

CLIMATE CHANGE



Overview

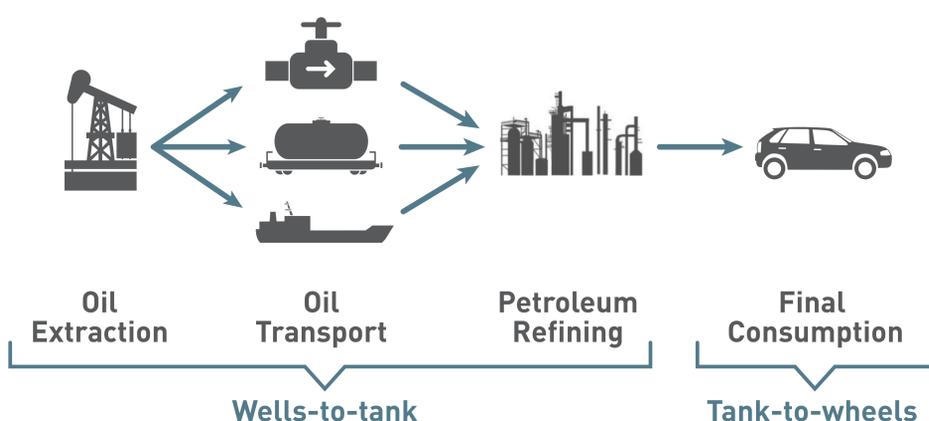
During the Ontario Energy Board's public consultations in 2014, several stakeholders expressed concerns that approval of the Energy East project would lead to greater greenhouse gas (GHG) emissions. As a result, the OEB wishes to advise the Ministry of Energy on how the project is likely to affect GHG emissions. The OEB has retained Navius Research Inc. to estimate how the approval of Energy East would affect GHG emissions. Navius specializes in the analysis of how government policy or energy decisions affect GHG emissions.

Who are we?

Navius Research, Inc is a consulting firm that specializes in estimating the greenhouse gas impact of government policy and energy decisions. For more information on Navius, please see www.NaviusResearch.com or contact Jotham Peters at Jotham@NaviusResearch.com.



Major Sources of GHG Emissions in Oil Markets



How is the project likely to affect emissions upstream from the pipeline (e.g., extraction from the oil sands)?

» The approval of the Energy East project could increase oil extraction in Western Canada, leading to greater emissions. Pipelines offer lower costs of transporting oil relative to rail. Lower costs for transport translate to higher prices for oil in Western Canada, encouraging investment in the oil sector (particularly the oil sands).

While building and operating a pipeline will emit GHGs, the impact upstream or down-stream from the pipeline is likely to be more important.



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How is the project likely to affect emissions from oil transportation?

» Greater oil transport through the Energy East pipeline will increase emissions related to pipeline operation. However, greater pipeline transport may reduce the amount of oil transported by rail, reducing these emissions.

How is the project likely to affect emissions downstream from the pipeline?

The pipeline could affect:

» **Other global oil producers:** Any increase in oil extraction from the Western Canada would lead to a small but noticeable reduction in the average global price for oil. In turn, extraction from other global resources and associated emissions could decline.

