

Robyn Allan

Hearing Order OH-4-2011
File No. OF-Fac-Oil-N304-2010-01 01
1/17

IN THE MATTER OF
ENBRIDGE NORTHERN GATEWAY PROJECT JOINT REVIEW PANEL

WRITTEN EVIDENCE OF ROBYN ALLAN

January 30, 2012

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1.0 Introduction

1. In the matter of the Enbridge Northern Gateway Project Joint Review Panel. Robyn Allan hereby submits the following document as written evidence.
2. The following documents are submitted as attachments to this written submission.
 - A. An Economic Assessment of Northern Gateway (the Economic Assessment Report).
 - B. Resume of Robyn Allan
3. Robyn Allan will present as a panel at the Hearing.

2.0 Written evidence of Robyn Allan

Please state your name and address

4. Robyn Allan
9294 Emerald Drive
Whistler BC
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Please provide your background and work history

5. I have included a resume as Attachment B to this written submission.

Have you previously testified before the National Energy Board?

6. No.

2.1 The Economic Assessment Report

Do you submit the contents of the report titled “An Economic Assessment of Northern Gateway (the Economic Assessment Report) as your written evidence and was the report written by you?

7. Yes. I am the author of the report entitled An Economic Assessment of Northern Gateway and I adopt it as my written evidence. The Economic Assessment Report is filed as Attachment “A” to this written submission.

Please describe the objective of the Economic Assessment Report and its contents.

8. The objective of the Economic Assessment Report is to analyze the macroeconomic and microeconomic consequences of the Northern Gateway pipeline project within the framework as presented by Northern Gateway in their Need and the Public Interest case. The material

prepared by Northern Gateway in this regard is submitted primarily in Volume 2 and Volume 6C of its Application 52.

9. The Economic Assessment Report is split into two parts where Part 1 addresses the macroeconomic consequences of the project on the Canadian economy and the Canadian public interest. Part 2 addresses the microeconomic consequences of this project including the impact of the structure and financing, the Net Canadian Benefit as defined as the benefit to the oil and gas industry, and the construction and operation of the project on the Canadian economy and the public interest.

Please explain the macroeconomic consequences of the Northern Gateway pipeline project as detailed in Part 1 of the Economic Assessment Report.

10. The evidence presented in Part 1 shows that from a macroeconomic perspective, the methodology utilized by the proponents consultants, and adopted by the proponent, to justify an economic benefit to the Canadian economy is inaccurate, characterized by computational errors, misrepresents reality, and is inappropriate to address the question of economic impact on the Canadian economy.

11. The proponent maintains that the purpose of Northern Gateway is to restrict crude oil supply to Canadian and US markets, thus raising the price of Canadian crude oil. This oil price increase will also be facilitated through access to Northeast Asian markets where an Asia Premium exists. Because crude oil prices are determined by the marginal price received for the last barrel, oil prices will be increased on every barrel produced in Canada by an average of \$2 - \$3, every year, over the period 2016 – 2046.¹

12. The crude oil supply forecast assumption used by Northern Gateway and its consultants is the same “with and without Northern Gateway.”² That is, there is no new crude oil production arising as a result of the construction of the Northern Gateway pipeline project and hence there is no new real economic activity upon which real economic growth and development can be based; only higher prices for each barrel produced.

13. Higher oil prices, without any corresponding change in real economic output, by definition, creates inflation. The impact of higher crude oil prices on the Canadian economy and the Canadian public interest have not been incorporated in the Enbridge Northern Gateway Application.

14. The Northern Gateway pipeline project has been presented as a production, or wealth generating growth impact, when Northern Gateway really represents an inflationary oil price shock to the Canadian economy.

¹ Enbridge Northern Gateway Application, Volume 2, Section 1.6 and extended by the Wright Mansell Report, Appendix B from 2026 – 2046.

² Muse Stancil Research (the Muse Report), Market Prospect and Benefits Analysis for the Northern Gateway Project, January 2010, Appendix A, Volume 2, Northern Gateway Application to the NEB, page 35 and Table A-1.

15. By estimating the benefit to the oil and gas industry from higher prices and inputting this estimate into an Input-Output model,³ the impact on the Canadian economy has been erroneously characterized, and only part of what might be considered an impact on the Canadian economy has been included in the presentation of the public interest.

16. More than 90% of the estimated impact of Northern Gateway on the Canadian economy, and hence more than 90% of the need and public interest case, depends upon the price increase assumed in the Northern Gateway material. Therefore, this misrepresentation of the consequence of Northern Gateway and erroneous characterization of the impact has significant implications for the overall reliability and usefulness of the public interest case.

17. Table 1, below, presents a summary of the economic benefits from Northern Gateway as presented in the Application. The relative contribution arising from higher oil prices, as determined by the Wright Mansell Report, has been calculated in the Economic Assessment Report attached as Appendix A to this written evidence. This Table is presented for ease of understanding the relative significance the projected oil price increase has on determining benefits as defined by Northern Gateway.

Table 1**Estimated Economic Benefits of the Project**

Economic Impact	Northern Gateway Estimate	Due to Oil Price Increase	Share from Oil Price Increase
GDP	\$270 billion	\$246 billion	91.00%
Additional Labour Income	\$48 billion	\$43 billion	90.00%
Person Years of Employment	558000	496687	89.00%
Government Revenue	\$81 billion	\$77 billion	95.00%

Source: Table 1-5 Volume 2 Section Enbridge Northern Gateway Application and Response to Federal Government IR No.1 Share from Oil Price Increase provided in the Economic Assessment of Northern Gateway Table 1.

18. The steady prolonged impact of a 2.3% - 3.5% increase in the price of crude oil, each year, over 30 years, has serious macroeconomic consequences which have not been properly addressed by the Northern Gateway analysis.⁴

19. The average annual real crude oil WTI at Cushing base prices assumed during the period 2016 – 2025 in the Muse Report are \$84.48 US/bbl compared to \$77.36US/bbl during 2010 – 2015—an annual average increase of 9.2%.⁵ The additional annual 2.3% - 3.5% price increase anticipated with Northern Gateway needs to be added to this pricing reality to fully appreciate the inflationary pressures that will be brought to bear on the Canadian economy.

³ Wright Mansell Research Ltd., (Wright Mansell Report), Public Interest Benefits of the Northern Gateway Project, Appendix B, Volume 2, Northern Gateway Application to the NEB.

⁴ The base price of WTI assumed in the Muse Report for 2016 – 2026 is \$84.48. The \$2 - \$3 net price lift is added to arrive at the percentage increase per barrel.

⁵ The Muse Report, op. cit. Table A-5.

20. To a limited degree the Northern Gateway case identifies the impact of higher oil prices on Canadian refineries that use western crude oil and the increased cost of toll rates for committed shippers before it calculates a Net Canadian Benefit. The Wright Mansell Report then utilizes a modified version of this Net Canadian Benefit to input into its Input-Output model.⁶

21. There are three significant problems with this limited focus respecting the impact of higher prices on the Canadian economy.

22. The first is that the Muse Report assumes price will only increase for western Canadian crude, when the supply restriction to Canadian and US markets, as well as the international determination of oil pricing will impact the price of all crude oil purchased by Canadian refiners. Hence, the \$23.7US billion (\$28CDN billion assuming an exchange rate of \$0.85CDN to \$1US consistent with the Muse Report) estimate is an excessive estimate for the benefit because it does not take into account the full impact of oil price increases on Canadian refineries.

23. The second significant problem is that there are translation errors, and unreasonable assumptions adopted by the Wright Mansell Report in applying the Muse Report findings to develop its estimate of the Net Canadian Benefit to use as input into its Input Output model of the Canadian economy. The Wright Mansell Report, undertaking a similar methodology to Muse, and assuming a reinvestment of revenues back into the Canadian economy over a 30 year period, arrives at a figure of \$264.1CDN billion for an estimate of the Net Canadian Benefit from higher oil prices. The \$264CDN billion is meant to represent a finding similar to the Muse Report \$28CDN billion expanding the methodology from 2025 until 2046 and allowing for a reinvestment of the pricing gains, because of Northern Gateway, into the Canadian economy.

24. The first two problems are examined as part of the microeconomic exploration of the Northern Gateway Need and the Public Interest Case in Part 2 of the Economic Assessment of Northern Gateway and discussed in more detail later in this written evidence.

25. The third significant problem inherent in the Northern Gateway limited identification of the impact of higher prices on the Canadian economy is that the Input Output model is incapable of providing feedback from consumers and industry that rely on oil as an input. Therefore, the model is incapable of incorporating how consumers and industry adjust to higher oil prices. Because the inflationary impact of higher prices is excluded, the analysis assumes there is no ongoing cost to the Canadian economy and grossly misrepresents the benefit of Northern Gateway.

26. Higher oil prices because of Northern Gateway are passed onto refiners, who in turn pass the price increase directly onto retail consumers and other businesses. Businesses respond

⁶ Ibid., page 36 and the response to the Federal Government IR No. 1.3 www.neb-one.gc.ca/ll-eng/livlink.exe/fetch/2000/90464/90552/384192/620327/624798/725347/B41-6_-_Attachment_Federal_Government_IR_13_-_A2E8J2.pdf?nodeid=725442&vernum=0

to the negative impact higher prices have on their profit margins by cutting costs, including labour, which leads to downsizing, and/or they respond by raising prices which makes their products less competitive internationally and affects the balance of trade.

27. Canadian consumers respond to higher prices by shifting consumption from one part of their limited budgets to another. They have little choice since real incomes for most Canadians have increased very little over the past 30 years and household debt is at historical highs. When the transfer of spending occurs, a decline in demand is felt among industries and within communities where the reduced spending takes place. These sectors of the economy begin to contract and unemployment rises, while the standard of living for most Canadians falls.

28. As the consequence of higher oil prices hit their second round of effects, and unemployment increases, pressure is brought to bear on income support programs and a further decline in consumer demand. Meanwhile the inflationary impact puts upward pressure on interest rates and the cost of business and consumer debt rises, including mortgages and other consumer loans. This transfers a greater share of income to banks and other financial institutions.

29. With higher interest rates businesses pull back on investment decisions and consumers defer their spending on big ticket items such as housing and vehicles. Job creation, and the income and opportunity that goes with it, is negatively impacted.

