Appendix 1:
Lookup table for established pathways

Renewable fuels greenhouse gas emissions eligibility standard

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Appendix 1: Lookup table for established pathways | Alberta Environment and Protected Areas

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Overview

This Appendix references the Renewable Fuels Greenhouse Gas Emissions Eligibility Standard as defined by the Renewable Fuels Standard Regulation, an associated regulation for Alberta's Emissions Management and Climate Resilience Act.

Definitions

Term	Meaning
Eastern Canadian produced	Produced in Ontario (ON) and/or Quebec (QC)
GJ	Gigajoules
kWh	kilowatt hours
L	Litres
MJ	Megajoules
US	United States (including only the lower 48 states)
Western Canadian produced	Produced in Alberta (AB), British Columbia (BC), Manitoba (MN) and/or Saskatchewan (SK)

Lookup Table for Established Pathways

Biofuel	Established pathway description	Pass / Not a Pass	Carbon intensity† and default plant configuration	Validation code
Renewable alcohols				
Ethanol from wheat	• Western Canadian produced feedstock • Biomass processing fuel	Pass	18,801 g CO_2e/GJ Fuel-producing region: AB Electricity (2007)‡: 0.30 kWh Biomass (2007): 0.633 kg	AEWH-CAWC-XX-100-00-00
	• Western Canadian produced feedstock • Natural gas processing fuel • Equal to or less than 16.1 MJ of natural gas per litre • Equal to or less than 0.50 kWh of electricity per litre	Pass	42,879 g CO_2e/GJ Fuel-producing region: AB Electricity (2007): 0.30 kWh Natural gas (2007): 13.06 MJ	AEWH-CAWC-XX-205-06-00
	• Western Canadian produced feedstock • Natural gas processing fuel • More than 16.1 MJ of natural gas per litre • More than 0.50 kWh of electricity per litre	Not a Pass	n/a	n/a

Renewable alcohols				
Ethanol from barley	• Western Canadian produced feedstock • Biomass processing fuel	Pass	22,336 g CO_2e/GJ Fuel-producing region: AB Electricity (2007): 0.32 kWh Biomass (2007): 0.784 kg	AEBA-CAWC-XX-100-00-00
	• Western Canadian produced feedstock • Natural gas processing fuel • Equal to or less than 15.5 MJ of natural gas per litre • Equal to or less than 0.50 kWh of electricity per litre	Pass	49,415 g CO_2e/GJ Fuel-producing region: AB Electricity (2007): 0.32 kWh Natural gas (2007): 13.06 MJ	AEBA-CAWC-XX-206-06-00
	• Western Canadian produced feedstock • Natural gas processing fuel • More than 15.5 MJ of natural gas per litre • More than 0.50 kWh of electricity per litre	Not a Pass	n/a	n/a

Renewable alcohols				
Ethanol from sugar beet	• Anywhere produced feedstock • Biomass processing fuel	Pass	62,674 g CO_2e/GJ Fuel-producing region: AB Electricity (2007): 0.32 kWh Biomass (2007): 0.778 kg	AESB-XXXX-XX-100-00-00
	• Anywhere produced feedstock • Natural gas processing fuel	Not a Pass	n/a	n/a
Ethanol from corn	• Eastern Canadian produced feedstock • Ethanol shipped to Alberta • Biomass processing fuel	Pass	35,145 g CO_2e/GJ Fuel-producing region: ON Electricity (1999): 0.22 kWh Biomass (1999): 0.434 kg	AECN-CAEC-XX-100-00-00
	• Eastern Canadian produced feedstock • Ethanol shipped to Alberta • Natural gas processing fuel • Equal to or less than 12.4 MJ of natural gas per litre • Equal to or less than 0.30 kWh of electricity per litre	Pass	51,143 g CO_2e/GJ Fuel-producing region: ON Electricity (1999): 0.22 kWh Natural gas (1999): 10.0 MJ	AECN-CAEC-XX-204-04-00

