

Why Canada Needs New Pipeline Capacity to Tidewater

(prepared by Veracity Plus Consulting, July 2016)

Outline of Report

The purpose of this report is to provide the Canadian Energy Pipeline Association (CEPA) with an analysis on the topic of ‘Why Canada Needs New Pipeline Capacity to Tidewater’. The report is organized into 4 sections:

- I. Context
- II. The Facts: Demand, Supply, Pipeline Capacity
- III. Benefits from New Pipeline Capacity
- IV. Conclusions

The bulk of the report is contained in section II, which contains the supporting analysis behind most of the conclusions. .

I. Context

In 2012 and 2013, very wide differentials opened up between the price of western Canadian heavy oil and WTI. Discounts on western Canadian heavy oil were averaging over \$20/barrel during this time and the result was billions in lost revenue to Canadian producers and, by extension, Canadian governments and the Canadian public.

The primary cause of these extreme price discounts was that there was a lack of pipeline capacity out of western Canada to tidewater, resulting in a glut of heavy oil in mid-western US markets.. In this price environment, Canadian oil producers backed a number of large pipeline projects, all of which had the aim of reaching tidewater and which would enable Canadian oil to obtain world prices. The four major projects included Northern Gateway, Keystone XL, the TransMountain Expansion and Energy East.

The discounts have disappeared in the last few years, primarily because of some expansions on the Enbridge system and new connections to the Gulf Coast. This had led some industry critics to argue that there is no need for major new pipelines¹. Some of the arguments that have been made are:

¹ See for example, “Tar Sands: The Myth of Tidewater Access”, Oil Change International, March 2016

1. Demand for western Canadian oil will not be there because: i) the world is moving off oil and; ii) offshore refineries will have a preference for light crude oil and Canadian heavy oil will be discounted.
2. Oil production from western Canada will not grow because prices are low and new oil sands projects will not be economic.
3. There has been enough pipeline capacity built with Enbridge's Southern Access project, Seaway and the Line 9 Reversal.
4. The benefits that the industry provides to Canada are greatly overstated and not worth the risks of building large diameter pipelines.
5. Canada and Alberta should be investing in clean energy, not putting money into a declining sunset industry.

However, the industry is of the view that additional pipeline capacity is still badly needed to ensure market diversification and to ensure that Canadian oil can always access the highest value markets, both today and in the future as production grows. In fact, the Canadian Association of Petroleum Producers (CAPP) released its annual outlook for oil production in mid-June and stated:

"Canada needs more pipelines in all directions to supply growing global needs as well as domestic markets. Less than one per cent of Canada's oil is shipped to markets outside North America. So the case for additional pipelines remains urgent to move Canadian oil to Canadians and to the world."²

Thus, it is clear that the industry believes that new pipeline capacity is urgently needed.

The Canadian public appears to be divided on the question of whether or not new pipeline capacity is needed. The purpose of this report is to outline the reasons why this capacity is still needed and to recommend some key messages for communication with governments and the Canadian public on the need for additional pipeline capacity.

II. The Facts: Demand, Supply, Pipeline Capacity

Critics of the industry allege that there is no need for additional pipeline capacity because neither the demand nor supply will be there, and that there is already enough pipeline capacity in place. Thus, the three key questions in the discussion around the need for new pipeline capacity are:

- 1) Will there be adequate demand for growing western Canadian crude production?
- 2) Will western Canadian crude oil production actually grow?
- 3) Is there already adequate pipeline capacity in place?

² CAPP 2016 Crude Oil Forecast, Markets and Transportation

This section addresses each of these questions in turn.

1. Outlook for the Demand for Western Canadian Oil

The upstream industry's argument that new pipeline capacity is needed that connects supply to tidewater is based on two key premises: first, that world demand for oil will grow; and, second, US oil demand for Canadian oil is declining so Canadian producers need access to overseas markets. We consider each of these arguments in turn.