30. Northern Gateway has been asked to comment on the impact price increases would have on the Canadian economy and has responded that the higher price to producers “could have the effect of raising the price of gasoline slightly...the most likely impact would be an increase of about \$0.015 Cdn per litre of regular gasoline...its effect on food prices is expected to be negligible.”⁷

31. The conclusion of a slight and negligible impact is erroneous. Not only does it underplay the inflationary impact Northern Gateway will have because it fails to incorporate the compounded feedback of higher prices as explained in points 26 – 29 above, it also misrepresents its incidence for a number of important reasons:

a) oil price increases impact middle and low income households who “spend more than twice as much of their income on energy as do high-income households”⁸

b) the consequences of inflationary pressures intensify the longer and more entrenched the price increase is: Northern Gateway is a minimum 30 year upward pressure on crude oil prices of between 2.3 -3.5 % per year;

7 https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/763997/B43-10_-_Response_to_J._Weir_IR_No._5_-_A2I8L4?nodeid=763 page 76, page 80. J. Weir IR No. 5 p. 76 and the Federal Government in IR 1.13.17 a p.65

8 <http://www.chamber.ca/images/uploads/Reports/2011/1106OilPrices.pdf> page 4.

c) the inflationary impact of Northern Gateway could be much higher. Evidence submitted to the Hearings by the Government of Alberta—the Wood Mackenzie Report titled “*A Netback Analysis of West Coast Export Capacity*” suggests a price increase due to Northern Gateway of as much as \$8/bblUS for heavy crude oil exports, each year, from 2017 – 2025.⁹ This would mean about a 7% increase in the price of oil impacting the Canadian economy each year over what would occur without Northern Gateway;

d) none of the Northern Gateway analysis incorporates the impact higher crude oil prices in the US will have on the demand for Canadian oil and non-oil imports. US consumer demand is sensitive to price increases for refined products, particularly in light of recent economic developments;¹⁰

g) inflationary pressures, regardless how mild, turn up the heat in the economy. Oil price increases, in particular, cause the Bank of Canada to respond by raising interest rates.¹¹

h) models capable of incorporating both the benefit to the oil industry from a price shock, and the negative inflationary aspect of higher oil prices on the Canadian economy, predict permanent declines in GDP, job losses, lower labour income and government revenues.

32. The appropriate methodology for assessing the impact of Northern Gateway on the Canadian economy is to recognize the impact as a price shock and measure its effect within a dynamic general equilibrium framework capable of more effectively weighing the gains and losses over the time period under consideration.

33. General equilibrium models used to estimate the impact of a price shock have found that strong and sustained increases in the price of oil pose challenges for fiscal and monetary policy and result in a permanent decline in real GDP, and hence a permanent loss of jobs and government revenue.

34. There is evidence that the Canadian economy is showing symptoms of the Dutch Disease whereby exploitation of natural resources leads to a decline in manufacturing output and employment. Rapid raw resource extraction which significantly increases the value of the Canadian dollar can permanently impact the viability of the manufacturing sector such that, subsequent to the economic boom generated by raw resource extraction and export, the manufacturing sector can not recover.

35. Although the phenomenon of the Dutch Disease is real in Canada, it is not the complete reason for the economic challenges facing the Canadian economy, nor the full reason why a general equilibrium framework would point to a long term decline in GDP and standard of living. The Dutch Disease is a contributing factor to our appreciated dollar, but the weakening of the US dollar has also contributed to our unique balance of trade challenges.

9 <http://www.energy.alberta.ca/Org/pdfs/WoodMackenzieWestCoastExport.pdf> Evidence of the Province of Alberta

10 <http://www.fas.org/sgp/crs/misc/R41478.pdf> page 16

11 <http://www.bankofcanada.ca/wp-content/uploads/2010/02/wp09-33.pdf>

36. The many limitations inherent in the Input Output framework adopted by Northern Gateway can only be addressed by a more dynamic general economic equilibrium framework. At the same time this does not provide an appreciation of the opportunity cost Northern Gateway represents vis a vis potential other strategies that might be pursued to enhance real economic growth and job creation in Canada.

37. Significant opportunities exist to improve real output (GDP), economic growth, employment and government revenues while keeping inflationary pressures in check, if a deliberate economic growth strategy was pursued whereby investment in all stages of the supply chain was undertaken within Canada, as distinct from exporting crude oil.

38. None of the opportunity costs inherent in building a crude oil pipeline to access Northeast Asian markets as it impacts eastern Canadian access to crude oil supply and long term energy security, or its impact on lost value added opportunities for western Canadian and eastern Canadian enhanced upgrading refinery capacity has been considered by the Northern Gateway application. However these lost opportunities represent significant costs from the perspective of the public interest as they are foregone potential increases in meaningful job creation and enhanced real incomes for Canadian citizens.

39. In summary, from a macroeconomic perspective, the Need and the Public Interest Case presented by Northern Gateway is an attempt to present an inflationary price shock as if it were a productive growth shock. As a result the information presented not only misrepresents the project's impact on the Canadian economy, it is grossly misleading. If the Northern Gateway project were to receive approval, and the oil industry was successful in their goal of raising oil prices, Canadian consumers and businesses will suffer losses in income as they contribute significantly to oil industry windfall profits (the gains from economic rent rather than productivity) and this will lead to a permanent decrease in Canadian economic growth, job losses, reduced standard of living, reduced labour income and reduced government revenues.

Please explain the microeconomic consequences of the Northern Gateway project as detailed in Part 2 of the Economic Assessment Report as it relates to the proponents proposed structure and financing.

40. The limited liability corporate structure as outlined by Northern Gateway could have implications for the public interest with respect to its containerization of responsibility in the event of a downturn in the Canadian economy and/or oil spill liability.

41. Generally, the purpose of limited liability partnerships is to reduce (limit) direct responsibility and reduce tax liability, while providing the benefits of a more traditional corporate (incorporation) form of organization. Although insufficient information has been provided with respect to how the Northern Gateway Limited Partnership is intended to access these two potential benefits from a business perspective, until information is forthcoming to the contrary it is assumed that both these features of limited partnership forms of organization are intended with the Northern Gateway structure.

42. The protection afforded by a limited liability partnership may have consequence in terms of the liability limits of an insurance program established to compensate the public in the event of an oil spill. That is, subsequent to the protection of an umbrella corporate policy available to cover insurance claims, the entity must draw on the cash resources of the company. The structure proposed by Northern Gateway provides a limited access to available cash resources by virtue of the partnership limits for liability, and may limit access to the resources of Enbridge Inc. unless explicit, legally binding, evidence to the contrary.

43. Recent oil spill claims experience within the broader oil and gas industry, as well as among pipeline operators, including Enbridge have been frequent and severe. In 2010, an oil spill from Line 6B resulted in contamination of the Kalamazoo River near Marshall, Michigan and booked charges for remediation, net of fines and penalties, have reached \$725 million. This cost exceeds the umbrella liability insurance policy held by Enbridge for use by its subsidiary companies of \$650 million. The cash flow from the limited liability company, Enbridge Energy Partners (EEP), must satisfy the shortfall. EPP currently has sufficient cash flow to cover the excess costs over liability insurance.

44. The asset base anticipated with Northern Gateway is the twin pipeline system, the pumping stations and the marine terminal facilities in Kitimat. The asset base is much smaller than that which exists with EEP, and hence EPP has a larger base of income generating assets than Northern Gateway would. For example, when Line 6B was non-operational, other lines the partnership owns were continuing to generate cash flow and as such the diversification of non-performance risk is spread across a larger operation with more numerous sources of recurring income than would exist with Northern Gateway.

45. What the unique features of Northern Gateway's limited liability partnership represent is a relatively small asset base with only one source of recurring income which could be significantly impacted in the event of an oil spill. As a result the access to cash resources once umbrella insurance protection is utilized could be significantly restricted as compared to resources available from a large corporate entity.

46. Subsequent to the 2010 policy year, Enbridge has seen its umbrella policy for oil spill liability reduced to \$575 million, while its insurance premiums have increased. Although there is some time between the current insurance year and the date at which Northern Gateway would expose Alberta and British Columbia to pipeline and marine terminal oil spill risk, the realities of the existing insurance climate, and Enbridge's ability to source insurance protection on behalf of Northern Gateway, must be incorporated into any analysis of adequate financial resources to cover all costs from pollution. If adequate resources are not available, the Canadian tax paying public would be faced with the potential excess costs. It is very important that this exposure be quantified, beginning with an explicit identification of Enbridge Inc.'s direct responsibility and exposure for any and all potential events.

47. Recent oil spill claims experience with diluted bitumen, as compared to lighter crude oil illustrates that there are forces at work that are redefining estimates of environmental and social damage, along with expectations regarding the time involved for effective clean up. The

Kalamazoo spill was the first diluted bitumen spill the Environmental Protection Agency (EPA) in the US has had in an inland waterway. New methods had to be devised to clean it up. Insurance underwriting practices will reflect this experience.

48. Environmental risk facing communities and the public interest exposed to the risk is always greater than the environmental risk facing a business entity posing that risk. Extra effort needs to be made to incorporate a recognition of this inequitable burden in the design and implementation of safety, mitigation and redress action and compensation plans and programs.

49. From the perspective of investors the Northern Gateway pipeline project time horizon, assuming no environmental spill events, and buoyant economic conditions, could be 30 years or longer. However, if undesirable events threaten the revenues of the limited partnership, the time horizon of the project may only be ten years or less. Given the guaranteed rate of return to investors (ROE) of 12%, the payback of the project is 8.33 years. Although not a good indication of profitability, payback does provide an indication of when real losses turn into paper losses, and hence the financial risk is the loss of future profit potential.

50. An appreciation of the time horizon risk from a limited partnership structure needs to be included. As well, the accessibility of traditional sources of financing in the event of a major spill, such as the issuance of debt, or additional equity, becomes severely limited in a scenario where the current or future income earning ability of assets may have been compromised.

51. The structural arrangements between shippers who are equity investors, and the situation where a shipper may also be an owner of assets, as contemplated in the financing of Northern Gateway, has the potential to reduce competitive market forces usually at work in the determination of toll rates.

52. This situation could become more pronounced the greater the tax benefits arising from different sources and uses of income among shippers who are also investors. Since Northern Gateway represents a redirection of crude oil from existing transportation systems, and hence their toll rates are expected to increase, the degree to which Northern Gateway tolls may be inflated has a negative consequence throughout Canada, since Northern Gateway toll rates may be used as coercive comparison in regulatory and business negotiations.

Please explain the microeconomic consequences of the Northern Gateway project as detailed in Part 2 of the Economic Assessment Report, with respect to the oil and gas industry and the Net Benefit Calculation.

55. The Net Benefit Calculation provided in the Muse Report of \$23.7 billion suffers from a number of weaknesses. A minor weakness is that the estimate presented throughout the Northern Gateway Need and the Public Interest Case (\$28 billion) is expressed in Canadian dollars using the exchange rate assumption assumed in the report from 2016 – 2025 of \$0.85 Canadian to \$1.00US.

56. The Net Benefit Calculation was calculated based on the assumption that the price of oil would increase by between \$2 - \$3 each year for the first 10 years of Northern Gateway' operation by projecting crude oil production, by grade, by western Canadian crude producers and multiplying those figures by the estimated price increase, by grade. This figure resulted in the Gross Canadian Producer Benefit.

57. The impact on Canadian Refineries that use western Canadian crude oil was calculated by projecting refinery throughput and multiplying, by grade, the estimated price lift as a cost to refineries. This Canadian Refinery Impact was deducted from the Gross Producer Benefit.

58. The cost of committed tolls by shippers was provided to the Muse Report consultants from Northern Gateway and this cost was deducted to arrive at a Net Canadian Benefit each year, for ten years 2016 – 2025. These annual figures were summed to reach \$23.7 billion which was then increased 18% (an exchange rate equivalent to 85 cents Canadian being 1.18) to reach \$28 million CDN. It is this figure that Northern Gateway refers to as the Net Canadian Benefit arising because of the benefit to the oil and gas industry.

59. The Muse Report fails to include all crude oil produced in Canada, although the report states it does. Although it is a relatively small portion of total Canadian production, it needs to be added to the Gross Canadian Producer Benefit.

