

**BACKGROUND:** Canada is the fifth largest oil producer in the world, accounting for 4.8 percent of world production in 2016, ranking behind the US (13.4 percent). Canada's proved reserves, total 171.5 billion barrels or 10 percent of the world's share of proved reserves, yet we continue to import oil. In 2016, Canada imported 607 thousand barrels per day into the eastern refinery market.

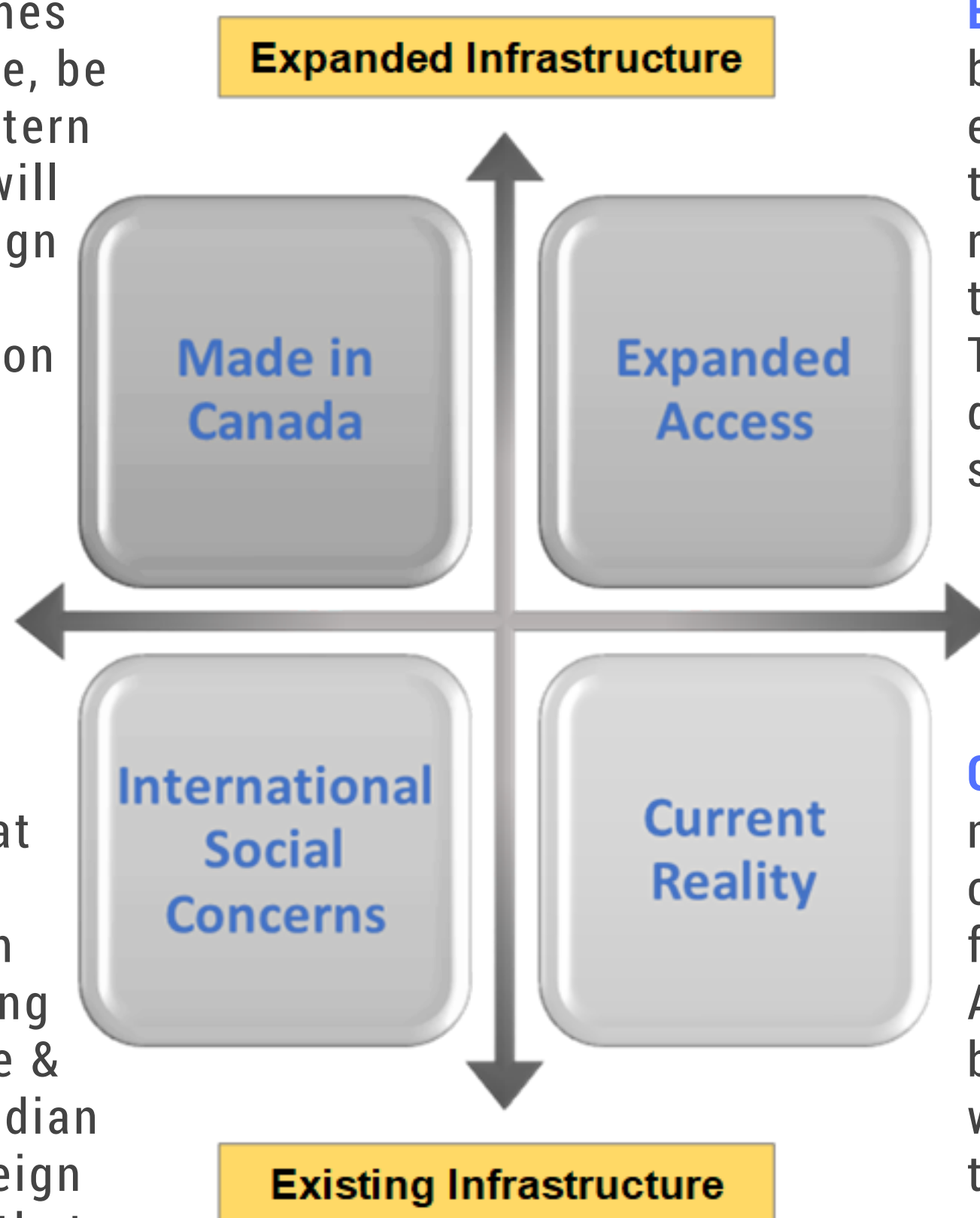
**STUDY SCOPE:**

Analyze the potential substitution, complete or partial, of imported foreign oil in the central and eastern Canadian refinery market with a domestically sourced oil supply and provide a cost and emissions comparison of four potential scenarios as compared to a base case.

