to the

current version or, in the case of calculations made before January 1, 2020, the most recent Director's Directions, shall be considered valid unless:

- There is a significant change in the production process or other data input into the model (e.g. feedstock, travel distances) that can reasonably be expected to change the GHG intensity of the bio-based content by 5% or more; or
- A different means of calculating GHG intensity of the bio-based content is required by the current version of the Guideline.

If either of the two conditions identified in the preceding paragraph exist, then a recalculation of GHG intensity is required.

3.10 Director's Determinations

This section applies to the following bio-based content not found in GHGenius:

3.10.1 Biodiesel derived from brown grease

For biodiesel derived from brown grease, complete all specified cells in the same manner as biodiesel from yellow grease in GHGenius.

3.10.2 Biodiesel derived from fatty acid distillates

For biodiesel derived from fatty acid distillates (FADs) that are considered a waste with no GHG emissions attributed to them, complete all specified cells in the same manner as biodiesel from yellow grease in GHGenius.

3.10.3 Renewable diesel derived from biodiesel distillate bottoms

For renewable diesel from biodiesel distillate bottoms (BDBs) that are considered a waste with no GHG emissions attributed to them, complete all specified cells in the same manner as renewable diesel from yellow grease in GHGenius.

3.11 Renewable Energy

The following shall be used to calculate GHG intensities in GHGenius when renewable electricity or renewable natural gas is directly connected and used on-site in the production of bio-based content.

3.11.1 Renewable electricity

In GHGenius, in the "Input" worksheet, set net electricity purchased (the cell from B246 to M246 that corresponds with the set region of analysis) to the total electricity use (in kWh), minus the amount of direct connected renewable electricity used on-site (in kWh).

3.11.2 Renewable natural gas

In GHGenius, in the "Input" worksheet, set total coal and natural gas energy use (the cell from B247 to M247 that corresponds with the set region of analysis) to the total coal and natural gas use (in MJ), minus the amount of direct connected renewable natural gas used on-site (in MJ).

4. Part B: Compliance Equation Values

Where Schedule 1 requires a fuel supplier to enter values for the fossil fuel baseline and the corresponding GHG intensity reduction requirement, the values should be entered in the formula as follows:

4.1 Fossil Fuel Baseline

- The value for letter x (diesel) in s.1 of Schedule 1, is: 91.9 gCO2e/MJ
- The value for letter x (gasoline) in s.2 of Schedule 1, is: 83.9 gCO2e/MJ

4.2 GHG Intensity Reduction Requirement of Bio-Based Content

- The value for letter z (diesel) in s.1 of Schedule 1, is: 64.3 gCO2e/MJ
- The value for letter z (gasoline) in s.2 of Schedule 1 from the years 2020 to 2029 is: 37.8 gCO2e/MJ
- The value for letter z (gasoline) in s.2 of Schedule 1, for the year 2030 and all subsequent years is: 42.0 gCO2e/MJ

5. Part C: Quality Standards for Fuels

5.1 Quality standards for blended diesel

Pursuant to Section 6 of the Regulation, no fuel supplier shall transfer blended diesel for use or sale in Ontario unless the blended diesel meets the standards and specifications set out in one of following documents:

1. Canadian General Standards Board (CGSB) document CAN/CGSB – 3.520-2011 – Automotive Diesel Fuel Containing Low Levels of Biodiesel (B1-B5), as amended from time to time.

2. Canadian General Standards Board (CGSB) document CAN/CGSB – 3.522-2011 – Diesel Fuel Containing Biodiesel (B6-B20), as amended from time to time.

3. Canadian General Standards Board (CGSB) document CAN/CGSB – 3.524-2011 – Biodiesel (B100) for Blending in Middle Distillate Fuels, as amended from time to time.

4. Canadian General Standards Board (CGSB) document CAN/CGSB – 3.517-2013 – Diesel Fuel, as amended from time to time.

5. American Society for Testing and Materials (ASTM) document ASTM – D6751-12 – Standard Specification for Biodiesel Fuel Blend Stock B100 for Middle Distillate Fuels, as amended from time to time.

6. American Society for Testing and Materials (ASTM) document ASTM – D7467-13 – Standard Specification for Diesel Fuel Oil, Biodiesel Blend (B6 to B20), as amended from time to time.

7. American Society for Testing and Materials (ASTM) document ASTM – D975-14 – Standard Specification for Diesel Fuel Oils, as amended from time to time.

8. An equivalent set of standards and specifications that is approved in writing by the Director before the blended gasoline is distributed.

5.2 Quality standards for blended gasoline

Pursuant to Section 6 of the Regulation, no fuel supplier shall transfer blended gasoline for use or sale in Ontario unless the blended gasoline meets the standards and specifications set out in one of the following documents as applicable to the type of fuel:

1. Canadian General Standards Board (CGSB) document CAN/CGSB-3.511, as amended from time to time.

2. Canadian General Standards Board (CGSB) document CAN/CGSB-3.5, as amended from time to time.

3. Canadian General Standards Board (CGSB) document CAN/CGSB-3.512, as amended from time to time.

4. An equivalent set of standards and specifications that is approved in writing by the Director before the blended gasoline is distributed.