60. The Muse Report fails to include the price increase on all crude oil consumed in Canada since the construction of Northern Gateway will lead to a decrease in supply flowing to eastern Canada and the US. In the first year of operation, the supply reduction is estimated to be 40,000bbl/d withdrawn from eastern Canada and 400,000bbl/d from the US. The impact of this supply reduction will serve to put upward pressure on all crude oil consumed in Canada as refiners adjust.

61. This pricing impact has not been included in the analysis, but since Canadian refiners import almost all of their crude oil needs, a restriction of supply that recalibrates WTI at Cushing, and enables western Canadian crude to access higher prices in Northeast Asia, will have an impact on all oil prices and increase the cost of crude oil throughout Canada; not just the price of western crude oil.

62. Assuming the same average price increases by year as the Muse Report, but including all Canadian crude oil consumption in Canada, reduces the Net Canadian Benefit Calculation by 33% from \$23.7 to \$15.8 billion.

63. The supply projection utilized in the Muse Report is the Canadian Association of Petroleum Producers 2009 Growth Forecast. This forecast includes some production volumes that have yet to be approved by corporate boards and/or regulatory authorities. The evaluation required by corporate boards and/or regulatory authorities provides a significant discipline on the production expansion decision making such that, subsequent to those decision making hurdles, the likelihood of achieving those production levels is much higher.

65. Given that it is common practice for decision makers to be presented with various scenarios of output based on the relative likelihood of them occurring, it would be more informative to have a representation of supply projections including a base case that represents Operating and In Construction along with a Growth Case that represents a more rapid, and less likely supply scenario.

67. The CAPP 2009 Operating and In Construction Forecast as compared to the CAPP 2009 Growth Forecast represents an average of 966,700 bbl/d requiring corporate board and/or regulatory approval prior (as at the date of the Muse Report submission). This represents fully 25% of estimated supply being relatively vulnerable to market conditions and easily “pulled off the table” should the robust projected economic demand conditions—as assumed by the Muse Report—change.

68. The Net Canadian Benefit is completely based on the net increase in price assumed by the Muse Report with a significant portion of the price increase dependent on the realization by western Canadian producers of the Asia Premium. The Muse Report assumes the Asia Premium will persist. It represents \$1.60/bblUS of the price increase. Given that the average price increase anticipated in 2016 is \$1.88/bblUS, 85% of the anticipated price increase is a function of realizing the Asia Premium. Once it is realized, the price on all Canadian crude oil produced increases accordingly.

69. The expectation that the Asia Premium will survive into the forecast period is optimistic for a number of reasons including the interaction of supply and demand forces as producers from many nations such as Russia, not just Canada, increase supply.

70. The intended role as equity investors by National Oil Companies such as Sinopec and the Chinese National Offshore Oil Company (COONC, who indirectly through its part ownership of MEG Energy has access to equity ownership) are unlikely to inflict price-gouging on themselves.

71. Increasing concern by Chinese policy makers that price controls designed to protect Chinese consumers from higher prices, in part due to the Asia Premium, are leading to improper market signals within China and the potential removal of these price controls will impact oil demand.

72. Increased partnership arrangements in refineries between Sinopec and Saudi Arabia, through Saudi Aramco its National oil company, could also serve to reduce or remove the pricing premium.

73. To the extent the price increases anticipated in the Muse Report do not materialize, the Gross Benefit to producers and the Canadian Refinery Impact fall proportionately such that if the pricing increase is zero, the cost to the oil and gas industry would be the committed tolls agreed to by producers. This would be a net cost to the industry, as the Muse Report assumes that the supply destined for Northeast Asia would have been transported along pipelines to the

US and other parts of Canada. In a scenario where the net price for oil does not increase, transportation costs on Northern Gateway are additional charges to be incurred by the industry.

74. Not only is the Net Benefit Calculation sensitive to supply and pricing assumptions, it is also very sensitive to exchange rate assumptions. The Net Benefit Calculation assumes the Canadian dollar trades at a discount to the US dollar over the life of the project (Canadian dollar equal to 1.18 US, having fallen gradually to the level leading up to the commencement of the pipeline). Not only is this assumption unreasonable in light of the role crude oil exports play in assisting in the appreciation of the Canadian dollar, a small and sustained appreciation in the Canadian dollar from the rate assumed in the Muse Report could have a significant impact on reducing the the Net Benefit Calculation.

75. Although sophisticated treasury operations of multinational oil companies plan to mitigate the impact of exchange rates on their earnings, the hedging methods are generally effective for less than five years and generally do not cover all exposure to exchange rate risk. Because the purchase and sale of crude oil takes place in US dollars, and Canadian based energy companies report earnings in Canadian dollars, currency risk exists. Oil corporations planning to participate as shippers with Northern Gateway have published in their annual reports their exchange rate sensitivity, even with sophisticated hedging, and it is not trivial.

76. Although a detailed modeling of the relative exposure of the Canadian industry to exchange rate fluctuations would need to be undertaken to quantify the absolute loss of benefit for any given appreciation in the Canadian exchange rate, the direction of the impact is easy to estimate. As the value of the Canadian dollar rises, the gain to Canadian oil producers from an increase in the price of crude oil is eroded. The degree of erosion will depend on the relative increase (and the duration of that increase) in the value of the Canadian dollar as compared to the net relative rise in the price of oil because of Northern Gateway.

77. For any given increase in the value of the Canadian dollar, oil producers in Canada suffer an exchange rate loss, and Canadian refiners experience an exchange rate gain. Assuming no hedging facilities in place, if the value of the Canadian dollar increases by 2 cents from an 85 cent exchange rate assumption, as is presented in the Muse Report, the revenue gain to a crude oil producer for a \$2/bbl increase in the price of crude from \$85/bbl, is effectively zero.

78. The gain to Canadian refiners arising out of price increases due to Northern Gateway is not really a gain—it is just a minimization of losses. Under the scenario identified above, refineries would pay \$87US instead of \$85US without Northern Gateway. As a result, the appreciation of the Canadian dollar, which would have lowered their effective cost, sees them paying the same as they would without Northern Gateway. Northern Gateway under a currency appreciation scenario will have an intensified negative effect on the oil industry and the economy.

78. The Net Benefit Calculation is very sensitive to any change in the value of the Canadian dollar yet discussion of this reality, or sensitivity analysis to shed light on its implications, has not been provided.

Please explain the microeconomic consequences of the Northern Gateway project as detailed in Part 2 of the Economic Assessment Report, with respect to the Canadian economy from the construction and operation of the project.

79. The Need and the Public Interest Case provided by Northern Gateway includes the construction and operation of the pipeline and its impact on GDP, employment, labour income and government revenues. It also includes the price increase and reinvestment of this price increase as the substantive part of its net impact on the Canadian economy.

80. As has been discussed in Part 1 and in the beginning of this evidence, the benefits arising from the price increase and its reinvestment can not be considered as they exclude a range of macroeconomic costs to the Canadian economy and misrepresent the likely outcome.

81. However, since the translation of the Muse Report Net Canadian Benefit (\$28 billion) is critical to the derivation of the Wright Mansell Report Net Canadian Benefit is it important to address how Wright Mansell transformed the Muse Report estimate methodology to their analysis.

82. It would be reasonable to assume that the analysis undertaken by Wright Mansell, using the same price lift and same supply forecast would arrive at very similar, if not identical conclusion as the Muse Report. This is not the case. The Wright Mansell Report, for the period 2016 - 2025 arrives at an Oil Industry Net Incremental Value of \$32 billion—14% greater than Muse's \$28 billion. It is this larger annual Net Benefit that Wright Mansell uses to predict economic benefits to 2045 and eventually arrives at a figure of \$264.1 billion as the Net Benefit, whereas the Muse Report suggests \$28 billion.

83. The reason for this higher estimate seems to relate to the exclusion of toll rates from the Wright Mansell Report and the identification of an extra benefit called “Gateway Sales”. The Wright Mansell Report then takes an inflated estimated benefit figure and extrapolates this figure from 2026 – 2046. The details of the Wright Mansell misspecification of the Net Canadian Benefit approach are provided in Section 2.4 of the Economic Assessment Report attached as Appendix A to this evidence.

84. In addition to an estimate of the price impact on the Canadian economy undertaken in the Wright Mansell Report an attempt to measure the relative contribution of the construction and operation of the project was also undertaken. A similar analysis of the economic contribution from the construction and operation of Northern Gateway has also been presented in Section 6C, Environmental and Socio-Economic Analysis (ESA) as required under statute. The comments that follow apply to both those analyses.

85. The relative contribution of the construction and operation of the pipeline to the Canadian economy is very small, however, there is some impact.

82. The limitations of Input Output analysis in presenting a complete picture of the impact of a change in production or a change in demand on the economy are clearly discussed in the Economic Assessment Report. However, having accepted this approach as possible method to examine the impact of a construction project or the operation of a transportation system on the regional or national economy, it becomes imperative that the data used as the input is reliable and reflective of the actual net change in production or demand.

83. The Wright Report and Volume 6C use the capital budget estimate of \$5.5 billion as its input for the construction portion of the analysis. There is significant evidence that suggests this figure is too high particularly from the perspective of the allocation of Enbridge Inc.'s overhead expenses to the project, the corporate overhead of the construction firm likely to be hired to undertake the construction, and costs incurred to date to lead up to construction that might be capitalized into the budget.

84. It is also possible that Enbridge will allocate staff resources to the construction phase of this project that it would maintain on its payroll regardless of whether Northern Gateway was built or not. These staff, and their payroll should not be included in the input figure.

85. Finally, the Wright Mansell Report assumes a reinvestment rate within the industry of 40% which suggests that if Northern Gateway was not built, at least that portion of the capital would find its way back into the economy. It is therefore necessary the input figure to the Input Output model be adjusted accordingly. What we really need to see to assess the Need or the Public Interest is the net benefit of the construction of Northern Gateway on GDP, employment, labour income and government revenues, not the gross impact, a large portion of which would be realized if Northern Gateway did not proceed.

86. Therefore the input into the Input Output analysis is highly exaggerated in terms of the public interest case and until the input figure is adjusted appropriately, discussing the output from the model is moot.

87. The Muse Report and Volume 6C also identify a benefit from the operation of Northern Gateway from the revenues derived from tolls paid on crude oil and condensate shipments. To the degree that Northern Gateway displaces current shipments on existing pipelines, injecting into an Input Output model revenues which would have been paid anyway is misleading. Any lost revenues to any Canadian pipeline or rail transportation systems should be netted off to discover what the incremental effect, if any, arises from the operation of Northern Gateway.

88. Thus until that analysis is forthcoming, it is not possible to determine whether there is any net revenue benefit to the Canadian economy arising from the operation of Northern Gateway.

Robyn Allan

Hearing Order OH-4-2011
File No. OF-Fac-Oil-N304-2010-01 01
17/17

AN ECONOMIC ASSESSMENT OF NORTHERN GATEWAY

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and submitted to the National Energy Board
Joint Review Panel
as Evidence

January 2012

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Executive Summary

The purpose of this report is to assess the economic case for the Northern Gateway Pipeline Project which relies on Enbridge's projection of a \$2 - \$3 increase in the price of oil, on every barrel of oil produced—every year—for 30 years. The production forecast used in their analysis is the same forecast with or without Northern Gateway and therefore there is no real increase in the productive capacity of the Canadian economy—just a redirection of supply.