1.1 World Demand for Oil

Energy demand is primarily driven by population growth and by income growth. More people and people with more money to spend directly translates into increased energy consumption. World population is expected to continue to grow over the coming years and incomes are expected to grow rapidly, especially in Asia. Accordingly, the overall demand for oil in the world is projected to increase by all major independent analysts.

The US Energy Information Agency (EIA) projects that world oil demand will grow by about 27 million barrels a day (mb/d) by 2040, even though it projects that US demand will be flat³. British Petroleum, in its well-respected annual energy outlook, projects that world oil demand will grow by about 20 mb/d by 2035⁴. The International Energy Agency projects that crude oil demand will grow by about 13.0 mb/d by 2040⁵. All three project that petroleum demand will be flat to declining in well-developed economies such as Western Europe, the US and Canada, but that petroleum demand will grow in Asia and other developing economies in South America and Africa.

Fact #1:

Energy demand is driven by growth in population and by rising incomes.

Fact #2:

Demand for oil will rise rapidly in Asia as population and incomes rise.

Petroleum (oil) has two primary uses in world energy markets:

- i. Transportation fuels in road vehicles, jets, and ocean transport
- ii. Chemicals industry applications, including plastics

³ US Energy Information Agency, "International Energy Outlook", May 2016

⁴ BP 2016 Energy Outlook: <https://www.bp.com/content/dam/bp/pdf/energy-economics/energy-outlook-2016/bp-energy-outlook-2016.pdf>

⁵ International Energy Agency, 2015 World Energy Outlook, based on the IEA's reference "New Policies" scenario.

The primary use for oil is in transportation markets. As outlined below, the reality is that it is not easy to substitute away from oil in any of these uses.

Transportation Markets

a. Vehicles (Cars, Trucks, Buses, Vans, Jeeps)

- In 2010, the world reached 1 billion vehicles and now there are approximately 1.25 billion vehicles in the world⁶
- Annual sales of new vehicles in 2015 was almost 90 million, up from 65 million in 1966⁷
- Annual vehicle sales are expected to increase to about 120 million per year by 2035⁸
- The rate of vehicle ownership is increasing rapidly in Asia - it is projected that there will be about 2.4 billion vehicles in the world by 2035⁹
- Almost the entire existing world fleet of vehicles runs on petroleum (diesel and gasoline)
- Almost all vehicles currently under construction are designed to run on petroleum – fewer than 1% of new vehicle sales in 2015 were electric¹⁰
- The average life expectancy of vehicles varies around the world but 15 years is probably a reasonable estimate – therefore, most of the vehicles currently under construction to be sold in the next year or two can be expected to be on the road past 2030.
- The combination of more cars, and more kilometres driven, mainly powered by petroleum, means that the demand for oil for transportation will inevitably increase over the next 15 years.

Fact #3:

The demand for oil for vehicle transportation will rise over the next 20 – 25 years, driven by rising demand in Asia.

b. Aviation

- Jet travel is 100% dependent upon aviation fuel refined from crude oil and there is no indication that any substitutes will become available in the next few decades
- World passenger and freight travel is increasing rapidly
- IATA reports that both world passenger traffic and freight traffic increased by an average of 5.5% per year from 2005 - 2015¹¹

⁶ See Statista: <http://www.statista.com/statistics/281134/number-of-vehicles-in-use-worldwide/>

⁷ See OICA (Organisation Internationale de Constructeurs des Autos, Paris): <http://www.oica.net/category/sales-statistics/>

⁸ See Navigant: <http://www.navigantresearch.com/research/transportation-forecast-light-duty-vehicles>

⁹ See BP's Energy Outlook, 2016 Edition, p. 24-25

¹⁰ See Navigant: <http://www.navigantresearch.com/research/transportation-forecast-light-duty-vehicles>

- Passenger and freight traffic is expected to continue to grow rapidly in Asia. For example, passenger flights increased by 25% in India in 2015 compared to 2014.
- As the rest of the world outside the OECD becomes wealthier and travel becomes more commonplace, the amount of jet-miles flown will increase dramatically, leading to strong growth in the use of aviation fuel over the next 25 years.