**THE FOUR SCENARIOS**

**Made in Canada** assumes that all Canadian crude, be it from western or eastern parts of the country, will substitute for all foreign imported crude oil via expanded transportation infrastructure.

**Expanded Access** is a market-based approach. Western & eastern Canadian crude oil is transported to central & eastern refineries via an expanded transportation infrastructure. This scenario allows for more domestic volumes to be substituted economically.



**International Social Concerns** assumes that crude oil will be transported to eastern markets via the existing pipeline infrastructure & rail. Assumption: Canadian crude will replace foreign crude from countries that have generated international concern regarding their treatment of citizens or the environment.

**Current Reality** adopts a market-based approach, optimizing for cost of feedstock and emissions. Assumption: Crude oil can be transported from western & eastern Canada to eastern Canadian refineries via existing infrastructure.

**THE BASE CASE:**

- Provides a snapshot of crude flows in 2016, representing the reconstruction of current flows (domestic and imported feedstock supply)
- Explores refinery technologies and existing and potential transportation routes for western and eastern Canadian oil to central and eastern refineries, as used in 2016.

**ASSUMPTIONS:**

The study is meant to provide a snapshot of crude flows in 2016, representing the reconstruction of current flows (domestic and imported feedstock supply) and explores refinery technologies and existing and potential transportation routes for western & eastern Canadian oil to central and eastern refineries, as used in 2016.

Data was incomplete due to missing or suppressed statistics. CERI made the following assumptions:

- If crude brands of imported oil are not certain per refinery from an export country, the most abundant brands available in the export country were taken
- If there is no certainty of how crude oil is supplied per refinery from western Canada, an assumption was made based on the distances from the western crude sources, railway network and other available information.

## KEY STUDY FINDINGS

Canadian refineries have the opportunity to purchase domestic crude oil supply today and realize potential cost savings.

In ALL scenarios, the substitution of Canadian crude oil for imported oil reduces overall global CO2 emissions compared to the base case.

Cost savings range from \$23 million in the Made in Canada scenario to \$317 million in the Expanded Access scenario. Both scenarios call for a new pipeline.

In some cases, Canadian emissions increase, but overall emissions which are linked to climate change decrease.

## KEY CONCLUSIONS UNDER THE FOUR SCENARIOS

Category		Expanded Infrastructure		Existing Infrastructure	
		Made in Canada	Expanded Access	Current Reality	International Social Concerns
Flows	Additional western Canadian supply (Mbpd)	424	248	120	123
	Additional eastern Canadian supply (Mbpd)	177	96	160	177
	Total additional Canadian crude (Mbpd)	601	344	280	300
	Substituted foreign oil (%)	100%	57%	47%	50%
Costs	Annual Cost of feedstock (\$ million)	-23	-317	-210	+79
Emissions	Emissions (million tones CO2eq per year)	-2.2	-2.0	-2.0	-2.8
	Change of emissions (%)	-6.2%	-5.7%	-5.7%	-7.9%

### UPCOMING STUDIES AND EVENTS:

A COMPREHENSIVE GUIDE TO ELECTRICITY GENERATION OPTIONS IN CANADA (FEBRUARY 2018)

ECONOMIC IMPACTS AND MARKET CHALLENGES FOR THE METHANE TO DERIVATIVES PETROCHEMICAL SUB-SECTOR (FEBRUARY 2018)

CERI 2018 PETROCHEMICAL CONFERENCE - JUNE 10-12 - KANANASKIS, ALBERTA, CANADA