The real impact of this project is not an income generating growth opportunity as the proponent would have the Canadian public believe. Northern Gateway represents an inflationary price shock which will have a negative and prolonged impact on the Canadian economy by reducing output, employment, labour income and government revenues.

Part 1 of this report addresses the misrepresentation of this project to the public and explains the implications for the macroeconomy and strategic policy. It is determined that Northern Gateway is neither needed nor is it in the public interest. The project represents serious economic risk to the Canadian economy. Northern Gateway is in a double bind. Without an inflationary increase in oil prices the project's benefit case crumbles. That is, unless Northern Gateway increases oil prices for Canadians there is no industry benefit and hence no economic benefit.

Part 2 of this report addresses the vulnerability of the Enbridge case to changes in its underlying assumptions and reveals that closer scrutiny of the methodology exposes numerous errors, misspecifications, presentation bias and extreme sensitivity of the outcomes projected to relatively minor changes in key economic variables, particularly supply, price and exchange rates.

The main focus of this report is an assessment of the economic case presented by Enbridge, an identification of what the proponent has missed, and discussion of the errors in analysis that must be addressed. However, should Northern Gateway be built, even in light of its risk to the Canadian economy and the environment, there is significant opportunity cost presented by this project. Northern Gateway means lost opportunity to create a long term energy security strategy for Canadians. It also represents a lost opportunity to ensure reasoned and sustainable development of crude oil resources that captures real value added in an environmentally responsible manner for the benefit of all Canadians.

The opportunities lost if Northern Gateway is built are real but they are being ignored by policy makers responsible for protecting the public interest. Foreign national oil companies recognize the opportunity inherent in value added refining of crude oil and distribution of petroleum products. This is at the root of their development strategies and they plan to take full advantage of improving on them by directly investing in Northern Gateway. Northern Gateway is a means to an end for foreign nationals—ensuring access to Canadian crude oil in order to feed their offshore refineries and distribution networks in the decades to come.

Canada's federal and provincial leaders have abdicated their responsibility for meaningful energy policy by endorsing Northern Gateway, and have willingly stepped aside while the value added potential of our raw resources is sold-short on the international market. From a public policy standpoint, Canada is being outplayed.

AN ECONOMIC ASSESSMENT OF NORTHERN GATEWAY

Part 1. The Real Economic Impact of Northern Gateway on the Canadian Economy

1.1 Introduction

Good economic decisions can only be made by developing analysis able to take into account the full impact of a proposed event—analysis that is able to present “*that which is seen and that which is unseen*”.¹

To arrive at economic truth about whether or not Northern Gateway is in the public interest requires that we are able to observe the immediate consequence—the benefits and the costs—of the project, and examine the consequences of each round of impacts until they have all played out. We need to understand the consequences over the short, as well as the long run, and value the relative effects of such consequences appropriately. We must examine the pipeline's effect not just on one group or industry, but on all people and industries in Canadian society as a whole.

The purpose of this report is to discuss and evaluate the economic case for the proposed Northern Gateway Pipeline as presented by Northern Gateway Pipelines Limited Partnership and submitted, on behalf of the Partnership, by Enbridge Inc., the project's majority owner and key proponent. The economic case is the Need and Public Interest Case the Joint Review Panel (JRP) must consider to determine if the project is, or is not, in the public interest of Canada. The economic case presented by Enbridge is found primarily in Volume 2 and Volume 6C, Section 4 of the company's Application 52 to the National Energy Board (NEB).

The economic case for Northern Gateway is built on the premise that with the twin pipeline and associated marine terminal there will be a more extensive contribution to Canadian gross domestic product (GDP), national income, job creation, personal income, government revenues, and hence standard of living for Canadians, than without it.

The materials presented in the Application suggest these benefits will arise from four main sources: construction of the pipeline, operation of the pipeline, oil price increases for every barrel of oil produced in Canada because of the pipeline, and reinvestment of the revenues from higher prices. More than 90% of the benefit contribution calculated by Northern Gateway is attributable to the the higher prices Canadian producers expect to capture, every year, for 30 years, because the pipeline is built. Since these prices are realized on every barrel of oil produced, not just on barrels exported, the price increase is borne by Canadian refiners and directly passed onto consumers and business.

Northern Gateway has been presented as a wealth generating growth opportunity for the Canadian economy when it is an inflationary oil price shock. This report details the impact these higher oil prices will have as they feedback through the economy, year after year, as consumers and businesses attempt to adjust. The inflation Northern Gateway represents will lead to higher interest rates, a permanent and long term decline in GDP, a loss of existing jobs, decline in labour income and standard of living for many Canadians, as well as a deterioration of government revenues.

¹ Frederic Bastiat explained in 1850, a good economist must take into account both “that which is seen and that which is unseen” otherwise an event, like a broken window, might be interpreted as giving rise to economic growth when it actually represents lost opportunity for growth—fixing it is not “new” economic activity.

Northern Gateway is not needed nor is it in the public interest. The project is being marketed as a boon to the Canadian economy when it poses a serious threat to real economic growth and long term development. What is needed is a renewed commitment to investment in value added and a strategy that seeks to create meaningful jobs and wealth creation in the Canadian economy—for Canadians. If we are unable to clearly see what Northern Gateway represents in terms of price stability and lost opportunity we may be seduced into believing the environmental risks posed by the project are acceptable. But Northern Gateway represents serious economic risk that has not been properly evaluated.

The Northern Gateway Need and Public Interest Case is based on misleading information, faulty methodology, numerous errors, and presentation bias. It presents a windfall of economic benefit to oil producers, without addressing its cost to Canadians. We are presented with only upside, when in reality the downside is more significant. Acknowledging the economic cost of this project to the Canadian economy reveals “the Emperor has no clothes.”

But Northern Gateway is in a double bind. In Part 2 of this report, it is shown that without inflationary price increases for oil, Northern Gateway has no benefit case—the economic benefits from the pipeline all but disappear. Or as we like to say in western Canada, “l'Empereur n'a pas des vêtements.”

1.2 Overview of the Northern Gateway Case

The economic case presented by Northern Gateway addresses the incidence of the pipeline across three broad categories of interest:

a) Impact of Proponents: Northern Gateway LLP and Pipeline Partners

The project is being developed by Northern Gateway Limited Liability Partnership. Enbridge Inc. is the first limited partner, and is currently holding 99.81% of the Limited Partnership. Northern Gateway Pipelines Inc. is the General Partner holding 0.19% of the Limited Partnership. The General Partner is owned 100% by Enbridge (Gateway) Holdings Inc., which in turn is owned 100% by Enbridge Inc., a publicly traded corporation listed on the Toronto and New York stock exchanges.

The General Partner, Northern Gateway Pipelines Inc., will manage all project construction and operating activities. The General Partner behaves similarly to a management company for the Limited Partnership—Northern Gateway. Enbridge provides to Northern Gateway, under contract and for payment, certain services required for the project.

The partnership—Northern Gateway—proposes to sell a further 10 partnership interests of 4.9% each, representing 49% interest in the project by investors other than Enbridge. This structure is subject to dilution to accommodate Aboriginal equity investment.²

² http://www.northerngateway.ca/assets/pdf/application/Master_Vol%202_Final_11May10.pdf page 2-2. The LLP may include 11 equity investors as limited partners with the Aboriginal community comprising a maximum ownership of 10% of the project as a group. Response to JRP No.9 states one participant has a right to direct ownership.

Volume 2, Section 2 Commercial Considerations, Section 3 Toll Structure and Principles, and Section 4 Proponents and Financing of the Enbridge Application deal with the economics of the project with respect to the project proponents. A detailed discussion of this complex and interlocking structure, and possible implications with respect to the public interest, is provided in Part 2, Section 2.2 of this report.

b) Impact on the Oil and Gas Industry

Volume 2, Section 1.6 and Appendix A “Market Prospects and Benefit Analysis for the Northern Gateway Project” prepared by Muse Stancil (the Muse Report) presents estimates of the impact Northern Gateway will have on the fortunes of the oil and gas industry in Canada. The Muse Report predicts a Net Canadian Benefit of \$28 billion Canadian (CAD) over the first ten years of the project's operation based on price increases it believes Canadian oil producers will be able to receive by redirecting some crude oil exports from Canadian and US markets to Northeast Asian markets.

c) Impact on the Canadian Economy

The third major level of economic analysis provided in *Volume 2 and Volume 6C Environmental and Socio-Economic Assessment (ESA) Section 4 Socio-economic Conditions* relates to the total estimated impact on the Canadian economy because Northern Gateway is built.

Volume 2 Appendix B “Public Interest Benefits of the Enbridge Northern Gateway Pipeline Project” prepared by Wright Mansell Research Ltd. (the Wright Mansell Report) incorporates an assessment of the impact on the Canadian economy Northern Gateway will have due to the construction and operation of the pipeline, as well as the impact on the economy from higher priced crude oil and the reinvestment of some of the proceeds from that higher priced oil.

The Wright Mansell Report incorporates an estimate similar to the Net Canadian Benefit as calculated by the Muse Report and expands it to a 30-year operating period. The Wright Mansell Report estimates the economic impacts arising from Northern Gateway between 2013 - 2046 using an Input-Output model (IO). The report concludes the project will create GDP growth of \$270 billion CAD, labour income of \$48 billion CAD, 558,000 person years of employment, and government revenues of \$81 billion CAD.

Volume 6C, Section 4 Socio-Economic Conditions, prepared by Enbridge, is in response to the obligations of the National Energy Board Act (NEB Act.) and the Canadian Environmental Assessment (CEA) Agency Act (CEA Act.) which require an Environmental Socio-economic Assessment (ESA) of the project.

The analysis in *Volume 6C, Section 4* restricts itself to an assessment of the impact on the Canadian economy from the construction and operation of the pipeline—no assessment regarding the impact of the pipeline on oil and gas industry net revenues is attempted in *Volume 6C*.

Forecast estimates of benefits to the public interest from growth in GDP, person years of employment and government revenues in Volume 6C arise solely as a result of the construction and operation of Northern Gateway as a transportation system. It is not clear why the proponent has presented a more limited approach than that undertaken by their consultants and presented in Volume 2.

Volume 6C, Section 4 concludes that the project's construction spending of \$5.5 billion over three years will increase GDP by a total of \$6.3 billion CAD, or \$2.1 billion CAD per year. Project operations will increase GDP by \$203 million CAD per year.

The approach undertaken in Part 1 of this report is to address the Enbridge Application by examining the project's macroeconomic consequences. Although Northern Gateway represents capital investment in, and ongoing operation of, a pipeline transportation system, it also represents an opportunity for the oil industry to raise oil prices for every barrel of oil the industry produces. The Enbridge Application aggregates these in the presentation of its estimated impact. This report disaggregates each category of impact to better appreciate their individual consequence.

What the Application fails to do is estimate the cost higher oil prices represent as they feedback through the Canadian economy. As a result of failing to provide the impact higher costs will have on the Canadian economy, the suggested benefits they present are grossly inflated.

A summary of the impact of Northern Gateway, as presented by Enbridge, is provided in Table 1. The relative contribution made to these estimates from higher oil prices is also identified. As is shown, more than 90% of the project's suggested value to the Canadian economy arises because Enbridge assumes Northern Gateway will create higher oil prices for all Canadian crude oil than would exist if the pipeline was not built.