Fact #4:

The demand for petroleum for aviation fuel will grow steadily over the next 25 years.

c. Marine Transport

- Ocean transport has been increasing dramatically in recent years as world trade has boomed. World seaborne trade increased by 250% between 1991 and 2014¹².
- Ocean tankers almost exclusively use fuel oil derived from crude oil.
- There are no short term good substitutes for fuel oil, although research and investigation is being carried out into building tankers fueled by LNG or biofuels. However, it is likely that it will be many years before new fuels make significant inroads so it is expected that fuel oil will continue to dominate marine transport for the next few decades.
- The outlook is for marine transport to continue to increase as world trade continues to grow. However, larger and more efficient ships may offset the increase in miles travelled so that the demand for fuel oil is expected to grow only slowly.

Fact #5

- Fuel oil will continue to dominate marine transport for the next few decades.

In summary, transportation worldwide will remain dependent upon oil for many years to come and, as miles driven and miles flown increase, the use of oil for transportation will continue to grow over the next 20 years or so.

¹¹ See for example, <http://www.iata.org/pressroom/pr/Pages/2016-02-04-01.aspx>, International Air Transport Association (IATA)

¹² See: http://unctad.org/en/PublicationsLibrary/rmt2015_en.pdf, figure 1.1 [UNCTAD stands for United Nations Conference for Trade and Development]

The Market for Petrochemicals

Oil is an essential input into the manufacture of petrochemicals, which are in turn inputs into a vast range of products consumed worldwide, including plastics, rubber, fibres such as polyester, resins, and fertilizers, to name a few.

The main sources of inputs to petrochemicals are by-products from petroleum refineries and methane/ethane produced in natural gas processing plants. Since by-products are, by definition, residual products left over from the refining process, refiners will sell them at low prices if required. Thus, to a large extent, the demand for petroleum as a feedstock is guaranteed to match the availability of refinery outputs.

The key points about the petrochemical industry are:

- By-products from oil refining are a key input in the petrochemical industry
- The demand for petrochemical products – plastics, synthetic fibres, fertilizers, resins – will continue to grow rapidly as worldwide population and income increases
- The IEA projects that world demand for oil for petrochemicals production will increase by almost 2 mb/d over the next five years¹³.
- The demand for oil as an input into petrochemicals is expected to grow steadily, while recognizing that there may be more rapid increase in the use of natural gas as an input

Fact #6:

- The world is constantly increasing consumption of petrochemicals products – plastics, synthetic fibres, fertilizers, resins – and oil is a key input into petrochemical products

Conclusion #1 - World Demand for Oil

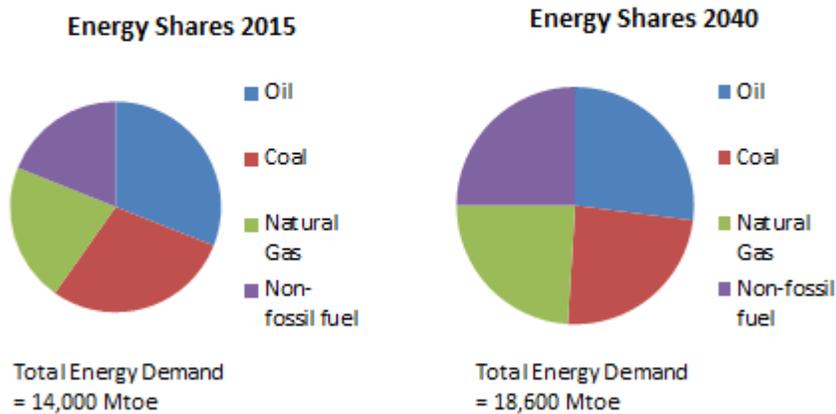
- World demand for oil will increase over the next 25 years, driven by increasing population and incomes, particularly in Asia. More people who can afford a better quality of life will result in growing vehicle sales, growing jet fuel demand, and growth in the consumption of petrochemical products (plastics, synthetic fibres, resins, etc.)

