GHG EMISSIONS INTENSITY OF CANADIAN PROPANE

CPA Summary

Canadian Propane Association / Association canadienne du propane

The Canadian Propane Association (CPA) is focused on supporting Canada's climate change goals while continuing to ensure access to a secure, reliable and affordable energy supply for Canadians, including millions living in Indigenous, rural and remote communities.

The CPA contracted an independent firm, IHS Markit, now part of S&P Global Commodity Insights, to complete a product lifecycle analysis of the GHG emissions intensity of Canadian propane.

The IHS Markit analysis, which was based on three distinct propane pathways, shows that the average GHG intensity of Canadian propane has an emissions intensity of 72 gCO2e/MJ (volume-weighted average). This estimate is approximately 3% lower than the Environment Climate Change Canada (ECCC) estimate under the Clean Fuel Standard (74 gCO2e/MJ).[1]

[1] Note that the life-cycle boundaries exclude GHG emissions associated with land-use change and fabrication and construction

"This study shows how propane can be used today to reduce emissions. With further innovation on the horizon, low-carbon Canadian propane can serve the energy needs of future generations with even more sustainable solutions." -Shannon Watt, President and CEO of the Canadian Propane Association.

HIGHLIGHTS

*This study provides a credible, independent, peer-reviewed result that supports the low-emission profile of Canadian propane. Propane can and should play a role in the energy transition.

*The CPA proposes the baseline carbon intensity for Canadian propane is 72 gCO2e/MJ.

*Canadian carbon intensities are as low as 4% less than what is currently referenced in some jurisdictions.

*Propane has a lower carbon intensity value than gasoline and diesel, and it is on par with liquified natural gas.

Carbon intensity is a critical metric in climate policies aimed at reducing emissions. Policies in Canada, such as the Clean Fuel Standard (CFS) and B.C.'s Low Carbon Fuel Standard (LCFS), create a financial incentive to reward low-carbon fuels in proportion to the number of measurable emissions reductions they yield.

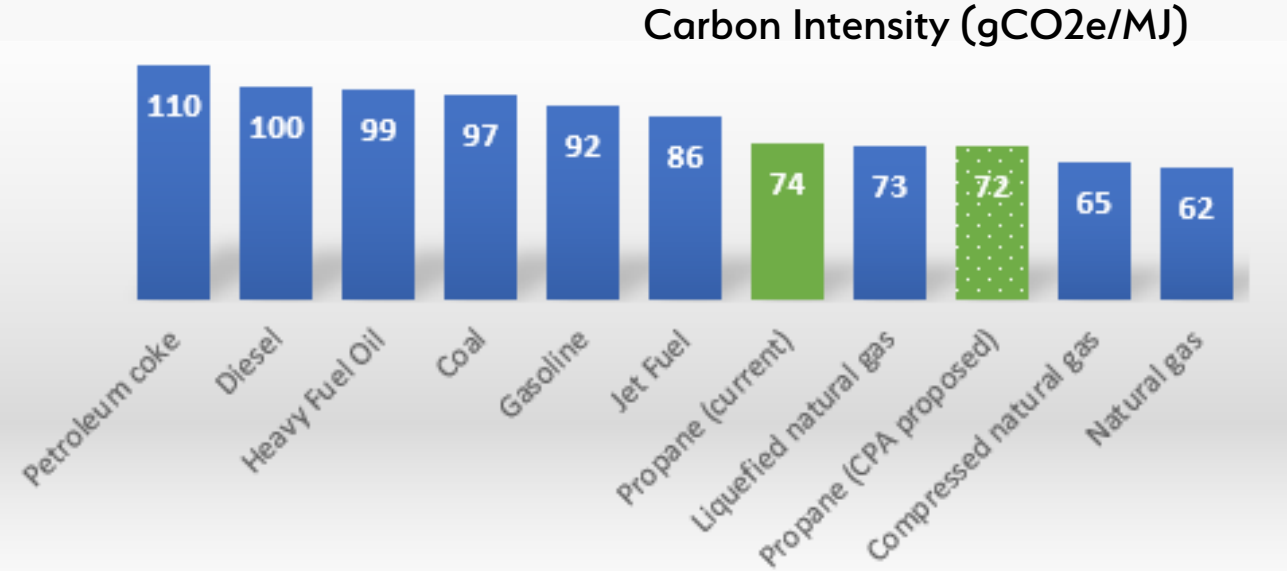
Whether it be direct mandatory requirements or a request from investors, carbon intensity metrics are moving into the mainstream of reporting requirements. Major advances are being made today regarding renewable propane, sourced from used cooking oil and other waste products, for a carbon-neutral energy source that adds no new carbon to the atmosphere when burned.