Table 1

Estimated Economic Benefits of the Project

Economic Impact	Northern Gateway Estimate	Due to Oil Price Increase	Share from Oil Price Increase
GDP	\$270 billion	\$246 billion	91.00%
Additional Labour Income	\$48 billion	\$43 billion	90.00%
Person Years of Employment	558000	496687	89.00%
Government Revenue	\$81 billion	\$77 billion	95.00%

Source: Table 1-5 Volume 2 Section Enbridge Northern Gateway Application and Response to Federal Government IR No.1

Higher oil prices without any change in real economic activity, as is presented by the Enbridge case, by definition creates inflation. One of the reasons the inflationary impact from higher oil prices is so significant is because, although Canada is an exporter of crude oil, it is also an importer of crude oil. Imports satisfy almost half of domestic refinery demand. When refiners produce refined products, such as gasoline, jet fuel, diesel fuel, and asphalt, higher crude oil prices are passed onto Canadian consumers and business. This large dependency on foreign imported oil exists because there is inadequate transportation infrastructure to ship western Canadian crude oil supply to eastern Canadian

markets.

When the price of oil goes up, all refineries face higher prices and pass these prices onto businesses that uses petroleum products as inputs, and onto consumers. This results in a transfer of real income from consumers to producers and leads to unemployment and a decline in real GDP, particularly for non-oil related industry. Inflation also puts upward pressure on interest rates leading to a further decline in business investment and a higher cost for mortgages and other consumer debt. The full consequence of this reality, including its continuous feedback into the Canadian economy, year after year, must be included in the assessment of Northern Gateway.

Part 1 of this report reveals that when the “unseen” impact of Northern Gateway is included, the project will serve to permanently reduce GDP, increase unemployment, cause labour income to fall and decrease government revenues.

Part 2 of this report addresses specific categories of impact from a microeconomic perspective. This includes a discussion of the structure and financing of the project, the oil and gas industry's Net Benefit Calculation and the impact of the construction and operation of the proposed project.

The accuracy, reliability, presentation, and objectivity of the methodologies chosen, techniques selected and estimates derived in the Enbridge material is critiqued. Where practicable, alternative approaches for deriving a better understanding of the implications of this project have been presented.

Some of the comments in this report are constrained by lack of access to the actual models and materials available to Enbridge and its consultants. At the outset, it should be understood that information that has not been included in the Enbridge documents may be forthcoming during the JRP Hearings. This additional information may satisfactorily address some of the comments in this report. However, the most significant errors and omissions in the Enbridge analysis, as identified below, are readily apparent without access to further information from the proponent.

The purpose of this report is to address the desirability of Northern Gateway from a classical economic analysis perspective. Issues related to safety and direct environmental impact of the project are being addressed by others and thus this report is largely silent on these areas. However, insurance issues related to pipeline and marine terminal liability as a business and economic concern are raised and must necessarily include some discussion of risk, and potential costs from that risk, particularly as they relate to the environmental costs of oil and/or condensate spills.

The JRP has elected to disallow a full sustainability cost accounting framework to be considered in its review³ and therefore, the environmental costs of oil production as envisioned by Enbridge and western Canadian oil producers, will not be adequately addressed in evidence submitted to these Hearings. The Panel's reasoning behind that decision has been clearly explained and the scope of this report respects those guidelines. This report takes its parameters of analysis as set by the scope of the Northern Gateway Application.

3 https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624909/770171/A69_-_Panel-Commission_-_Ruling_no._4_-_Decision_no._4_-_Notice_of_Motion_from_Living_Oceans_Society_Raincoast_Conservation_Foundation_and_Forest_Ethics_-_A2J4Z7?no Although the request to exclude upstream benefits from consideration may be addressed in final arguments of the JRP hearings.

It should be noted, however, that the exclusion of environmental costs from oil sands exploitation, which are hugely significant to the public interest, places a full appreciation of the public interest case at jeopardy. That is, Enbridge is allowed to use the economic gains from potential future production to make its public interest case to the JRP, while the environmental costs that arise from this same projected production are explicitly excluded from being brought to bear on the discussion. The discussion of the macroeconomic impacts in Part 1 is where the inclusion of these impacts would most readily be included.

Notwithstanding the exclusion of a full accounting of the environmental costs from oil sands exploitation, as this report will detail, from the perspective of the economic impact on the Canadian economy, the Northern Gateway pipeline will create little, if any real benefit and is more likely to have long term, negative economic consequences.

Under some economic scenarios, particularly related to the Canadian-US dollar exchange rate—which could occur just as readily as the exchange rate scenario assumed by Enbridge—Northern Gateway could also represent an economic cost to the Canadian oil and gas industry.

Northern Gateway certainly threatens the long term stability of the Canadian economy and negatively impacts the standard of living for most Canadians. Thus, even excluding broader environmental concerns and a full accounting framework, the Northern Gateway project is not in the public interest of Canada.

A full and proper recognition and inclusion of any, or all, direct and indirect environmental costs related to oil production volumes used to develop Enbridge's public interest case, would underscore this conclusion and further worsen this project's negative calculus.

1.3 Economic Consequences of the Pipe

The purpose of the Northern Gateway pipeline project is to increase the price of crude oil for Canadian consumers. With the pipeline in place, Canadians will pay \$2 - \$3 more for every barrel of crude oil purchased in Canada, than without the pipeline—on every barrel, every year, for the next thirty years.⁴ The steady and prolonged impact of an increase in the price of crude oil over 30 years, as envisioned by Northern Gateway, has serious macroeconomic consequences.

The proponents for Northern Gateway—Enbridge and its Funding Partners including Sinopec Corp., Nexen Inc., MEG Energy Corp and Cenovus Energy Inc., along with Prime Minister Harper, Minister Oliver and Premier Redford, are suggesting that an increase in the price of oil is going to benefit the Canadian economy and the Canadian public.

Somehow this project is being presented as “nation building” when all available research, as well as the experience of most Canadians at the personal level, points to just the opposite. Higher oil prices mean a decrease in family purchasing power, higher prices for industries who use oil as an input into their production process, higher rates of unemployment in non-oil industry related sectors, a decline in real GDP, decline in government revenues, increase in inflation, and an increase in interest rates and further

4 Volume 2, Section 1.6 Project Need and the Public Interest.

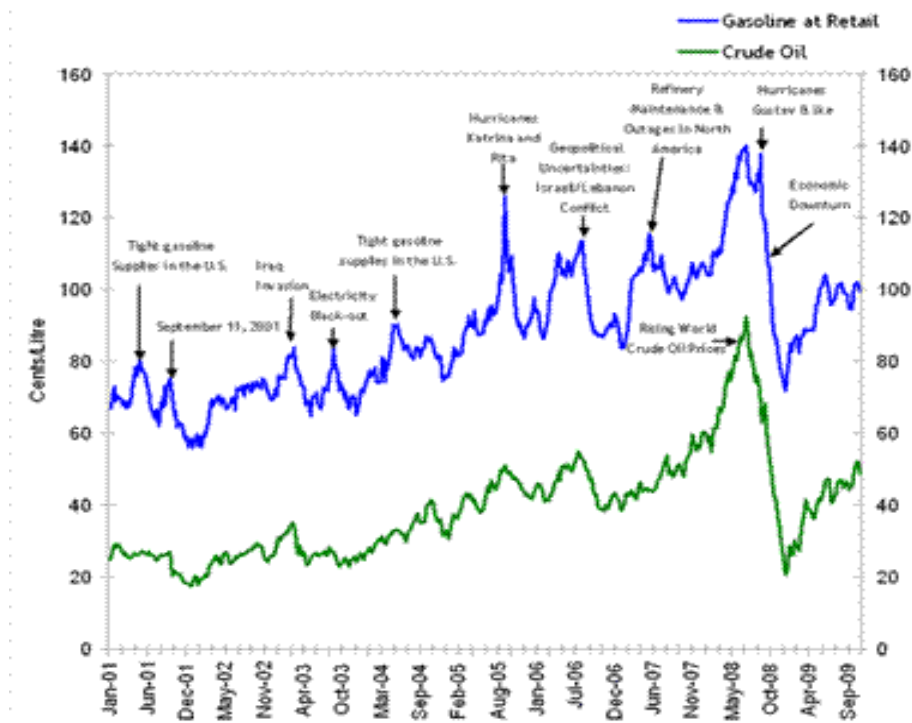
appreciation of the Canadian dollar.

The reason Northern Gateway's proposed increase in crude oil prices will be borne by consumers and industries that rely on oil as an input, is because oil price increases are passed onto refiners, who in turn pass the price increase directly onto their consumers. It is well documented that when refiners pay more for Canadian crude, they pass it on—at the pump, as fuel surcharges on plane tickets, higher transit fees, higher food prices—the price of just about everything goes up.^{5 6 7 8}

This relationship is clearly identified in Graph 1 which plots crude oil prices against regular gasoline prices in Canada from 2001 – 2009.

Graph 1

**Crude Oil and Gasoline Prices
Canada
2001-2009**



Source: Natural Resources Canada

Real incomes for most Canadians have increased very little over the past 30 years⁹. Given the growing inequality of incomes and the disproportionate share of income that flows to the wealthiest Canadians,

5 <http://www.nrcan.gc.ca/energy/sources/petroleum-crude-prices/1516> Graph of Canadian crude oil and gasoline prices January 2001 to September 2009.

6 <http://www.nrcan.gc.ca/energy/sources/petroleum-crude-prices/1298>
http://www.fin.gc.ca/toc/2006/gas_tax-eng.asp

7 http://www.wto.org/english/res_e/reser_e/ersd201002_e.pdf

8 http://www.bankofcanada.ca/wp-content/uploads/2011/10/BK2_scenario.pdf

9 <http://www.conferenceboard.ca/hcp/hot-topics/canInequality.aspx#anchor3> In the past 33 years real average income has gone up only 0.5% per year, while median income, due to increasing income inequality, has gone up by only 0.2%.

there is no reason to expect real income growth for most working Canadians over the life of the Northern Gateway pipeline.¹⁰ Therefore, consumers must respond to higher oil prices by shifting consumption from one part of their budget, to another. When that transfer in spending occurs, a decline in demand is felt among industries and within communities where the reduced spending takes place. These parts of the economy begin to contract and unemployment rises.

Other industries that rely on oil or refined products as inputs attempt to substitute away from oil based inputs, reduce their profit margins and/or raise their prices. This adjustment can lead to a decline in these industries production levels, and also result in layoffs. To the extent that rising costs for other industries lead to higher prices, exports can become more expensive and negatively affect Canada's balance of trade.

When the consequence of higher oil prices hit their second round effects, unemployment will go up in non-oil producing industries, leading to pressure on income support programs and a further decline in consumer demand. Coupled with higher interest rates than would exist without Northern Gateway, the cost of mortgages and other forms of consumer debt rises, forcing already highly leveraged consumers¹¹ to transfer a larger share of their limited budgets to banks and other financial institutions in order to pay their debts.

Higher interest rates also affect businesses who pull back on their investment decisions recognizing that the higher cost of business expansion, in the light of declining consumer demand, is risky. Job creation, and the income and opportunity that goes with it, is negatively impacted.