¹³ See: <http://www.icis.com/resources/news/2016/02/22/9972119/petrochemical-demand-for-oil-set-to-hold-through-to-2021-iea/>

It is important to note that, while total demand for oil will increase, oil's share of total energy consumption will fall while the use of renewables increases rapidly. This is illustrated in Chart One below, which is adapted from the IEA's 2015 World Energy Outlook.

Chart One

World Energy Shares 2015 and 2040*



* Adapted from IEA's 2015 World Energy Outlook

In its reference case the IEA is projecting that world energy demand will grow by about 33% between 2015 and 2040, driven mainly by increasing population and incomes. Demand for oil is projected to grow by about 13 mb/d, but oil's share of total energy use will fall from 31% to 27%. As discussed above, the IEA also sees oil continuing to dominate transportation markets.

The IEA projects that the use of natural gas will grow rapidly as gas is increasingly used to generate electricity and displace coal, increasing its share of total energy from 21.4% in 2015 to 24% in 2040. Coal's share of energy consumption falls from 29% to 24%. The share accounted for by non-fossil fuels (nuclear, hydro, solar, wind, biomass) increases the most rapidly from 19% in 2015 to 25% in 2040.

Fact #7:

- The world's use of renewable energy will increase rapidly, but oil use will also increase to meet growing world energy demand over the next 25 years

Asian Demand for Canadian Crude Oil

There is very little domestic production of crude oil in most Asian countries (China, Japan, Korea, Taiwan, India, Philippines, etc.). There is, however, considerable crude oil refining capacity throughout the region and China is the world's largest refiner after the U.S. These countries import almost all of their oil, primarily from the Middle East.

China has publicly stated that it desires to diversify its sources of crude oil imports and has begun imports from West Africa even though the shipping distances are considerable. China has also expressed interest in importing oil from Canada and, as is well known, has invested in the oil sands. However, to date China's desire to import oil from Canada has been frustrated by Canada's inability to construct a pipeline from Alberta to the west coast.

Canadian oil producers are also highly desirous of exporting oil to Asia, both in order to diversify their markets and to obtain access to premium markets. Producers have made billions of dollars of firm transportation commitments to the Trans Mountain Expansion Project and they also paid for the regulatory costs for the Northern Gateway Project. Producers would not make these financial commitments if they were not confident that they could market Canadian crude oil in Asia.

Some parties have questioned whether there is really a market for Canadian crude oil in Asia. One of the arguments is that Canadian heavy crude oil would not be a desired input to Asian refineries. It is true that many of the refineries in Asia, particularly in Japan and Korea, are primarily configured to run light crude oil. However, China has considerable heavy crude processing capacity – northern China refineries have medium to high capacity of 4.7 mb/d to process heavy crude¹⁴. China is also building new refining capacity and its intent is to build complex refineries with the ability to process a full slate of crude oils. If China could be certain that oil would be available from Canada, it is probable that it would be more inclined to invest in refining capacity that would be ideally suited for Canadian heavy.

It should be noted that Canada has a proximity advantage to northern Asian markets as compared to the Middle East and Africa (Table One). Importantly, ocean transport is relatively inexpensive and the distance from Alberta to Vancouver is considerably shorter than the distance to the US Gulf Coast. Hence, the transportation cost to deliver oil to northern China is expected to be less than the cost to deliver Canadian oil to the Gulf Coast. This means that there will be an opportunity for western Canadian producers to earn higher netbacks from Asian sales.

