A REVIEW OF THE FAILED THE ENERGY EAST PROJECT

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The Energy East and Eastern Mainline Projects (referred to in this paper as 'Energy East'), was a project proposed by Trans Canada Pipelines Limited (TCPL) in 2014. This proposal would have seen the development of a pipeline stretching from Alberta to New Brunswick. With a total length of 4600 kilometres (km), Energy East would have provided up to 1.1 million barrels per day of crude oil, including diluted bitumen (dilbit), from Alberta, Saskatchewan and North Dakota to Atlantic refiners and offshore markets (Cattaneo, 2016).

The project raised a number of political, environmental and social questions, many of which have impacted the status of the project and TCPL's decision to withdraw their development application in 2017 (TransCanada, 2017).

Energy East was a nation building concept, proposing to connect Canada's vast, relatively inexpensive oil reserves with its refineries, and global markets. The project was incredibly ambitious. It would have been the longest pipeline in North America, and required the repurposing of one of the TCPL Mainline natural gas transmission lines. This initiative required alignment among a number of stakeholders within industry, local communities, all levels of government, and the 180 First Nations impacted by the project right-of-way (The Council of Canadians, 2013). Energy East's repealed status has led to debate on whether or not a pan-Canadian pipeline project may be possible in the future. This paper considers the background of the project, the many factors that led to its cancellation, why it was and continues to be needed, and how a similar project might succeed in the future.

Energy East: Background and why it was important to Canada

The 15.7 billion Canadian dollar (CAD) Energy East project was a 1.1 million barrel per day capacity pipeline—the longest of five proposed projects that included the Trans Mountain expansion, Northern Gateway, Keystone XL and Enbridge's Line 3 replacement (Vamburkar, 2017). Beginning in Hardisty, Alberta, its terminus in Saint John, New Brunswick, would provide access to an ice-free deep-water marine terminal allowing for trade with international markets. The project called for the repurposing of 3000 km of underutilised gas pipeline, and would require new pipelines to be built through parts of Alberta, Manitoba, Ontario, Quebec and New Brunswick (Figure 1).

Figure 1: Energy East proposed route and existing infrastructure (Cattaneo, 2016).

At the time of the project's conception (circa 2011), there was a rapidly narrowing difference between pipeline egress capacity out of Alberta, and the growing amount of crude available for export (see Figure 2; Cattaneo, 2016). The lack of infrastructure to facilitate the export of western

Canadian crude had a detrimental impact on the price that could be obtained, leading to a growing differential between Canadian crude and the global seaborne market (Brent) price. At the time of consideration, all existing pipelines with the exception of Trans Mountain served only the Canadian and United States (U.S.) markets. Therefore, a need existed to increase export capacity from the Western Canada Sedimentary Basin (WCSB) to diversified markets.

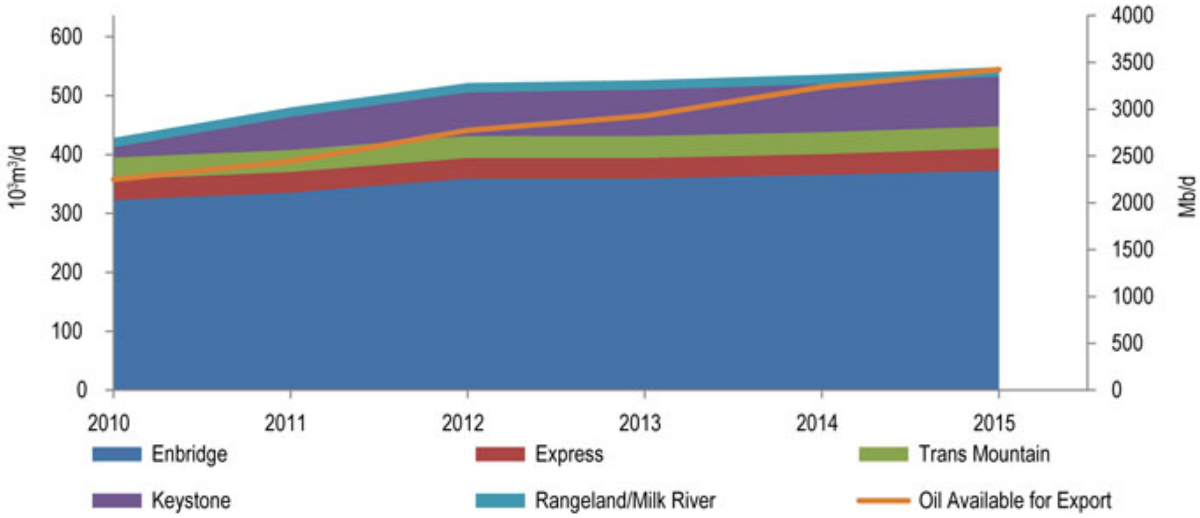

Figure 2: WCSB pipeline takeaway capacity and supply available for export (orange line) up to 2015 (Government of Canada, 2017).