Northern Gateway is being advanced as an opportunity for economic diversification through expanded markets. The opportunity to realize and act on the benefits from market diversification is retained within the oil sector. The Northern Gateway pipeline will fundamentally ensure that the Canadian economy moves further away from a diversified base and closer toward a bi-industrial model: primary resource extraction backstopped by a sophisticated financial sector.¹²

Most Canadian consumers do not have room in their strapped budgets to bear the burden of oil price increases; particularly when those increases are purely a result of increasing price with no increase in productivity, value added or economic wealth. The price increase the oil industry hopes to capture is simply a transfer of income—mostly from Canadians who can ill afford it.

In fact, the price increase Northern Gateway hopes to realize is tantamount to a private sector levied tax on consumption, but instead of the revenue targeted for the good of the public interest (such as spending on housing, health care, or mitigating the effects of GHG emission) it is being channeled into the corporate treasuries of Canadian, foreign owned corporations, and corporations acting on behalf of foreign governments.

10 <http://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2010/12/Richest%201%20Percent.pdf>

11 <http://www.bankofcanada.ca/2011/12/speeches/growth-in-the-age-of-deleveraging/>

12 http://www.standardandpoors.com/servlet/BlobServer?blobheadname3=MDT-Type&blobcol=urldata&blobtable=MungoBlobs&blobheadvalue2=inline%3B+filename%3DFS_SP_TSX_60_LTR.pdf&blobheadname2=Content-Disposition&blobheadvalue1=application%2Fpdf&blobkey=id&blobheadname1=c The Canadian economy is already weighted heavily toward these two sectors as measured by the public equities market. Fully 57% of the TSX 60 is comprised of financial and energy stocks.

1.4 Inflationary Impact

Assuming a one year time frame and figures based on published 2009 data, a simplistic picture of the first round of an inflationary impact from an oil price increase of \$2.50/bbl on the Canadian economy is outlined below.¹³

This example illustrates that the benefit to oil producers of a \$2.9 billion gain comes at a cost of \$2.3 billion to the rest of the economy. The initial cost has significant adjustment consequences that must be fully integrated into any understanding of the impact of Northern Gateway on the Canadian economy. As well, this cost occurs every year the pipeline is operational, further underscoring the need to appreciate its potential consequences.

Table 2

Price Increase Impact – First Round	Billions
1. Oil Producers Revenue from \$2.50/bbl US Increase ¹⁴	\$2.5US
2. Producer Revenue Conversion to Canadian	\$2.9CDN
3. Oil Price Increase Borne by Canadian Refiners \$2.50/bblUS	\$1.6US
4. Refiner Cost Conversion to Canadian	\$1.8CDN
5. Toll Rates ¹⁵	\$0.5CDN
6. Price Increase Passed onto Canadians (Refiner and Toll)	\$2.3CDN
7. Net Benefit to Producers	\$0.6CDN

Higher priced oil, because of the import-export features of the Canadian economy, as this simple scenario illustrates, means that when the price of oil goes up on all oil produced because Northern Gateway is built, it costs Canadians. In this scenario, it takes \$2.3 billion borne by the Canadian economy for oil producers to realize \$2.9 billion increase in their revenues.¹⁶

To a limited degree, Enbridge identifies the impact of higher oil prices on Canadian refineries that use western crude oil and the increased cost of toll rates before it calculates a Net Canadian Benefit to input into its IO model. However, there are three problems with this.

13 Energy Statistics Handbook, Crude oil and equivalent – Supply and Disposition in Canada, Statistics Canada Table 4.1

Figures from 2009. This example is based on 2009 figures including exchange rate of 1.14 (or 87 cent Canadian dollar).

14 Selling Price of Oil produced in Canada increases \$2.50US per barrel: 2,725 kbb/d x \$2.5 US/b x 365 = \$2.5 billion US

Selling Price of Oil produced in Canada in Canadian dollars (1.14 times US Canada Exchange Rate 2009) \$2.9 billion CDN

Price increases of Oil consumed by Canadian refineries: 1,707 kbb/d x \$2.50 US/b x 365 = \$1.6 billion US

Price increase translated into Canadian \$ equivalent = \$1.8 billion CDN

Toll Rates (as pipeline capacity displaces capacity on other lines) \$434 US million x 1.14 = \$.5 billion CDN

Price increase passed onto Canadian consumers (refinery plus toll rates) **\$2.3 billion CDN**

Revenue earned by oil producers

\$2.9 billion CDN

Net Benefit to Oil Producers:

\$0.6 billion

15 Toll rates must be included as a direct cost as they have been excluded in the determination of netback prices. Volume 2, Appendix A, Muse Stancil Report, page 7

16 It is understood that some Canadian refinery throughput results in petroleum products that are exported to the US. For ease of discussion that has been absorbed by this example, since higher crude oil prices will increase the price of these refinery exports and negatively impact demand in these export markets in a direction similar to the inflationary impact on Canadian consumers.

The first is that it assumes prices only increase for western Canadian crude. There is going to be an impact on the price of all crude oil bought by all Canadian refiners because Northern Gateway is planning to limit supply in Canada and the US midwest and these markets will adjust. In 2016 the pipeline plans to redirect 23% of the supply that would have gone to Ontario and Quebec and 15% of the supply that would have gone to the US.¹⁷

The second problem arises with the Wright Mansell Report's translation of the Net Benefit calculation and how their estimate increases from \$28 billion, as estimated in the Muse Report, to reach \$264.1 billion. Wright Mansell uses \$264.1 billion as the industry benefit for input into the IO model. The details of the errors in the translation and its over-estimation are explained in Part 2, Section 2.4.1 of this report.

The more serious problem, however, is that the IO model is incapable of providing feedback when the economy attempts to adjust to higher prices—to inflation (details are provided in Section 1.6 of this report). Therefore results from the model present Northern Gateway as if it is without economic cost to the Canadian economy. Ignoring the feedback grossly misrepresents the impact of Northern Gateway on the economy—and suggests it is positive, when it is likely negative.

The Enbridge public interest case assumes that the same amount of crude oil is supplied with or without Northern Gateway and hence there is no new production that can be attributable to the project.¹⁸ A persistent increase in prices, without any real new production, is inflation. It is also a redistribution of income—a direct transfer of income—from consumers and businesses that use oil as an input, by way of refiners, to oil producers.

The first round transfer of income from Canadian consumers through Canadian refiners to oil producers—had Northern Gateway been operational in 2009—would have been significant as illustrated in Table 2. A similar transfer of income is forecast by Northern Gateway to occur each year over a 30 year time frame after Northern Gateway is built. Since prices adjust even before new pipelines come into service, the anticipation of access to Northeast Asian markets will raise prices well before the oil starts flowing to Kitimat. Canadians will begin to pay higher prices even before Northern Gateway comes into service.

Higher oil prices to Canadian consumers because of Northern Gateway seems like a perverse market outcome. Intuitively we would expect that a new transportation link, such as a pipeline, would lower consumer prices. If investment in infrastructure is not going to lead to improved productivity, why risk scarce capital resources, particularly since the project presents significant environmental risk from onshore and offshore oil spills.

The major reason lower prices are not expected with Northern Gateway is because the pipeline effectively transfers Canadian demand for oil from its current market realities to the market realities of rapidly developing countries. Demand for crude oil in the developing world is growing at a faster rate than energy demand in North America and therefore oil commands a higher price in those markets. Because there is limited access to these markets, the Canadian economy, in recent years, has become somewhat insulated from being completely subjected to world oil market price setting.

¹⁷ Muse Report Table A9 – 14.

¹⁸ Muse Stancil Table A-1 CAPP 2009 Growth Forecast.

Canada is an abundant source of energy supply, and although current crude oil imports represent about half of the crude oil we consume, there is excess supply being produced by oil companies in western Canada. This excess supply is being shipped to the US mid-west creating a crude oil glut and lowering the price as set through the benchmark West Texas Intermediate (WTI).¹⁹ Under normal free market conditions, producers would recognize the WTI price decline as a market signal—a message to slow down production. Not so with oil sands production. The preference is to restrict supply to the Canadian and US midwest market without sacrificing volume by channeling that volume along Northern Gateway to Northeast Asia.

Meanwhile, the pricing mechanism in Northeast Asia is determined by an historical relationship between Saudi Arabia, through its national oil exporter Saudi Aramco, and Northeast Asian markets. A premium—the so called Asia Premium—is charged Northeast Asian purchasers.²⁰ Northern Gateway would like to piggyback on this pricing premium. Since marginal price, rather than marginal or average cost determines crude oil prices, accessing Northeast Asian markets, where prices are higher, means that premium can be added to the price of crude oil sold in Canada and the US—hence the price of every barrel of oil produced rises even further than continued reliance on WTI or Brent pricing mechanisms.

The upshot of all this is that Canadian refinery demand for Canadian produced crude will have its market price determined as if the transactions for Canadian crude oil supply and demand take place in the Asian market. Canadians thus find themselves pushed onto an international demand curve that accepts higher prices—higher prices we will now be forced to face.

Northeast Asia accepts these premium prices partly because Saudi Arabia was selling oil to them when other producer nations were reluctant. They also accept a premium because the rapid pace of growth inherent in the early phase of industrialization makes it somewhat easier to absorb a higher price, particularly if international demand for their finished goods is strong.

The premium is also tolerated because China, the largest crude oil market, engages in price controls and can protect its consumers from higher prices while drawing on a large surplus of labour—people who are willing to work for very little pay and hence production costs for its exports are kept low.²¹

19 “WTI is a blend of crude oil produced in the fields of Texas, New Mexico, Oklahoma and Kansas. It is a pipeline crude and deliveries are made at the end of the pipeline system in Cushing, Oklahoma. As in the case of Brent, the WTI market is also characterized by a large number of independent producers who sell their crude oil to large number of gatherers. However, unlike Brent which is waterborne crude, WTI is pipeline crude and thus is subject to problems of logistical and storage bottlenecks. Brent is exportable which makes it more flexible and more responsive to trading conditions in the Western Hemisphere. Furthermore...WTI can show serious dislocations from other markets in some occasions, reducing its attractiveness as a global benchmark or even as a US benchmark”

<http://www.oxfordenergy.org/wpcms/wp-content/uploads/2011/03/WPM40-AnAnatomyoftheCrudeOilPricingSystem-BassamFattouh-2011.pdf> As we will see, however, WTI as a continued pricing benchmark is looking increasingly attractive when discussing the issue from the perspective of consumers rather than oil producers.

20 The Muse Report page 6 “The higher delivered cost (US\$1.60/bbl) is attributable to the “Asia premium charged by the Mideast national oil companies for crude cargos (sic) destined for Asia.” National oil companies are state owned companies like Saudi Aramco which is the world's largest energy supplier and owned by the Kingdom of Saudi Arabia. <http://arabnews.com/economy/article566330.ece>

21 <https://www.econstor.eu/dspace/bitstream/10419/50610/1/588107247.pdf> This report also explains that much of China's ability to absorb higher oil prices has been related to the fact that the demand for its exports have kept pace with higher prices for oil imports. The obvious concern for oil demand in the future is what occurs when the demand for Chinese exports stagnates.

Increased oil prices are not the only draw back when Canadian refiners are forced onto the world demand curve for oil. The pricing benefits we should expect from energy demand side management activities—conservation measures from changes in our consumption patterns like “recycling, reducing, reusing”—are washed away by the force of the international demand curve. Canadian consumption patterns are overwhelmed by the consumption patterns of a huge industrializing population. If we successfully conserve and continue to cut down our per capita demand for crude oil, the price will not fall commensurately because our demand actions, with Northern Gateway, will be overridden by Northeast Asian demand pressures.