¹⁴ Muse Stancil market evidence in NEB Trans Mountain Expansion hearing, Figure 12, p. 26. See: https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2825642/B427-2_-_2a_Muse_Stancil%2C_Market_Prospect_and_Benefits_Analysis_of_the_TMEP%2C_September_2015_-_A4T6E8.pdf?nodeid=2825856&vernum=-2

Table One
Ocean Transport Distances to Northern Asian Markets*
(kilometres)

	<u>Vancouver</u>	<u>Arabian Gulf</u>	<u>Nigeria</u>
China	10,250	12,000	20,650
Japan	8,600	13,270	21,930
S. Korea	9,250	12,550	21,200

* data from Muse Stancil’s market evidence submitted in Trans Mountain Expansion hearing before the National Energy Board.

It should also be noted that Canadian volumes would be small compared to the total refining capacity in northern Asia and could be easily absorbed by these refineries. The expanded capacity on the Trans Mountain system would be 890,000 bp/d, of which about 300,000 bp/d would continue to go to refineries in Washington state and Vancouver. Some crude oil would also be exported to California as its supplies from Alaska continue to dwindle. Therefore, the likely exports to Asia would be at most 600,000 bp/d, in a refining market of currently 21 mb/d (i.e. 3.0% of the market).

Lastly, Canada produces about 1 mb/d of synthetic crude oil that is equivalent to light crude oil and can be processed by refiners with only light crude processing capacity. Thus, synthetic crude oil could be processed by refiners in Japan and S. Korea that do not have heavy crude processing capacity.

In summary, there is a market for Canadian crude oil in Asia and this market would provide market diversification for Canadian producers and, given the positive transportation economics, higher netbacks.

Conclusion #2 – Asian Demand for Canadian Oil

- There will be a market in Asia for Canadian crude oil and this market would provide high netbacks and diversification value to Canadian producers

1.2 US Demand for Oil

The US is a mature economy and its vehicle market is saturated. All market analysts agree that US demand for oil will essentially be flat over the next 20 to 25 years. In its May 2016 Energy Annual Outlook, the US Energy Information Agency (EIA) projects¹⁵:

- US demand for petroleum will stay flat for several years and then decline slightly after 2030 as vehicles become ever more efficient
- US production of oil will rise slowly but steadily from 9.4 mb/d in 2015 to about 11.3 mb/d by 2040.
- Consequently, US imports of petroleum will decline to 7% of its total needs by 2040, down from 60% in 2005 and 25% in 2015

While overall petroleum demand is expected to stay flat, the US does have considerable installed refinery capacity that is well suited to process Canadian heavy crude. Therefore, it is highly probable that Canada will be able to continue to export significant volumes of heavy oil to the US mid-west and Gulf Coast. Nonetheless, it would be risky for heavy oil producers to depend solely on this market in the long term and CAPP has clearly stated that producers need to diversify their markets.

The California and Washington refinery markets have depended on Alaskan production which is declining. As these markets are not connected to US continental production, they will provide a growing market opportunity for western Canadian crude oil, if Canadian oil has access to tidewater. In summary, while the overall US market for imported crude oil is shrinking, there will still be demand for Canadian crude imports.

Fact #8:

- The overall US market, the traditional market for Canadian oil exports, is likely to shrink over time, but there will be opportunities to increase exports to the west coast if access to tidewater is provided.

Conclusion #3

- The US market for imported crude oil will shrink over the next 20 – 25 years, so Canadian oil producers must seek access to tidewater to access overseas markets

¹⁵ See US Energy Information Agency (EIA): <http://www.eia.gov/forecasts/aeo/data/browser/#/?id=5-IEO2016&sourcekey=0>

2. Outlook for Western Canadian Crude Oil Production

Some critics of the Canadian oil industry have argued that the industry is not competitive with other sources of crude oil, that investment will dry up and production will not grow. Therefore, they argue there is no need to build new pipeline capacity.