While western Canada producers were selling into the U.S., eastern Canadian refiners were paying a premium to receive foreign seaborne shipments from Middle Eastern, European and South American producers. The Energy East project would allow western Canadian crude to reach these refineries and obtain tidewater access to compete with these markets.

After extensive planning by the Irving refining corporation, TransCanada announced its Energy East proposal on August 6, 2013.

Project Benefits

Energy East would have added 35 billion CAD (quoted in 2013) to Canada's gross domestic product (GDP) over the 40 year lifespan of the project (The Canadian Press, 2013). Economic beneficiaries of the project can be divided into the following categories:

- Job creation during the construction phase and the resulting provincial taxes;
- Tariffs, electricity sales and job creation during operation of the pipeline as wells as resulting provincial income;
- Employment and training for Aboriginal groups;
- Higher revenues for oil producers and increased royalties to provinces supplying the pipeline;
- Lower feedstock costs to Canadian refiners in eastern provinces;
- Canadian consumer benefit from refined products in eastern markets;
- Increased tax revenue to the Government of Canada; and,
- TCPL benefit of developing and operating the pipeline.

Provincial Benefactors

Provinces and Aboriginal groups stood gain through the addition of over 10,000 jobs during construction, primarily in Alberta, Ontario, Quebec, and New Brunswick, where new sections of pipe would be required. 36% of these positions would be required in Quebec, and 23% in Ontario (The

Canadian Press, 2013). Once in operation, 1,081 full time jobs would be added on an ongoing basis across the country (ibid, 2013).

Ontario and Quebec were forecast to have seen their GDP numbers increase by 2.7 billion CAD and 3.1 billion CAD during construction, and 10.3 billion CAD and 3.2 billion CAD respectively, during operation. Revenues during pipeline operation would have been largely derived from the electricity sales required for pumping stations (The Canadian Press, 2013). New Brunswick's GDP stood to gain 1.2 billion CAD during construction, and 1.6 billion CAD over the life of the project, while Alberta would have received a GDP increase of 1.7 billion CAD during construction, and 6.1 billion CAD over the life of the project (The Canadian Press, 2013).

Provinces where oil producers operate also stood to benefit from the increased royalties payments resulting from higher production and crude prices.

Communities along existing oil transportation corridors would also benefit from the environmental and safety associated risk reduction that were to be attained through the displacement of rail borne crude shipments. For example, a study by the Fraser Institute found that rail incidents occurred at a frequency of 0.227 per million barrels of crude transported, while the frequency of incidents associated with pipelines was far lower at 0.049 per million barrels of crude transported (Green, 2015). This is noteworthy as the 2013 Lac Magantic tragedy brought into question the safety and long term effectiveness of transporting crude by rail transport (Judd, 2013).

East Coast Refiners

In 2013, refineries in Quebec and Atlantic Canada imported more than 660,000 barrels of oil per day, of which 15 % was sourced from the U.S. (Tertzakian, 2014). While this paradigm has shifted somewhat with the reversal of the Line 9B pipeline (which allows Alberta sourced crude to more readily supply Montreal refiners), higher supply costs still plague Atlantic refineries (CBC News, 2015). Energy East would make western Canada crude more accessible to Suncor's Montreal refinery, Valero's Quebec City refinery and Irving's Saint John refinery (Magder, 2016). Irving indicated that, as part of the Energy East project, it would partner with Trans Canada for the construction of the Canaport Energy East marine terminal near Saint John in order to facilitate exports to international markets (Cattaneo, 2016).

Although eastern refiners are not presently equipped to handle the Western Canadian Select (WCS) product, most of the refiners, including potential international customers, have indicated that they would seek to incorporate the required modifications to be able to refine heavier crude grades once the Energy East pipeline was approved.

Support and Opposition

In 2013, the federal government expressed support for the Energy East project, claiming that it would be a "pan-Canadian solution" that would see the entire country benefit from its energy products, and would "enhance our own energy security" (Whittington, 2013). At the time, critics of the Harper administration argued that it was too supportive of pipeline construction, and that the C-38 omnibus bill passed in 2012 gave "the power to give the go-ahead to pipelines and other major energy projects regardless of the conclusions of recommendations coming from regulatory hearings" (Patterson, 2013).