It's difficult enough to deal with the economic costs of past energy strategies that connected western Canada crude oil to US markets at the expense of developing cross-Canada connections. This failure to link western supply with eastern demand has ensured that almost half our energy needs are determined by international markets—primarily Brent determined prices.

For some time now the price of crude as determined by WTI has been priced at a discount to Brent and other benchmarks—but eastern Canadian refineries have been unable to benefit from this price discount because westerly access to crude oil is limited. If Canadian crude oil producers were able to supply all Canadian oil refinery demand at a WTI determined price, we would be facing a very different pricing scenario and improved standard of living.

The main reason the Canadian economy has not felt the full impact of the rise in Brent oil prices is because of the value of the Canadian dollar has been appreciating. As the value of the Canadian dollar increases, refiners are hit less hard because oil is traded in US dollars; producers do not capture the full value of the windfall gain, and inflation is kept somewhat in check.

Non-oil producing industries face the brunt of the impact from an appreciating dollar. Under the exchange rate scenario Canada has experienced since 2003, a transfer of economic power has occurred from industrialized, largely eastern based provinces to natural raw resource extraction provinces—primarily Alberta. Northern Gateway represents an expansion in the pace and scope of that transfer and introduces a wave of inflation that we have not yet experienced.

Northern Gateway is about a redistribution of income from consumers and businesses that use oil and oil based products as inputs, to oil producers. Its about oil producers accessing international markets where demand is growing faster than supply, forcing prices upwards. As Stephen Wuori, President of Liquid Pipelines for Enbridge explained in October:

*“The victim is price. And that is what Northern Gateway pipeline is all about. It is not about whether you can move the barrels to the US, we can do that of course, but it is the price punishment that takes place when you have no other market available.”*²²

Unfortunately, Enbridge, on behalf of the oil industry, wants to transfer the impact of the price punishment they believe they have suffered largely onto Canadian consumers and other non-oil producing businesses. When they do—then its really going to hurt.

²² http://www.enbridge.com/InvestorRelations/~/_media/Site%20Documents/Investor%20Relations/ENBDay2011_Toronto_Transcript.ashx page 21

1.5 Measuring the Inflationary Impact

Enbridge was asked to comment on the impact higher petroleum products would have on the Canadian economy during round two of the written information requests. Enbridge responded that the higher price to producers “could have the effect of raising the price of gasoline slightly...the most likely impact would be an increase of about \$0.015 Cdn per litre of regular gasoline...its effect on food prices is expected to be negligible.”²³

This conclusion not only underplays the inflationary impact Northern Gateway will have, it also misrepresents it for a number of important reasons:

a) the impact of the price increase raises the price per barrel by about 2.3% - 3.5% each year—more than would exist without Northern Gateway²⁴—and the impact of this increase compounds as it is applied to all goods and services that use oil as an input;

One of the ways consumers respond to oil price increases is to pull back on major expenditures like housing and automobiles. Not only does Northern Gateway anticipate a rise in oil prices of between \$2 - \$3 per barrel, but the Muse Report assumes the real (inflation adjusted) price of WTI oil at Cushing in the period 2016 – 2025, to be 9.2% higher than during 2010 – 2015. Add the 2.3% - 3.5% on top of that increase and we have serious inflationary pressure.

b) oil price increases impact middle and low income households who “spend more than twice as much of their income on energy as do high-income households”²⁵

c) the price increase contemplated with Northern Gateway is a direct transfer of income from consumers to producers reducing the purchasing power of Canadians;

d) the consequences of inflationary pressures intensify the longer and more entrenched the price increase is: Northern Gateway is a minimum 30 year upward pressure on crude oil prices of between 2.3 - 3.5% per year, every year;

e) the track record for oil price forecasts are very poor. The inflationary impact of Northern Gateway could be much higher. Evidence submitted to the Hearings by the Government of Alberta—the Wood Mackenzie Report titled “*A Netback Analysis of West Coast Export Capacity*” suggests a price increase due to Northern Gateway of as much as \$8/bblUS for heavy crude oil exports from 2017 – 2025.²⁶ This represents roughly a 7% inflationary impact each year, for at least 10 years;

23 https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/763997/B43-10_-_Response_to_J._Wier_IR_No._5_-_A218L4?nodeid=763 page 76, page 80. J. Weir IR No. 5 p. 76 and the Federal Government in IR 1.13.17 a p.65

24 The Muse Report assumes an average price of oil between 2016 – 2025 of \$84.48. The \$2 -\$3 per barrel is added to this base price

25 <http://www.chamber.ca/images/uploads/Reports/2011/1106OilPrices.pdf> page 4.

26 <http://www.energy.alberta.ca/Org/pdfs/WoodMackenzieWestCoastExport.pdf> Evidence of the Province of Alberta. This analysis projects the price increase on heavy oil, not all oil as in the Muse Report, however, this still represents an increase in price of \$8 per barrel on about 75% of all oil forecast by them to be produced in 2017.

f) the Enbridge analysis does not incorporate the impact higher crude oil prices in the US will have on the demand for Canadian oil and non-oil imports. Higher prices will occur in the US because Northern Gateway assumes a restriction in supply of about 400,000bbl/d to US markets. US consumer demand is sensitive to price increases for refined products, particularly in light of recent economic developments;²⁷

g) inflationary pressures, regardless how mild, turn up the heat in the economy. Oil price increases, in particular, cause the Bank of Canada to respond by raising interest rates.²⁸

h) models capable of incorporating the inflationary aspect of higher oil prices on the Canadian economy predict permanent declines in GDP, job losses, lower labour income and government revenues, even with the positive impact of higher oil industry revenues included in the analysis.

The basic assumption in the pricing forecast for western Canadian crude in all recent reports advanced in support of Northern Gateway is that, for a given level of oil production, access to expanded Northeast Asian markets will result in higher crude oil prices.

Muse Report	\$2 - \$3 US per barrel
Alberta Department of Energy	\$8 US per barrel
Catching the Brass Ring ²⁹	\$10 US per barrel

With Northern Gateway, the oil industry in Canada is making decisions and taking action to ensure the price of oil goes up for every barrel they produce without any real change in production or efficiency. For the Canadian economy this means inflationary pressures, and although projections vary, this could represent inflationary pressures of between 2% - 10% each year, for decades, over and above what would exist in the absence of Northern Gateway.

“Typically, a sustained 10 percent increase in energy prices yields a 2-3 percent increase in the long-run price of most foods, with this relationship being stronger in high income countries that use particularly energy-intensive technologies³⁰

Canadians certainly do not want to irrevocably adopt a crude oil energy strategy whereby, as exporters of oil we become importers of inflation. The North American economy is on the mature stage of its industrialization curve and there are economic stabilizing benefits that come with that maturity. To willingly throw ourselves onto the growth trajectory of huge and developing nations, without due protection from the negative economic consequences, is not only unnecessary, it is extremely dangerous.

27 <http://www.fas.org/sgp/crs/misc/R41478.pdf> page 16

28 <http://www.bankofcanada.ca/wp-content/uploads/2010/02/wp09-33.pdf>

29 <http://policyschool.ucalgary.ca/?q=content/catching-brass-ring-oil-market-diversification-potential-canada>

30 <http://siteresources.worldbank.org/INTGEP/Resources/335315-1307471336123/7983902-1307479336019/Main-message.pdf>

1.6 Northern Gateway is an Oil Price Shock

Northern Gateway has been presented as a production, or wealth generating, growth shock, when Northern Gateway really represents an inflationary oil price shock.

Because the stimulus Northern Gateway presents has been misrepresented, IO modeling has been erroneously applied to estimate its impact. The Wright Mansell Report should not be considered as evidence of the public interest case.

The IO model used by Wright Mansell is the 2005 Statistics Canada Inter provincial Input Output Model. “An input-output model simulates the effect on the economy when overall output of an industry changes in a specific region or when final demand for a particular commodity changes in a specific region (these changes are referred to as shocks).”³¹

Wright Mansell uses the same CAPP 2009 Growth Forecast for supply in both scenarios: Northern Gateway and no Northern Gateway. This means that there is no change in the quantity of oil produced or the quantity of oil demanded—just a redirection of oil from the US and Canada to Northeast Asia, and hence nothing “new” exists to shock the model.

The distinction between actual physical output, and the price that output might receive in the market, is very important when conducting analysis using an IO framework. This is because the model is designed to deal with production, not prices. The IO model is a snapshot of the economy in 2005 with interdependent relationships among all industries based on the relative prices that existed in that year.

In 2005, for example, the average price of a barrel of crude was \$50.04.³² The IO model reflects the structure of the economy as it relates to how demand and supply in all sectors of the economy responded to a barrel of oil at the price. It then asks, “what would happen to economic activity if more oil was produced, or more oil was demanded, everything else constant”—not “raise the price of oil and see how that higher price would increase GDP, employment and government revenues.”

IO models can be very useful when used as intended to model the economy's response to possible changes in demand and supply conditions, and the effect that might have on a region or an industry. When we are trying to see what happens in the economy as a result of changes in relative prices, their usefulness is severely compromised because there is no feedback mechanism in the model. All impacts are seen as benefits, while the costs are largely ignored.

IO analysis takes as given an economic shock and assumes that the entire hit occurs in one year. That is, if we had injected an additional \$290 billion into the economy in 2005 (the figure the Wright Mansell Report employed) an additional \$270 billion in GDP would have occurred in that year. The increase the model predicts is then assumed to take place over the life of the project—ie from 2016 - 2046. A significant flaw in the logic exists—that is, increasing the price of oil by 50% and assuming the structure of the economy would be unchanged. If we had had a 50% increase in the price of oil in 2005, we would not have had the economic structure of the economy that existed in 2005.

IO analysis tries to represent what happens over time, but time itself is not part of the model—there is

³¹ Wright Mansell, op. cit., footnote 22.

³² http://inflationdata.com/inflation/inflation_rate/historical_oil_prices_table.asp This is the average price of US crude in US dollars. Adjusted to real 2011 figures, the value is \$57.50\US

no dynamic interchange and hence adjustments can not be included. An IO model is a static model which presents the economy at a point in time, much like a snapshot—but no one ever looks at a poster for a movie and believes they've seen the film.

Since IO models are static, and have no ability to incorporate feedback (ie coefficients are assumed to remain constant and production functions are linear) the nature of the input injected into them is critical to avoid misrepresentation of the output.

Statistics Canada's support information for use of its models is very clear on the nature of the shock that can be used.

Type of shock

An industry shock consists of a shock on the production of industries. This type of shock allows, for example, the analysis of the overall economic impact of an industry or to simulate the impact of a change in production levels.³³

The Wright Mansell Report tries to get around this limitation by estimating the direct price benefit as having no impact on employment³⁴ and then reinvests 40% of the gains from higher prices, as a proxy for corporate re-investment, back into the Canadian economy. This reinvestment activity is what is purported to create 496,682 of the 558,000 person years of employment attributable to Northern Gateway. What the model is incapable of identifying is the investment and person years of employment lost as consumers and companies attempt to adjust to higher oil prices. The empirical evidence suggests, that when both price gains and price losses are considered in a Canadian context, net new investment and person years of employment do not materialize, and in fact, permanent losses result.