The facts, however, demonstrate that crude oil production from western Canada will certainly increase, particularly over the next five years. A number of producers have made large investments in oil sands producing facilities, and many of these projects are near completion. When these projects are completed, production will increase. Almost \$90 billion has been invested in the oil sands in the last three years, and most of this investment will only result in new production coming onstream post-2016¹⁶.

Based on its annual survey of producers, adjusted by its in-house analysis, CAPP projects that western Canadian oil production will grow from 4.0 mb/d in 2015 to 4.6 mb/d by 2020¹⁷. Growth in production of 600,000 barrels per day is equivalent to the size of a major proposed pipeline project, such as the Trans Mountain Expansion or Northern Gateway.

Notably, the National Energy Board (NEB) projects that western Canadian oil production will grow to 4.8 mb/d by 2020, and to 6.0 mb/d by 2040¹⁸. The IEA in its 2015 World Energy Outlook projected that Canadian oil production will grow over the period from 2015 – 2040, and that Canadian production growth will be the third highest in the world, after only Iraq and Brazil (Table One).

Table One

Outlook for Western Canadian Oil Production
(millions of barrels/day)

	<u>2016</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>2035</u>	<u>2040</u>
CAPP	4.0	4.6	4.9	5.5		
NEB	4.0	4.8	5.4	5.7	5.8	6.0
EIA ¹⁹	4.4	4.8	5.5	6.0	6.5	6.5

¹⁶ See CAPP's "Basic Statistics" and CAPP's "Statistical Handbook":

<http://statshbnew.capp.ca/SHB/Sheet.asp?SectionID=4&SheetID=202>

¹⁷ 2016 CAPP Crude Oil Forecast, Markets and Transportation, June 2016

¹⁸ See NEB Canada's Energy Future 2016, Figure 5.1, January 2016

¹⁹ US Energy Information Agency, "International Energy Outlook", May 2016. The EIA's data includes "other liquids", mainly pentanes plus, which accounts for the discrepancy between its figures and the NEB/CAPP figures in 2016. As pentanes plus production in Canada is expected to fall, the discrepancy between the EIA's figures and the NEB's and CAPP's also falls throughout the projection period.

All market analysts agree that the rate of production growth after 2020 is more uncertain, but given the huge investments made in recent years, rapid growth in production over the next five years is a certainty.

Conclusion #4:

- Oil production from western Canada will increase significantly in the next five years, with growth being equivalent to the capacity of a major new pipeline.

3. Adequacy of Pipeline Capacity

Some parties have argued that there is no need for additional pipeline capacity because the price discounts that were previously experienced have disappeared. It is true that the extraordinary price discounts that the industry suffered in 2012 and 2013 have disappeared, but the industry needs new capacity if a repeat of the discount situation is to be avoided.

Currently, pipeline capacity to carry crude oil out of western Canada is about 4.0 mb/d and productive capacity is about 4.0 mb/d²⁰. In other words, pipeline capacity is just adequate to transport production. While there is adequate capacity to transport total production, this does not mean there is adequate capacity to carry production to the best markets. Currently, most Canadian pipeline capacity is directed towards the U.S. market (Table Two).

Fact #9:

- Pipeline capacity is currently just adequate to carry production out of Western Canada.

Table Two
Pipeline Capacity from Western Canada

	<u>Capacity</u>	<u>Principal Markets</u>
Enbridge Mainline	2,800,000 b/d	US Midwest and eastern Canada
Keystone	600,000 b/d	US Gulf Coast
Trans Mountain	300,000 b/d	B.C. Lower Mainland, Washington State
<u>Spectra Express</u>	<u>280,000 b/d</u>	US Rocky Mountain Region
Total	4,000,000 b/d	

²⁰ Production in 2016 is down because of the wildfire in Fort McMurray but production is projected to return to productive capacity before year end.