On November 4, 2015, the Liberal Party of Canada formed federal government after campaigning that the National Energy Board (NEB) would be reformed as it had become "politicised" under the former government, resulting in the destruction of public trust. Although the party did not directly oppose Energy East, its support of the competing Trans Mountain pipeline was suspected to derive from the perception that Energy East posed significant political risk in Quebec and Ontario—where they benefit from a large support base (Cattaneo, 2017).

In Quebec, criticisms of Energy East included concerns over the environment, contamination of drinking water supplies, and insufficient project application detailed related to major river crossings (Environmental Defence, 2017). Provincial supporters of the project included Alberta, Saskatchewan and New Brunswick. First Nations groups demonstrated a mix of supporters and detractors; however, it was reported that the majority of Quebec First Nations were opposed to the project citing concerns of potential spill repercussions and climate change impacts (The Canadian Press, 2016).

In the project's infancy, opposition in Quebec lead to the consideration of alternative route options. One such option was the reversal of the pipeline between Montreal and Portland, Maine, where a marine terminal could be located. Opposition was observed at the local level in Maine, once again citing concerns over "tar oil" transportation; however, support was voiced from those who stood to benefit economically if the project eventuated (Fishell, 2014).

Parts of the project were scrapped soon after it was announced. One example included the plan to build a marine terminal at Cacouna, Quebec. When explaining why they had reconsidered this option, Trans Canada cited concerns over a beluga whale population, which inhabits the area near the proposed site (Posadzki, 2015).

Opposition to the project was also received from Spectra Energy (later to become Enbridge), and Enbridge itself. Both companies are dependent on the TCPL Mainline to supply their natural gas distribution networks in Ontario and Quebec. It was claimed that the removal of 40% of the Mainline's gas transmission capacity would result in their inability to service existing customers. TCPL refuted this claim, stating that existing clients would continue to be serviced, and could even benefit from a reduction in their gas prices (Lewis, 2013). This was of enough concern that the Ontario Government instructed the Ontario Energy Board (OEB) to compile a report on Energy East to help inform the government's position on the project (Ontario Energy Board, 2015).

The Economic Case for Energy East

Western Canada Crude and Current Markets

The economics of the Energy East project were critical to its justification, and as such, the commodity pricing implications to western Canada crude is evaluated as part of this study. Canadian oil production, which today mainly consists heavy oil from the oil sands region (see Figure **3**), is traded at the WCS benchmark price. WCS trades at a discount relative to the North American crude benchmark (West Texas Intermediate, or WTI) due to the lower refining quality of heavy sour blends, as well as infrastructure and transportation bottlenecks, mainly as a result of a lack of pipeline egress capacity. This difference, referred to as the heavy oil differential is exacerbated during times of pipeline transportation outages. This results in crude transport by alternative, more expensive means such as rail. Due to the landlocked nature of the WCS market, it is seldom referenced to the Brent price.