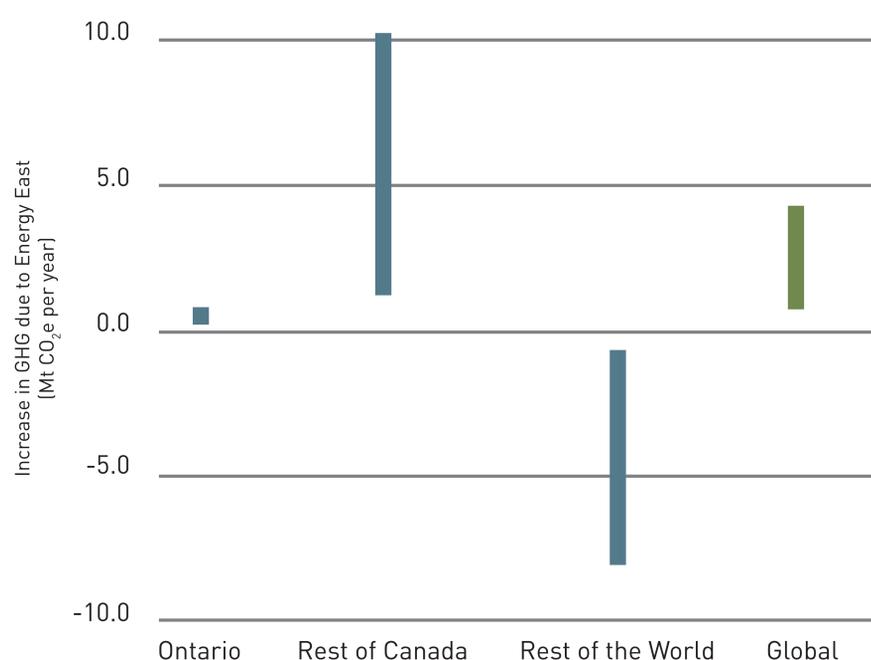
» **Petroleum refiners:** Crude oil must be refined before it can be consumed. If the total global supply of crude oil increases with the project's approval, refining activity and associated emissions would increase. Additionally, bitumen (i.e., oil extracted from the oil sands) is more emissions intensive to refine relative to other grades of crude oil.

» **Final consumption:** Approximately 85% of emissions from the global oil market occur during the final consumption of refined petroleum products (e.g., gasoline). If the project leads to a net increase in the global supply of refined products, it would increase emissions from final consumption.

Preliminary Assessment

This analysis uses the OILTRANS model of the global oil market to offer insight into how the market will evolve until 2035. The analysis estimates how approving the Energy East project would affect emissions in Ontario, the rest of Canada and the rest of the world. The project's approval was assessed under several scenarios that vary how the global oil market will evolve from today until 2035. All results are reported in annual terms in 2035.

Figure 2: Estimated Increase in GHGs due to Energy East from "Well-to-tank" by location in 2035



Ontario

Ontario Energy Board Commission de l'énergie de l'Ontario

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1. The impact in Ontario is likely to be minimal.

The main new source of emissions is from the operation of the pipeline. In 2035, emissions in Ontario are higher by between 0.2 and 0.6 million tonnes (Mt) of carbon dioxide or equivalent (CO₂e) due to the project's approval. For context, Ontario's total emissions were 167 Mt in 2012, and this represents a minimal increase in Ontario's total emissions (less than 0.4%).

2. Energy East will likely increase emissions from “well-to-tank” in the rest of Canada, but the impact is likely to be relatively modest.

Emissions in the rest of Canada increase by between 1.2 and 10.2 Mt CO₂e. The increase occurs from two sources:

» **Oil Sands:** The approval of the pipeline leads to greater activity from the oil sands.

» **Refineries in Québec and New Brunswick:** The project would lead to greater deliveries of bitumen to refineries in these provinces, which are more emissions intensive to refine relative to other grades of crude oil.

Although emissions increase in the rest of Canada due to the project's approval, the increase is modest. While the pipeline would increase activity in the oil sands, the pipeline extracted regardless of the pipeline's approval and transported by rail.

3. The increase in Canadian GHG emissions from “well-to-tank” are mostly offset by a decline in the rest of the world.

While emissions increase in Canada with the project's approval, emissions decline in the rest of the world. In 2035, emissions in the rest of the world are lower by between 0.7 and 8.1 Mt due to the project. The impact in the rest of the world is the flip side of the impact in Canada:

- » Greater supply from the oil sands is likely to reduce supply from other global sources.
- » Greater refining of bitumen in Canada is likely to reduce bitumen refined in the rest of the world.

4. The approval of Energy East would increase global emissions from final consumption (“tank-to-wheels”). All of this impact would occur outside of Canada.