Most of the existing pipeline capacity is directed towards Canada's traditional market, the US mid-west. There are increasing connections between the U.S. Midwest and the Gulf Coast that are enabling producers to move more oil to the Gulf Coast refining area and potentially to reach offshore markets, but the only direct connection is through Keystone.

Fact #10:

- Most of the existing pipeline capacity is directed towards Canada's traditional market in the US mid-west and the US market will be shrinking in future years.

The only current link to the west coast is provided by Trans Mountain. There is 79,000 barrels of day of capacity at the Westridge marine terminal in Vancouver that provides access to offshore markets but this terminal is constantly in apportionment because demand exceeds capacity. This is a clear signal that producers want to ship more oil offshore but are unable to do so because of limited capacity.

It is also clear that there will be inadequate capacity to carry added production to tidewater. Given the expected increase in production of between 600,000 – 800,000 bp/d over the next four years, it is clear that a significant increase in pipeline capacity is required.

FACT #11:

- With growing production in western Canada, there will be inadequate capacity unless significant new pipeline capacity is added.

Inadequate pipeline capacity can be very costly to the industry and Canada. If, for example, western Canadian producers were to lose \$5/barrel on sales of heavy crude due to inadequate access to markets, the lost revenues in one year would be over \$5 billion. When there is inadequate capacity, supply backs up behind the bottleneck and results in a glut, and discounted prices. In 2012 alone, the CIBC estimated that Canadian producers lost about \$25 billion due to discounts off the price they would have received if they had access to world markets²¹. The CIBC also noted that this meant that the federal government lost considerable potential tax revenues, illustrating the serious costs to Canada from inadequate pipeline infrastructure.

Fact #12:

- Lack of access to world markets caused by inadequate pipeline capacity is highly costly to the industry and to Canadians

²¹ CIBC Report: See http://business.financialpost.com/news/energy/canada-oil-producers-losing-15-billion-a-year-keystone-cibc?__lsa=9a6a-d3f0

It is important to note that all infrastructure works best when there is some excess capacity. Whether it is a road network, the internet, the electricity grid, or the pipeline system, some extra capacity is needed for at least three reasons.

First, there will be times of peak demand and, if the system cannot handle these peaks, there will be costs associated with congestion. On a road, it can mean a long time sitting in a traffic jam. On the electricity grid, it can mean power outages. On the pipeline system, it will mean that oil cannot get to the highest value markets and producers will lose market opportunities. Therefore, some excess capacity is needed to handle peak load situations.

Second, there will be times when part of the system is unavailable. When a road you regularly use is under construction, you have to take an alternative route. If there is no good alternative, there will be serious traffic backlogs behind the construction points. Similarly, if a pipeline segment is closed for maintenance, if there are no alternatives, oil will be trapped behind the congestion point and producers will lose sales opportunities or be forced to take discounts. Some excess capacity is necessary to allow for times when part of the system will be unavailable.

Third, and perhaps most importantly, market conditions are constantly changing and producers need some flexibility to be able to take advantage of these opportunities. Suppose, for example, that there is an interruption in production from California's heavy oil wells. Californian refineries would pay a premium to obtain oil from other sources. If Canadian producers have the ability to swing supplies, for example, away from the US mid-west towards the Californian market, they could benefit from the market opportunity. If, however, there is no flex in the transportation system, they will not be able to take advantage of these opportunities. Some excess capacity provides flexibility and "option value" as it provides producers with more options to market their products²².

Lastly, when infrastructure is always being operated at capacity it is bound to put a strain on the system, and accidents are more likely to occur. In fact, pipeline operators recognize these situations so it is far more likely that an operator will curtail throughputs in order to maintain the safety and integrity of the system, but it is far more desirable to have some excess capacity built into the system.

Fact#13:

- Pipeline infrastructure, like all infrastructure, works best when there is some excess capacity, or flex, built into the system.