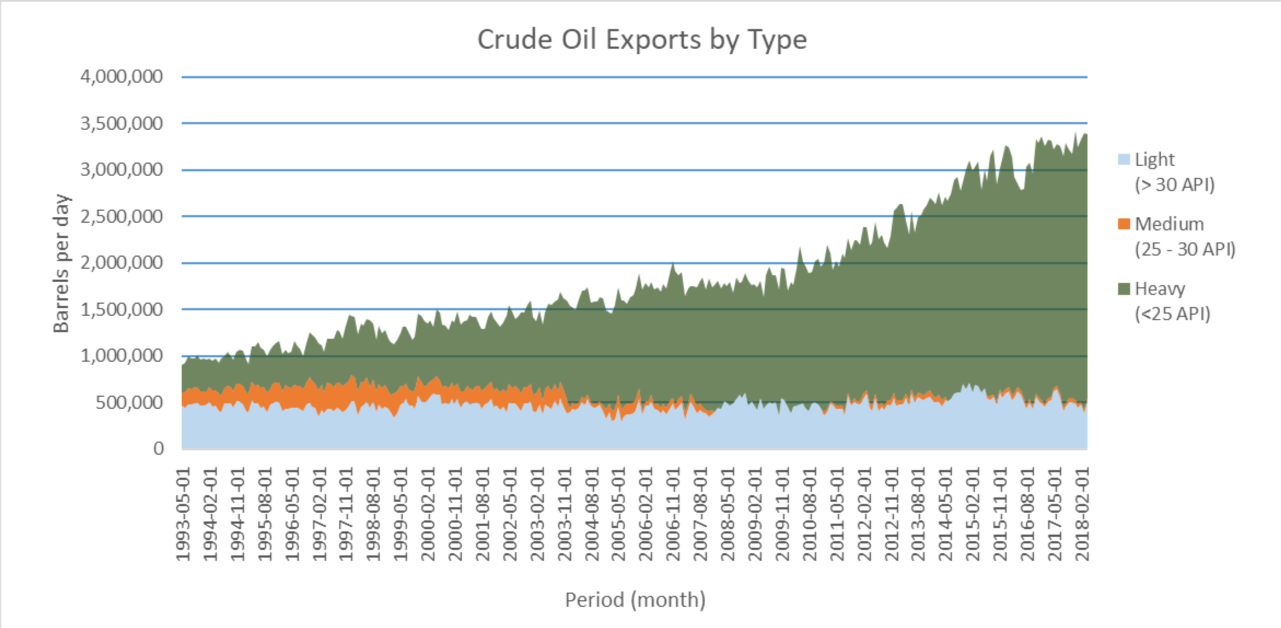

Figure 3: Canadian crude oil production by type from 1993 to 2018 (NEB, 2018).

The majority of Canadian crude exports are shipped to U.S. Gulf Coast refiners. These highly complex refineries are equipped to handle the heavy sour WCS crude, and have a preference for this cheaper, lower quality, but higher energy feedstock, as it allows for improved refining margins (Oil Sands Magazine, 2018). External factors can impact the price of WCS such as the availability and price of competing heavy oil supplies such as the Mexican Maya and Venezuelan blends, U.S. Gulf Coast refinery shutdowns and volatility of the WTI benchmark price.

Limitations of the WTI Benchmark

Not only does a great proportion of Canadian production trade at a discount to WTI, WTI itself is discounted relative to the Brent global benchmark. Until 2016, the U.S. was the world's largest importer of crude oil. This exposed the U.S. to Brent pricing, resulting in little between WTI and Brent pricing (Meng, 2016). However, growing U.S. production and limited pipeline capacity to the Gulf of Mexico has resulted in a WTI differential relative to Brent (RBC Economics, 2013). Figure **4** shows the price difference between Brent and WTI since 2004, which has been as wide as 27 United States Dollars (USD) in 2011. This price differential was the result of the shale oil supplied glut of crude. WTI price is also subject to changes in U.S. policy. One significant example of U.S. policy implications on WTI price was the lifting of the ban on U.S. crude exports in December 2015. This policy change resulted in a reduction of the differential between WTI and Brent from over 25 USD to under 11 USD (The Economist, 2015).

For western Canada producers, pipeline access to tidewater is the only solution to diversify from the North America market. Access to international markets from the east coast could change the benchmark in which WCS is referenced from WTI to Brent.

Figure 4: Candle stick chart displaying the Brent to WTI pricing differential by year. Higher Brent pricing is displayed on the vertical axis (TradingView, 2018).

WCS quality related discount

Aside from supply and demand forces, the reference benchmark WTI and Brent crudes are higher quality than WCS, which requires more intensive refining at complex facilities. For this reason, WCS will always trade at a minimum discount owing to its lower quality. This trade discount is estimated at approximately -5 USD relative to WTI (Drager, 2014). This discount is exacerbated as oil prices increase, and is an important consideration, when evaluating the cost of the WCS to WTI differential to Canadian producers over time (Bacon & Tordo, 2005).

Energy East Tolls and Diversified Market Options

The proposed cost of transporting crude by Energy East was relatively high compared to the existing tolls charged on Keystone. Ten year committed contracts were listed at 9.28 CAD per barrel for delivery from Hardisty to Saint John (Energy East Pipeline Ltd, 2016). The cost of sea borne transportation to Europe was estimated at 1.50 USD, and 3 to 4 USD to India (Leach, 2013). For comparison, pipeline tolls to Cushing, Oklahoma, range between 2.46 and 2.96 USD for heavy crude (Eisele, 2018). Despite the higher tolls, TCPL was able to fully subscribe transportation service agreements in 2014 (Energy East Pipeline Ltd, 2016). If constructed, the cost of delivery to India via Energy East would have been lower than crude by rail to the Gulf Coast, which was estimated to be 20 CAD per barrel in 2018 (Investments, 2018; Healing, 2018). Despite these higher transportation costs, a lack of alternatives has resulted in an increase in crude by rail shipments (Figure **5**).