Propane is one of the cleanest and most versatile fuels in existence. As a low-carbon energy source, propane is recognized by governments around the world for the contribution it can make toward improved indoor and outdoor air quality and reduced greenhouse gas emissions, as evidenced under Canada's *Alternative Fuels Act* and the U.S. *Clean Air Act*. In many applications and regions, propane is among the most attractive energy options for minimizing GHG emissions.

In some Canadian jurisdictions, propane is cleaner than the electricity grid. Propane is not mined like battery materials; it is primarily manufactured from natural gas as a by-product of methane purification.

The propane industry must be responsive to ensure that climate policies accurately reflect the low-carbon characteristics of propane, and as the propane industry looks to improve its carbon intensity, that governments are aware of the role propane can and should play in a low-carbon future.

The CPA is committed to the development of regulations that will result in meaningful emission reductions while providing practical and cost-efficient pathways to compliance.



Methodology

IHS Markit estimated the GHG intensity of three of the most likely value chains of Canadian propane. They worked with the CPA to identify a representative year and pathway for propane from initial production in Western Canada through various stages of processing and transportation to Fort Saskatchewan, Alberta and Sarnia, Ontario. Components of the methodology include:

- Focus on propane sourced from natural gas processing/fractionation facilities, as that accounts for 92%-93% of total propane produced in Canada.
- Identification of the Montney as the most representative supply of new or incremental propane.
- An assumption that all propane is combusted for its end use.
- The IHS Markit / S&P Global estimates of the GHG emissions intensity of Canadian propane are -4% to +1% when compared to the ECCC Clean Fuel Regulations estimate.

Volumes for the three pathways are estimated based on the propane demand each route would serve with the majority of propane demand in the west

There are three primary pathways that were modelled for propane from the wellhead in Western Canada to key market hubs across Canada.

Natural gas production from the wellhead in the Montney is processed at field gas processing plants to separate natural gas liquids (NGL) from natural gas and water. This raw NGL is transported to Fort Saskatchewan, Alberta for further processing and three potential pathways to market:

Pathway 1: NGL stream is completely fractionated, and propane is marketed in Western Canada.
Pathway 2: NGL stream is completely fractionated, and propane is transferred by railcar to be marketed in Eastern Canada.
Pathway 3: NGL stream is partially fractionated, and the remaining NGL mix (predominately C3/C4 and some C5+) is transferred by Enbridge's pipeline to Sarnia, Ontario for further fractionation. Propane is then marketed in Eastern Canada.

GHG emission intensities of Canadian Propane (gCO_2e / MJ HHV)

Pathway	Pathway Share	Drilling & Completions	Upstream Production	Gas processing	Fractionation	Transport	End use	Total	% difference
Pathway#1 (Propane to western Cdn market hub)	77%	0.3	2.5	4.5	1.8	1.7	61	71	-4%
Pathway #2 (Propane to Eastern Cdn market hub)	2%	0.3	2.5	4.5	1.8	3.0	61	73	-2%
Pathway #3 (NGL to Sarnia for fractionation)	21%	0.3	2.5	4.5	1.8	5.0	61	75	1%
Canadian Propane	**100%**	**0.3**	**2.5**	**4.5**	**1.8**	**2.4**	**61**	**72**	**-3%**
ECCC Canadian Propane				**13**			**61**	**74**	

Note: ECCC value for Canadian propane is from CFR specifications for Fuel Life Cycle Assessment (LCA) Model Carbon Intensity (CI) calculations. Direct comparisons of life-cycle analyses are complicated due to differences in estimation methodologies. The S&P Global / IHS Markit values in the table have been adjusted to support a comparison to the ECCC value, however differences in the basis of estimation may remain
Source: IHS Markit, ECCC

Propane is ENERGY FOR ALL

Propane is one of the cleanest and most versatile energy sources in existence. Canadian propane is a low-carbon, affordable, reliable and versatile energy source that is safe and abundantly available. As Canada seeks to reduce its emissions, it must consider all energy options. The expanded use of low-carbon propane – which is market-ready and requires minimal capital investments – is an important part of that effort.

About 93% of Canadian propane is a by-product of natural gas production. However, unlike natural gas, propane contains virtually no methane and is not considered a greenhouse gas prior to combustion. If released, propane does not cause harm to land, air or water, rather it will dissipate into any light breeze. It is used daily by hundreds of thousands of Canadians in such applications as heating for homes and businesses, cooking, transportation, agriculture, construction and mining. Propane is also recognized for its low emissions and environmental impact by *Canada's Alternative Fuels Act* and by using propane instead of traditional fuels like gasoline, diesel and fuel oil, Canadians can lower their environmental impact with an energy source that is available now.