Renewable alcohols				
Ethanol from corn	• Eastern Canadian produced feedstock • Ethanol shipped to Alberta • Natural gas processing fuel • More than 12.4 MJ of natural gas per litre • More than 0.30 kWh of electricity per litre	Not a Pass	n/a	n/a
	• US produced feedstock • Ethanol shipped to Alberta • Biomass processing fuel	Pass	35,741 g CO_2e/GJ Fuel-producing region: US Central Electricity (1999): 0.25 kWh Biomass (1999): 0.434 kg	AECN-USXX-XX-100-00-00
	• US produced feedstock • Ethanol shipped to Alberta • Natural gas processing fuel • Equal to or less than 10.5 MJ of natural gas per litre • Equal to or less than 0.25 kWh of electricity per litre	Pass	54,005 g CO_2e/GJ Fuel-producing region: US Central Electricity (1999): 0.25 kWh Natural gas **(**1999): 10.0 MJ	AECN-USXX-XX-202-03-00

Renewable alcohols				
Ethanol from corn	• US produced feedstock • Ethanol shipped to Alberta • Natural gas processing fuel • More than 10.5 MJ of natural gas per litre • More than 0.25 kWh of electricity per litre	Not a Pass	n/a	n/a
	• US produced feedstock • Ethanol shipped to Alberta • Natural gas processing fuel • Equal to or less than 9.0 MJ of natural gas per litre • Equal to or less than 0.35 kWh of electricity per litre	Pass	58,407 g CO_2e/GJ Fuel-producing region: US Central Electricity (2017): 0.283 kWh Natural gas (2017): 7.58 MJ	AECN-USXX-XX-202-03-01
	• US produced feedstock • Ethanol shipped to Alberta • Natural gas processing fuel • Equal to or less than 10.7 MJ of natural gas per litre • Equal to or less than 0.30 kWh of electricity per litre	Pass	62,977 g CO_2e/GJ Fuel-producing region: US Central Electricity (2018): 0.282 kWh Natural gas (2018): 10.1 MJ Diesel (2018): 0.000943 L	AECN-USXX-XX-202-03-02

Renewable alcohols				
Ethanol from corn	• US produced feedstock • Ethanol shipped to Alberta • Coal processing fuel	Pass	63,461 g CO_2e/GJ Fuel-producing region: US Central Electricity (1999): 0.25 kWh Coal (1999): 10.0 MJ	AECN-USXX-XX-203-00-00
	• Western Canadian produced feedstock • Fuel produced in Western Canada • Equal to or less than 17.5 MJ of natural gas per litre • Equal to or less than 0.40 kWh of electricity per litre • Products shipped to Alberta by rail	Pass	38,526 g CO_2e/GJ Fuel-producing region: MN Electricity (1999): 0.22 kWh Natural gas (1999): 10.0 MJ	AECN-CAWC-XX-204-05-01
	• Western Canadian produced feedstock • Fuel produced in Western Canada • Equal to or less than 15.1 MJ of natural gas per litre • Equal to or less than 0.40 kWh of electricity per litre • Products shipped to Alberta by truck	Pass	37,473 g CO_2e/GJ Fuel-producing region: SK Electricity (1999): 0.22 kWh Natural gas (1999): 10.0 MJ	AECN-CAWC-XX-203-05-02

Renewable alcohols				
Ethanol from corn	• US produced feedstock • Fuel produced in Western Canada • More than 8.6 MJ of natural gas per litre • More than 0.40 kWh of electricity per litre	Not a Pass	n/a	n/a
	• US produced feedstock • Fuel produced in Western Canada • Equal to or less than 9.1 MJ of natural gas per litre • Equal to or less than 0.40 kWh of electricity per litre • Products shipped by truck	Pass	48,857 g CO_2e/GJ Fuel-producing region: AB Electricity (2010): 0.277 kWh Natural gas (2010): 5.31 MJ	AECN-CAWC-IC-210-05-02