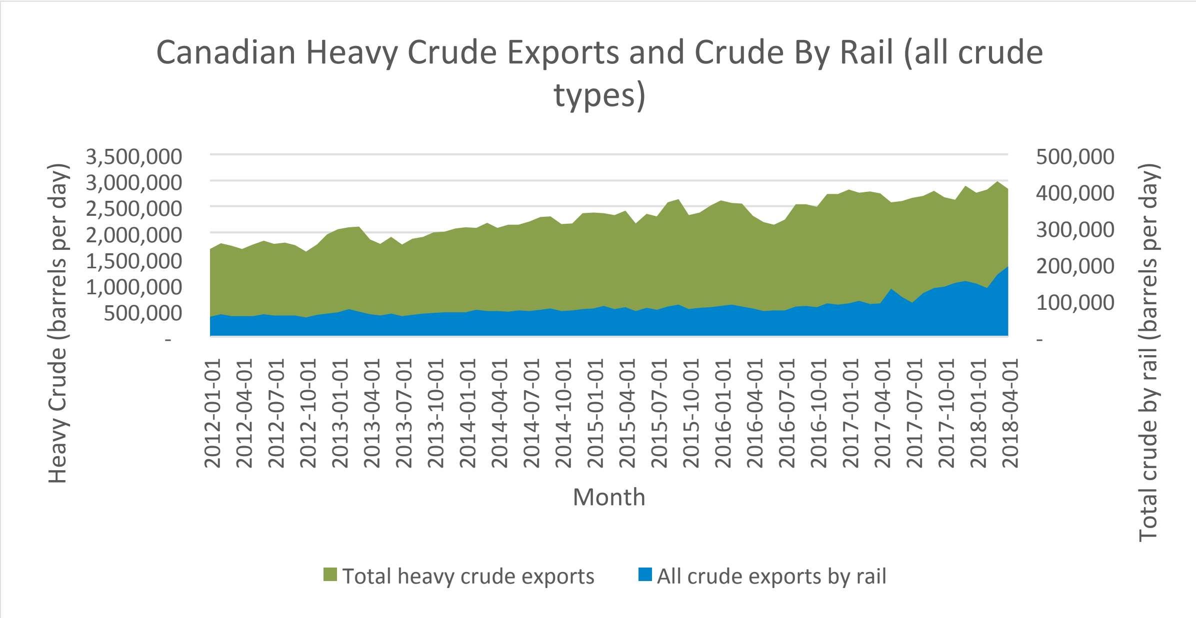

Figure 5: Canadian heavy crude exports (left axis) and total crude by rail shipments (right axis) (AER, 2018; NEB, 2018). Both have been growing since January 2012.

<u>Key Aspects the Application and Review Process</u>

NEB Review Process

The NEB review process began in 2014 when the Board appointed a review panel. The original panel came under criticism in August 2016, resulting in all three members resigning following the revelation that two of the members had met with former Premier of Quebec and TCPL consultant, Jean Charest (Marandola, 2016).

Following the change of the federal government, a new hearing panel was selected in January of 2017 by National Resources Minister Jim Carr (Tasker, 2016). The new panel promptly voided all decisions made by the previous panel, effectively restarting the review process (National Energy Board, 2017). It also incorporated significant changes under which the project would be evaluated. One of these changes was the implementation of downstream carbon emissions and the larger question related to the effect of meeting GHG emission targets on the financial viability of, and need for the pipeline (Healing, 2017). This was a significant shift from the original requirements under which the TCPL application was submitted (NEB, 2017). The Keystone XL and Trans Mountain expansion projects had received approval under the former NEB assessment criteria, and due to the dramatic shift in assessment on Energy East, the change was widely interpreted as being reflective of the Government of Canada's indirect opposition to the project.

Key Factors that Contributed to TransCanada's Decision to Withdraw its Application

Major factors that played a part in TransCanada's decision to withdraw its Energy East application include negative sentiment among key political factions along the proposed route, delays incurred by the NEB hearing panels, and subsequent policy changes that were implemented on the Energy East assessment criteria. TCPL, although not directly citing these as the factors in their decision are quoted as saying that they would not proceed with the project "upon a careful review of changed circumstances" (TransCanada, 2017). TransCanada estimated that the failed project cost its shareholders 1 billion CAD (ibid).

Canadian public sentiment towards the Energy East oil export infrastructure was largely focused on the GHG emissions associated with Alberta's oil sands. Additionally, citizens in eastern provinces were concerned by the risk of a diluted bitumen spill, especially in Quebec where the pipeline would have crossed as many as 828 water bodies (Gobeil, 2016).