²² The National Energy Board recognized the importance of option value in its recommendation to Cabinet to approve the Trans Mountain Expansion. See NEB Report: Trans Mountain Expansion Project, May 2016, p. 310-311.

The above comments apply to pipeline infrastructure in general. In the current and evolving situation facing Canadian oil producers, the danger is being connected to only the US market. The flexibility that the industry requires is the ability to access world markets and obtain world prices for Canadian production.

It should be noted that it is the pipelines' customers, primarily producers, who drive expansions of capacity and who pay for these expansions by committing to long-term transportation contracts. These customers are well aware of the costs and benefits associated with too little capacity versus some excess capacity, and they have clearly expressed the desire for additional capacity in the pipeline transportation system that will enable them to access world markets. The producers know their business!

Conclusion #5:

- New pipeline capacity that provides access to tidewater is badly needed.

III. Benefits of New Pipeline Infrastructure

Opponents of pipeline development often argue that further investment in the oil sands is not worth it and will not bring benefits to Canadians. However, the reality is that oil production and export makes a huge contribution to Canada's economy.

According to Natural Resources Canada, the oil and gas sector directly contributes almost 8% of Canada's GDP and indirectly contributes another 3%²³. This is a huge percentage of the 'real' goods economy because the service sector accounts for about 70% of GDP in Canada. NRCan also reports that the industry generates on average \$22 billion/year in taxes.

In 2014, exports of crude oil accounted for 17.5% of all Canadian merchandise exports, generating \$92 billion in revenue²⁴. Crude oil was Canada's number one export from 2011 – 2014, surpassing all sales of motor vehicles and auto parts in each year. The value of crude oil exports fell in 2015 with the worldwide fall in oil prices, but was still tied for second in value of exports, along with metals.

Fact #14:

- The oil sector makes a very significant contribution to Canada's economy.

²³ See NRCan "10 Key Facts on Canada's Energy Sector":
https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/pdf/10_facts-Energy_e_acc.pdf

²⁴ Statistics Canada: Export of Goods on a Balance of Payments Basis

A report by the Conference Board of Canada found that almost one-third of the economic benefits from oil sands development would accrue to provinces outside Alberta²⁵. This study clearly demonstrated that, due to supply chain effects, the benefits of oil sands development is widespread across Canada.

As part of its evidence submitted to the National Energy Board, Trans Mountain commissioned a study by the Conference Board on the economic impacts of building and constructing the Trans Mountain Expansion. The report found that construction and operation of the pipeline project would create 108,000 person-years of employment across Canada, would create \$18 billion in GDP and \$18.5 billion in added tax payments to governments, of which \$6.8 billion would accrue to provinces other than BC and AB²⁶.

Conclusion #6:

- Construction of new pipeline capacity would provide economic benefits to all Canadians

IV. Conclusions

The analysis in this report has reached five clear conclusions:

1. World demand for oil will increase over the next 25 years, driven by increasing vehicle sales, growing jet fuel demand, and growth in petrochemical production
2. There will be a market in Asia for Canadian crude oil and this market would provide high netbacks and diversification value to Canadian producers
3. The US market for imported crude oil will shrink over the next 20 – 25 years, so Canadian oil producers must seek access to tidewater to access overseas markets
4. Oil production from western Canada will increase significantly in the next five years, with growth being equivalent to the capacity of a major new pipeline
5. New pipeline capacity that provides access to tidewater is badly needed
6. Construction of new pipeline capacity would provide economic benefits to all Canadians

Veracity Plus has provided recommended Key Messages for CEPA based on these five conclusions (see separate attachment).

²⁵ See: “Fuel for Thought: The Economic Benefit of Oil Sands Investment for Canada’s Regions”, Conference Board of Canada, 2012

²⁶ See “The Trans Mountain Expansion Project: Understanding the Economic Benefits for Canada and its Regions”, Exhibit B427-4 – 3a, Trans Mountain Expansion Hearing before the National Energy Board