Renewable alcohols				
Ethanol from corn	• US produced feedstock • Fuel produced in Western Canada • Equal to or less than 9.4 MJ of natural gas per litre • Equal to or less than 0.40 kWh of electricity per litre • Products shipped by rail	Pass	54,752 g CO_2e/GJ Fuel-producing region: AB Electricity (1999): 0.40 kWh Natural gas (1999): 9.4 MJ	AECN-CAWC-IC-201-05-01
	• US produced feedstock • Fuel produced in Western Canada • More than 9.4 MJ of natural gas per litre • More than 0.40 kWh of electricity per litre • Products shipped by rail	Not a Pass	n/a	n/a
	• Anywhere produced feedstock • 70 per cent or more of processing fuel energy comes from waste heat	Pass	40,665 g CO_2e/GJ Fuel-producing region: US Central Electricity (1999): 0.25 kWh Natural gas (1999): 0.057 MJ Coal (1999): 2.419 MJ	AECN-XXXX-XX-207-00-00

Renewable alcohols

Ethanol from corn	• US produced feedstock • Fuel produced in Western Canada • Electricity used from a local grid with more than 90 per cent renewable power • Equal to or less than 12.3 MJ of natural gas per litre • Equal to or less than 0.40 kWh of electricity per litre	Pass	54,800 g CO_2e/GJ Fuel-producing region: MN Electricity (1999): 0.30 kWh Natural gas (1999): 11.7 MJ	AECN-CAWC-IC-206-10-00
	• US produced feedstock • Ethanol shipped to Alberta • Thermal energy for processing from waste steam	Pass	40,013 g CO_2e/GJ Fuel-producing region: US Central Electricity (1999): 0.25 kWh Natural gas (1999): 1.232 MJ Coal (1999): 1.232 MJ Diesel: 0.0005 L	AECN-USXX-XX-101-00-00
Ethanol from Municipal Waste Materials	• Site approved as a “renewable fuel feedstock type” under the guideline for municipal waste materials	Pass	n/a	AEMW-XXXX-XX-000-02-00

Renewable alcohols				
Ethanol from Municipal Waste Materials	• Site not approved as a “renewable fuel feedstock type” under the guideline for municipal waste materials	Not a Pass	n/a	n/a
	• Site approved as a “renewable fuel feedstock type” under the guideline for municipal waste materials • Enerkem Alberta Biofuels LP process	Pass	n/a	AEMW-CAWC-XX-101-02-00
Ethanol from sugarcane	• Feedstock produced on land that was in agricultural production on January 1, 2008 or on land that is zoned for sugar cane expansion by the Brazilian government	Pass	50,434 g CO_2e/GJ Fuel-producing region: AB Biomass (2010): 2.92 kg Mechanical Harvesting: Yes Burning: No	AESC-BRAA-XX-100-00-00
	• Feedstock produced in a location that was not in agricultural production on January 1, 2008 or on land that is not zoned for sugarcane expansion by the Brazilian government	Not a Pass	n/a	n/a

Biofuel	Established pathway description	Pass / Not a Pass	Carbon intensity† and default plant configuration	Validation code
Bio-based diesels				
Biodiesel from Canola	• Feedstock and fuel produced anywhere	Pass	8,639 g CO_2e/GJ Fuel-producing region: AB Electricity (2008): 0.03 kWh Natural gas (2008): 20.2 MJ	DBCA-XXXX-XX-000-00-00
Biodiesel from Carinata	• Feedstock and fuel produced anywhere	Pass	10,681 g CO_2e/GJ Fuel-producing region: AB Electricity (2008): 0.03 kWh Natural gas (2008): 20.2 MJ	DBBC-XXXX-XX-000-00-00
Biodiesel from Corn Oil	• Feedstock and fuel produced anywhere	Pass	22,853 g CO_2e/GJ Fuel-producing region: US Central Electricity (2000): 0.10 kWh Natural gas (2000): 95.1 MJ	DBCG-XXXX-XX-000-00-00
Biodiesel from Soy	• Feedstock and fuel produced anywhere	Pass	13,369 g CO_2e/GJ Fuel-producing region: US Central Electricity (2008): 0.03 kWh Natural gas (2008): 20.2 MJ	DBSY-XXXX-XX-000-00-00