Congruous timing should not factor into the decision making process of major infrastructure projects like Energy East; however, the project's failure was assisted by the delays incurred during its review. The NEB has indicated that it will not approve additional pipeline capacity while there is existing or approved capacity available (Dachis, 2017). Therefore, it is unlikely the NEB would have approved the combined capacity of Energy East, Keystone, and Trans Mountain. Figure **6** shows that in 2015, the NEB's western Canada oil production growth predictions indicated that Energy East would not be required until 2030 (Poitras, 2018). Had the evaluation of the Energy East application been completed prior to November 29, 2016, when competing projects were approved, it would have served as a contender to these projects. However, the approval of the competing pipelines was likely the last in a series of factors that would ultimately culminate in the project's withdrawal on October 5, 2017.

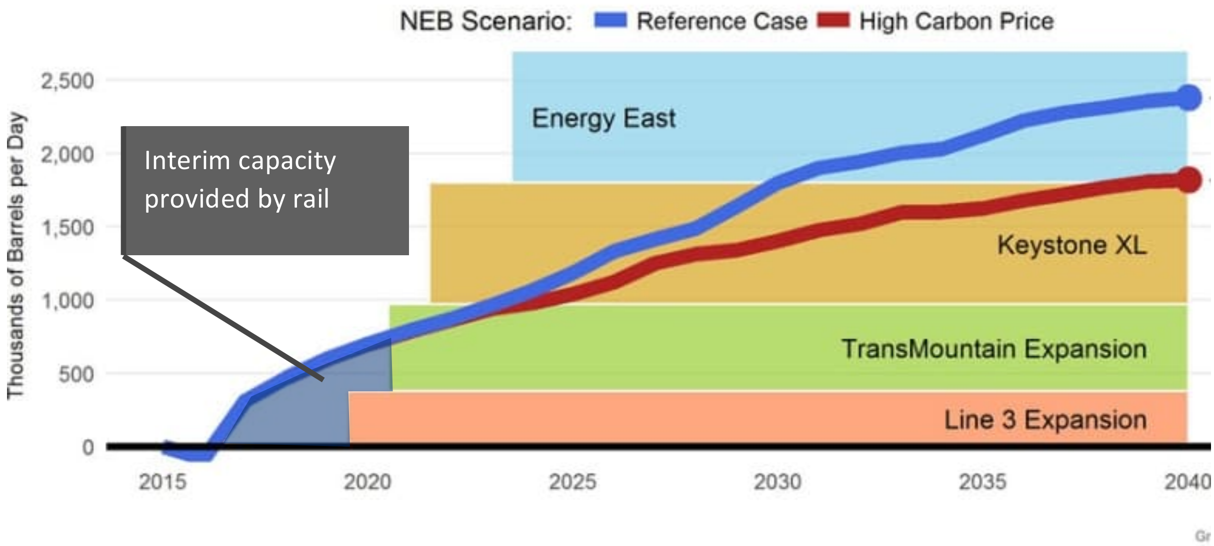

Figure 6: Western Canada oil production growth (2015 to 2040), and pipeline capacity increases with NEB reference carbon pricing scenarios (modified after Poitras, 2018 and NEB - Canada's Energy Future 2017).

Is an Energy East-like Project Possible in the Future?

It is unlikely that the Energy East project proposal will be revived in the near future, and likely not until there is a change in sentiment toward the project at the federal level. The NEB has approved added capacity fulfilling requirements to 2030; however, if one of the approved projects falters, there will be an immediate need for added export capacity.

A future Energy East will also depend on the WTI to Brent differential, as well as the oil price. A widening of the spread, or an elevated commodity price will increase pressure for export capacity to international markets. It is estimated that the WTI to Brent differential needs to be in excess of 6 USD (in favour of Brent pricing) for Energy East to breakeven with Keystone. A holistic approach would incorporate the value associated with the reduction of risk that is afforded by lowering exposure to the WTI benchmark.

Other factors that will impact the likelihood of a future Energy East project include the cost and repurposing portions of the TCPL Mainline. While the gas transmission line is currently underutilized, the completion of upgrades to the NOVA Gas Transmission Ltd. (NGTL) system across the WCSB will likely lead to increased volumes on Mainline. Once this occurs it will become increasingly more complicated to access this infrastructure, resulting in the need for an additional 3000 kilometres of new pipeline. The added cost of this would be a detriment to the economic viability of the project. Should west coast LNG projects proceed or if Marcellus gas fills demand for eastern gas markets, this may once again reduce capacity on the TCPL Mainline, making it available for repurposing.