The approval of TransCanada's Energy East project would likely increase the global supply of oil, increasing the amount of refined products to be consumed. However, the entire increase would occur outside Canada (as emissions from final consumption decline slightly in Canada).

5. The range in the results is due to uncertainties in how the global oil market evolves. The likely impact on GHG emissions is lower if:



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» Other pipeline projects are approved. Energy East is one of several pipeline projects proposed from Western Canada. If these other projects are approved, the incremental impact of Energy East would be smaller.

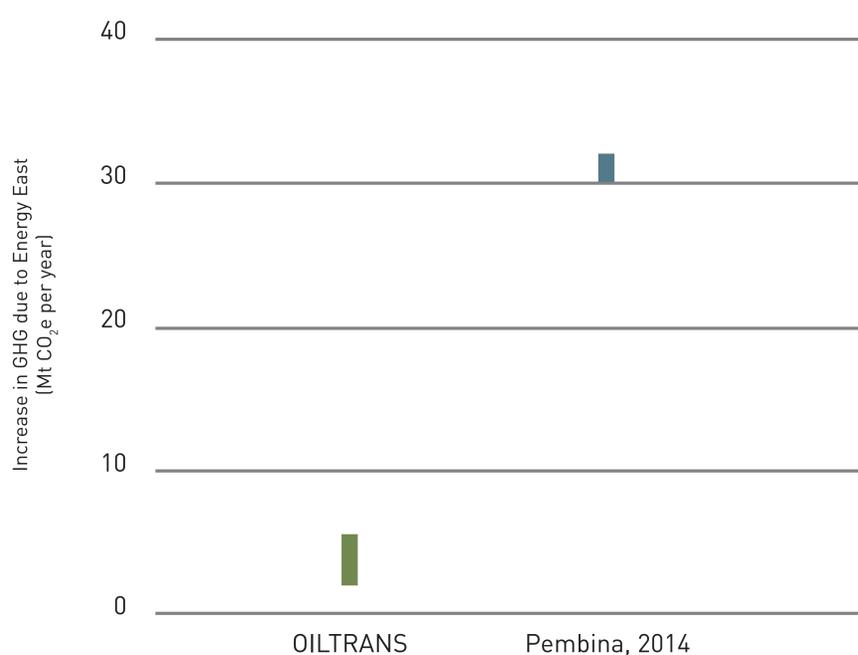
» The consumption of refined petroleum products is less sensitive to price. In general, the consumption of refined petroleum products increases if prices decline. However, the extent to which this occurs is uncertain.

How do these results compare to other research?

To date, only one other study has estimated the GHG impact from the Energy East project. The Pembina Institute (2014) estimated that the impact would be between 30 and 32 Mt CO₂e per year.¹ This is significantly greater than the impact shown here. Although there are several differences between ours and Pembina's analysis, most of the difference is attributed to an assumption about the availability of rail.

Pembina's analysis assumes that pipelines are the only way to transport oil from Western Canada. Therefore, a one barrel increase in pipeline capacity leads to a one barrel increase in oil production. In contrast, this analysis assumes oil can be transported by rail if it is economic. Therefore, the pipeline may be partially filled with oil that would have been extracted anyway and shipped by rail.

Figure 3: Comparison to other research – Estimated Global Increase in GHGs due to Energy East from “Well-to-tank” in 2035



Experience in Alberta and other jurisdictions indicate that rail is likely to be available, if it is economic. The Canadian Association of Petroleum Producers estimates that Alberta already has 1,000 thousand barrels per day of rail shipping capacity (most of which was added since 2013).² For context, the capacity for the Energy East pipeline would be 1,100 thousand barrels per day.

¹ Flanagan E, 2014, "Climate implications of the proposed Energy East pipeline", Pembina Institute, available from: <http://www.pembina.org/pub/2519>, accessed November 2014.

² Canadian Association of Petroleum Producers, 2014, "Crude oil: Forecast, markets & transportation", available from: www.capp.ca; accessed November 2014.



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