Bio-based diesels					
Biodiesel from Tallow	•	Feedstock and fuel produced anywhere	Pass	16,393 g CO2e/GJ Fuel-producing region: AB Electricity (2008): 0.10 kWh Natural gas (2008): 95.1 MJ	DBTA-XXXX-XX-000-00-00
Biodiesel from Yellow Grease	•	Feedstock and fuel produced anywhere	Pass	9,474 g CO_2e/GJ Fuel-producing region: AB Electricity (2008): 0.10 kWh Natural gas (2008): 95.1 MJ	DBYG-XXXX-XX-000-00-00
Biodiesel from Palm	•	Feedstock and fuel produced anywhere	Not a Pass	n/a	n/a
	•	Palm oil that is certified by an independent third party as not originating from plantings that, since November 2005, replaced primary forest			
Biodiesel from Palm	•	Feedstock and fuel produced anywhere	Not a Pass	n/a	n/a
Hydro-treated Biofuel from Canola	•	Feedstock and fuel produced anywhere	Pass	21,901 g CO_2e/GJ Fuel-producing region: AB Electricity (2012): 0.08 kWh Natural gas (2012): 6.00 MJ	DHCA-XXXX-XX-000-00-00

Bio-based diesels					
Hydro-treated Biofuel from Corn Oil	•	Feedstock and fuel produced anywhere	Pass	39,316 g CO_2e/GJ Fuel-producing region: SE Asia Electricity (2012): 0.08 kWh Natural gas (2012): 6.00 MJ	DHCG-XXXX-XX-000-00-00
Hydro-treated Biofuel from Soy	•	Feedstock and fuel produced anywhere	Pass	35,630 g CO_2e/GJ Fuel-producing region: SE Asia Electricity (2012): 0.08 kWh Natural gas (2012): 6.00 MJ	DHSY-XXXX-XX-000-00-00
Hydro-treated Biofuel from Tallow	•	Feedstock and fuel produced anywhere	Pass	33,236 g CO_2e/GJ Fuel-producing region: SE Asia Electricity (2012): 0.08 kWh Natural gas (2012): 6.00 MJ	DHTA-XXXX-XX-000-00-00
Hydro-treated Biofuel from Yellow Grease	•	Feedstock and fuel produced anywhere	Pass	25,406 g CO_2e/GJ Fuel-producing region: SE Asia Electricity (2012): 0.08 kWh Natural gas (2012): 6.00 MJ	DHYG-XXXX-XX-000-00-00

Bio-based diesels				
Hydro-treated Biofuel from Palm	• Feedstock and fuel produced anywhere • Palm oil that is certified by an independent third party as not originating from plantings that, since November 2005, replaced primary forest	Not a Pass	n/a	n/a
Hydro-treated Biofuel from Palm	• Feedstock and fuel produced anywhere • Palm oil that is sourced from plantations that are certified by either the Roundtable on Sustainable Palm Oil (RSPO) or International Sustainability and Carbon Certification (ISCC)	Not a Pass	n/a	n/a
Hydro-treated Biofuel from Palm	• Feedstock and fuel produced anywhere	Not a Pass	n/a	n/a
Hydro-treated Biofuel from Waste Biogenic Oils	• Feedstock and fuel produced anywhere • Biogenic waste limited to feedstock from fish processing facilities and waste biogenic oils from the production of palm oil	Not a Pass	n/a	n/a
Hydro-treated Biofuel from Biodiesel Plant Distillation Bottoms	• Feedstock and fuel produced anywhere • REG Geismar, LLC process	Pass	n/a	DHDB-XXXX-XX-000-00-00
Hydro-treated Biofuel from Camelina	• Feedstock and fuel produced in US • Montana Renewables, LLC process	Pass	46,644 g CO_2e/GJ	DHCM-XXXX-XX-000-00-00
Synthetic Biofuel from Wood Waste	• Feedstock and fuel produced anywhere • Candaxa Energy Inc. process	Pass	n/a	DSWW-XXXX-XX-000-00-00

Bio-based diesels				
Synthetic Biofuel from Wood Waste	• Feedstock and fuel produced anywhere • Cielo Waste Solutions Corp. process	Pass	n/a	DSWW-XXXX-XX-100-00-00

† Per unit of biofuel

‡ Base year