The impacts of both the Energy East cessation and the turmoil surrounding the Trans Mountain approval, which ultimately required the federal government to purchase the project, means that future applications to construct pipelines in Canada may suffer due to waning support from industry. The estimated 1 billion CAD expense incurred as a result of the failed Energy East application is a testament to the risks of embarking on a major pipeline project in Canada.

Social Considerations

At present, Canadian consumers do not incur a financial cost based on the social, safety, and environmental conditions under which the oil that they use was produced. As a result, oil produced in Canada competes with imported oil on price and quality alone. If financial implications associated with these metrics existed, western Canada oil would have a significant price advantage when compared to foreign imports—much of this derived from conflict regions with poor human rights and environmental performance. In such a scenario, eastern Canada markets would have a higher economic incentive for a pan-Canadian pipeline.

Paradoxically, foreign oil imports that supply Canada's eastern provinces are not subject to the carbon taxes and downstream GHG emission considerations with which the Energy East project and western producers are subjected (Vallée & Michaud, 2017).

The latest NEB review process incorporated the upstream and downstream emissions of the product shipped in the Energy East pipeline. The project therefore inherited the GHG footprint and negative sentiment associated with the oil sands projects that were to supply the crude being transported. While there are higher GHG emissions associated with the extraction of bitumen, most of the GHG emissions relate to the burning of fossil fuels rather than the method with which they are extracted (Figure **7**).

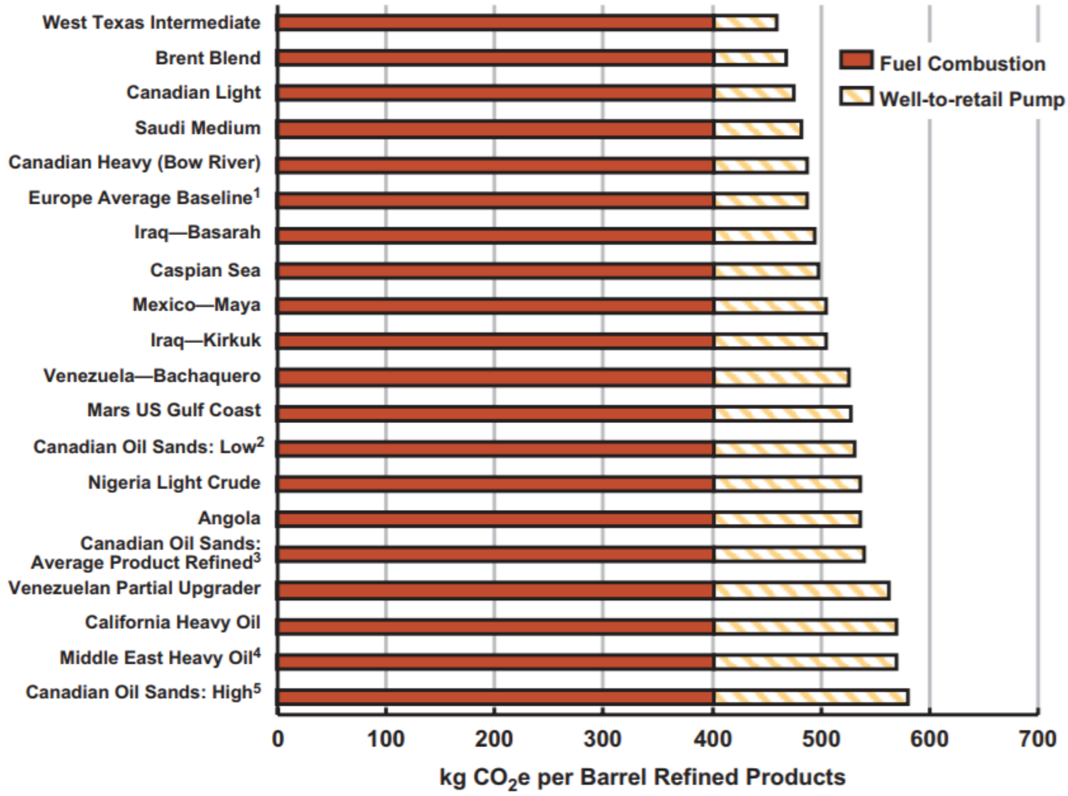

Figure 7: Well to wheels greenhouse gas emissions for oil sands and other crudes (IHS CERA, 2011).

Repercussions of TPCL's Decision to Withdraw its Energy East Application

The Energy East fiasco has fuelled doubt over Canada's reputation as a place for capital investment. It is suspected that TCPL initiated the process under the premise that if the correct proceedings were followed, and that if it was deemed to be in the national interest, the project would be approved. The investment community is unlikely to remember that the approval of three competing pipelines prior to Energy East's review negated the need for the project. Potential investors may also not recognize Energy East as TransCanada's failsafe option should Keystone XL not have proceeded. The legacy of Energy East will likely include NEB delays that resulted in inability of the project to be ranked against competing pipelines, and the fact that the project assessment criteria changed halfway through review, resulting in new and ambiguous requirements for the pipeline's approval.

Opinion and Recommendations

Current and approved pipeline capacity mean there is little requirement for Energy East in the next 10 years. Furthermore, U.S. crude exports and tidewater access provided by the Trans Mountain expansion will reduce the economic drivers behind the WCS and Brent price differential. However, should either of Keystone XL or Trans Mountain fail to be constructed, there will be an urgent need for an additional export pipeline in Canada.

During its review, the Energy East project lacked support from Quebec and Ontario. Had the voting public in these provinces wanted Energy East as much as Alberta, Saskatchewan and New Brunswick, it would almost certainly have been approved. The reluctance in these provinces will need to be addressed prior to any further consideration about an Energy East project.

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Stakeholders, including the public, provinces, and aboriginal groups can become further involved and willing participants if they stand to financially gain from the project. The precedence of Trans Mountain's purchase by federal government shows that ownership by citizens of major infrastructure projects is still possible (Johnson, 2018). Educating citizens, particularly in Ontario and Quebec, as to the financial benefits and the incremental safety improvements of pipelines should be an ongoing process.

The original NEB review panel drew a lot of criticism for their handling of the evaluation of Energy East. As a result, public trust of the assessment of inter-jurisdictional pipeline infrastructure was eroded. Furthermore, the newly appointed panel added ambiguous metrics that made it difficult for TCPL to evaluate its chances of a successful outcome. Future evaluations will need to be done in a manner that is open and transparent with all stakeholders.

Although the addition of upstream and downstream emissions to the Energy East evaluation added significant uncertainty to the evaluation process, it is unlikely that this would have encumbered the successful outcome of the application. While GHG emissions are generally higher for oil sands projects, extraction has only a marginal impact on the lifecycle emissions of hydrocarbons as the majority are produced during combustion by the end user. The NEB's new focus around upstream and downstream emissions should be further clarified to ensure that the evaluation of a pipeline is not misinterpreted as a wider discussion on society's use of hydrocarbons.

Canada should not exempt imported goods from the same standards that it places on manufacturers and producers under its jurisdiction. At the very least, a carbon tax should be applied to crude imports, especially when western Canada producers are liable for this burden. Building off this concept, a metric should also be placed on the Canadian values, including social, safety and environmental considerations. Where foreign goods or commodities are produced more cheaply by circumventing or exploiting these considerations, an entry tax or tariff should be implemented. Under this approach, western Canadian crude—which would not be subjected to the tax—would become more competitive; and therefore, more attractive to consumers in eastern provinces. Until this occurs, there will continue to be little financial incentive for eastern Canada refineries to deviate from crude imported from Venezuela, Nigeria or Azerbaijan.

Should Energy East proceed, the cost of construction will need to be closely monitored. At an estimated 15.7 billion CAD, the resulting $9.28 CAD per barrel toll approaches the limit of the project's viability. Higher priced tolls would reduce the pipeline's impact in offsetting higher cost rail transportation.

Likely the most impactful outcome of the Energy East cancellation is the signal Canada has sent to foreign investors. The federal government complicated the assessment criteria imposed on the project to dissuade the Energy East project from occurring. This will increase the risk associated with investment in future energy infrastructure projects in Canada. The unforeseen ambiguity that was introduced into the review process, and the resulting 1 billion CAD cost associated with the failed application adds to the uncertainty of investing in Canada. Long term, high capital cost utilities such as pipelines are unlikely to provide the required profits to warrant absorbing this added regulatory risk. However, bipartisan commitment from the federal government is required to prevent review conditions from changing once an application has been filed. This agreement could help to facilitate repair the damage done to Canada's image in the global investment community.

Assuming the construction of the approved Line 3, Trans Mountain expansion and Keystone XL pipelines, as well as the increasing oil sands production, discussions should start by 2022 (early scenario) or 2032 (later scenario) for Canada's next inter-jurisdictional pipeline. With the support of the federal government, and communities in Ontario and Quebec, it is not unrealistic to believe that Energy East may become a reality in the future.

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