The only way to begin to see the full impact of higher oil prices on the Canadian economy as represented by GDP, employment, labour income and government revenue, is to attempt to model the impact within a dynamic general equilibrium framework. A dynamic model, unlike a static model, is capable of weighing the gains and losses over a given time period. A general equilibrium framework allows us to see what occurs on all sectors of the economy as the shock of higher prices are borne as a cost by consumers and businesses using oil as an input. It allows us to see what IO analysis does not.

Using a dynamic stochastic general equilibrium model (DSGE) the OECD has concluded that the “strong and sustained rise in oil prices observed in recent years poses a challenge to monetary policy and its ability to simultaneously achieve low inflation and stable output.” It also concludes that a “sustained rise in oil prices has the potential to push inflation above its explicit or implicit target for some time, prompting central banks to react” by increasing interest rates.³⁵

Undertaking analysis through a global simulation model, the World Bank has found that oil price increases have adverse GDP impacts for all high income oil exporting countries because of the impacts in Canada and the United Kingdom. “(H)igh income oil exporting countries will see a fall in output,

33 User's Guide to the Canadian Input-Output Model, Statistics Canada, June 2009.

34 See Table A-2 The Wright Mansell Report Appendix B, Volume 2, Enbridge Application. Although analysts may want to attempt this approach in IO analysis to gain some insight, it is not an acceptable approach for identifying the impact of a price increase on the whole economy.

35 [http://www.oecd.org/officialdocuments/displaydocumentpdf/?cote=eco/wkp\(2008\)11&doclanguage=en](http://www.oecd.org/officialdocuments/displaydocumentpdf/?cote=eco/wkp(2008)11&doclanguage=en) page 2 and 5

largely driven by adverse GDP impacts in Canada...whose non-oil exports are negatively affected by slowing global demand.”³⁶ In this analysis undertaken by the World Bank it is acknowledged that the oil price shock is exogenously determined (outside of the Canadian economy) however, since Northern Gateway will raise the price of WTI through restricted supply, US refiners will face higher prices and this increase in the cost of their production will affect US demand for other Canadian exports. In this regard, the price shock anticipated by Northern Gateway has characteristics tantamount to an exogenous shock.

Employing a small scale macro model (SSMM)³⁷ that attempts to provide a limited general equilibrium framework to assess the response of the Canadian economy to an oil price shock, the Bank of Canada has also undertaken some work in this area.³⁸ Oil price shocks are seen to result in a permanent decline in real GDP and tend to elicit a response from the Bank of Canada to raise interest rates. “First, we find that higher oil prices have only small (but still statistically significant) effects on trend growth, but they lower the level of GDP permanently...oil price fluctuations have substantial macroeconomic effects...monetary policy reacts to higher inflation by raising interest rates..”³⁹

Although the size of the price shock impact modeled in the Bank of Canada report is a 10% increase over a short time period, a 2.3% - 3.5% price shock over a prolonged period would likely have more severe consequences.⁴⁰ That is, a 2% inflationary impact felt every year for five years is much more severe than a one-time 10% increase in oil prices. It should be noted that the Wood Mackenzie Report anticipates a roughly 7% increase in the price of heavy crude oil for 10 years (2017 – 2025); a very severe and prolonged negative impact on the Canadian economy.

In summary, by undertaking an IO analysis, Enbridge has utilized a misrepresentative methodology in their economic case for the proposed pipeline. They have therefore exaggerated outcomes from the development of the project. The price lift and its reinvestment can not be regarded as a reliable indication of what might happen. We need to be able to see how the Canadian economy, and its export markets for non-crude oil, react to higher prices.

A general equilibrium framework, which allows us to more effectively incorporate the negative impacts of higher prices on the Canadian economy, suggests that the impact of Northern Gateway would likely be negative. The higher oil prices it represents leads to greater inflation, higher interest rates, a permanent and prolonged decrease in real GDP, and a permanent decline in labour income, person years of employment and government revenues, than would exist if Northern Gateway was not built.

36 <http://blogs.worldbank.org/prospects/gdp-impact-of-oil-price-shock>

37 See <http://www.bankofengland.co.uk/publications/other/beqm/1999/chapter4.pdf> for discussion of SSMM's and their applications.

38 <http://www.bankofcanada.ca/wp-content/uploads/2010/02/wp09-33.pdf> How Changes in Oil Prices Affect the Macroeconomy.

39 Ibid., page 25. The authors point out some adjustment they see as necessary to better identify the Canadian economy's response to higher oil prices, but the results confirm the thesis that given Canada's unique import-export dynamic, oil price increases do more harm than good.

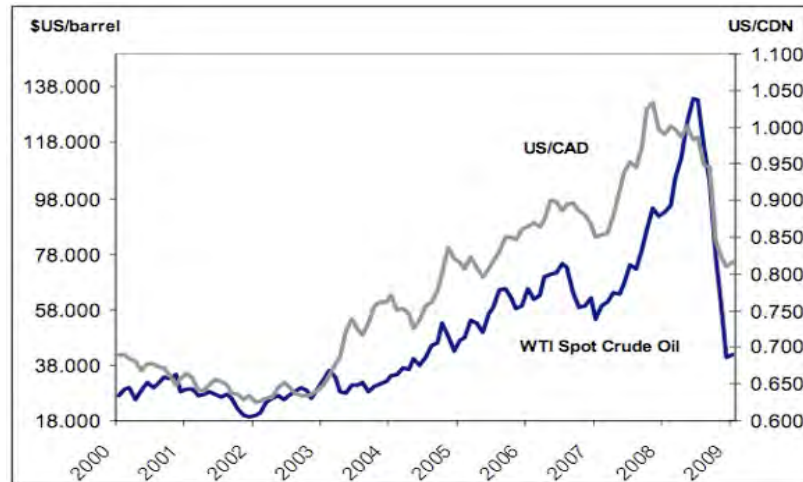
40 [http://www.oecd.org/officialdocuments/displaydocumentpdf/?cote=eco/wkp\(2008\)11&doclanguage=en](http://www.oecd.org/officialdocuments/displaydocumentpdf/?cote=eco/wkp(2008)11&doclanguage=en)

1.7 The Dutch Disease

There has been concern expressed over the possibility that the Canadian economy is showing signs of the Dutch Disease whereby the exploitation of natural resources leads to a decline in manufacturing output. The main symptom of the Dutch Disease is a rapid appreciation in the currency from raw resource sales and foreign direct investment. The Canadian dollar has appreciated significantly against the US dollar since 2002, in concert with rising WTI.

Graph 2

The Canadian Dollar and Rising Oil Prices
2000 – 2009⁴¹



In Canada, this means the booming oil sector's impact on the Canadian dollar has caused manufacturing, tourism, agriculture, and natural resource industries (who sell their products in Canadian dollars, such as forestry), to suffer significant challenges with respect to retaining profitability and employment. A pure Dutch Disease situation is generally related to the manufacturing sector only, however, in Canada it may more appropriately be extended to the impact on all activity that involves foreign demand for our goods and services.

In J. Weir's IR No.7, Northern Gateway was requested to “describe how the “Dutch disease” will be avoided in Canada with this project.”⁴² Northern Gateway's response was dismissive in that the proponent suggests that “it is unreasonable to expect any broad or significant elements of Dutch Disease as a result of the Project”.

To the extent that the Dutch Disease does exist in Canada, Northern Gateway represents an entrenchment of the syndrome. The project promises a sustained increase in the price of crude oil which will serve to appreciate the Canadian dollar, raise inflation and interest rates. Those pressures will work negatively on Canada's other exporting sectors to decrease output and employment further.

Numerous studies have been undertaken and the majority have concluded that the phenomenon of the Dutch Disease is real in Canada. It has been suggested that the Canadian dollar could be considered a

41 <http://thetyee.ca/Opinion/2010/08/13/TarSandsEconomicFate/>

42 Information Request #7 J. Weir 7-2.

“petrocurrency” and this pressure is responsible for the loss of a significant number of manufacturing jobs.⁴³ As well, studies have pointed to the fact that a rapidly appreciated dollar dramatically reduces the breadth and resiliency of the business sector, making our economy dependent on high commodity prices and exacerbating regional tensions in the country. Close to 95% of Canada's oil reserves are located in Alberta while 75% of manufacturing output is produced in Ontario and Quebec.⁴⁴

The strategy envisioned by Northern Gateway is to increase Canada's dependency on commodity prices. Once the lucrative Northeast Asian market has been accessed—at significant cost to Canadians and at significant increased environmental risk—what happens when China's economic boom becomes a bust? Canada will have sacrificed an opportunity to build value added refinery capacity, and will have prolonged the negative impact from a falsely appreciated dollar on, not only the industrial sector, but on agriculture, tourism, forestry and other sectors of the economy struggling to remain competitive.⁴⁵

To point to the Dutch Disease as the reason behind Canada's current economic challenges is to simplify the situation. Although it is occurring, the Dutch Disease does not adequately address important issues of income inequality and reduction in the standard of living for many Canadians as spending power is transferred from consumers to multinational oil producers.

Neither does the Dutch Disease adequately address the challenges facing Canada's agricultural industry, its forestry and other natural resource sectors that conduct trade in Canadian denominated prices nor the unique impact a high dollar has on Canada's tourist industry and other service activities.

The Dutch Disease does not explain the degree to which a weakening US dollar has contributed to our unique challenges, and hence the extent to which declining real incomes in the US are responsible for declining demand of Canadian exports in non-oil sectors.

The relative contribution of the appreciating Canadian dollar as compared to the depreciation of the US dollar has been explored. Less than half of the sharp appreciation of the Canadian dollar between 2002-2008 can be attributable to rapid upward pressure from within Canada, with 48% of the appreciation of the Canadian dollar due to the declining value of the US dollar.

“Using our decomposition, we show that the appreciation of the CAD explains about 42% of the sharp appreciation of the CAD/USD exchange rate over the 2002-2008 period. The sharp depreciation of the USD over the same period explains the rest of the appreciation of the CAD/USD exchange rate. In turn, both evolutions are responsible for the losses in the Canadian manufacturing sector, with roughly similar quantitative effects but with some differences at the industry level. All in all, this allows us to assess the extent to which the Canadian economy has been subject to the Dutch disease in the recent period. It is also clearly shown that the depreciation of the U.S. dollar worsened the situation. Analysis failing to account for this last evolution are likely to yield a deformed picture of the situation and in turn to lead to inappropriate policies...the

43 <http://www.parl.gc.ca/Content/LOP/researchpublications/prb0586-e.htm>
http://www.queensu.ca/sps/facultyresearch/faculty/courchenet/Loonie_and_the_Dutch_Disease.pdf
http://www.desjardins.com/en/a_propos/etudes_economiques/actualites/point_vue_economique/pve61011.pdf

44 <http://www.irpp.org/po/archive/nov11/bimenyimana.pdf>

45 <http://opinion.financialpost.com/2011/04/16/canadas-case-of-dutch-disease/>

*Dutch phenomenon becomes a disease if the manufacturing sector does not rebound when the resource boom is over.*⁴⁶

Therefore, care must be taken when evaluating the negative consequences of rapid oil sands development and its impact on the Canadian economy. We must be able to understand the consequences of our development strategy and its net impact on the Canadian economy as well as the impact of economic developments in the world going on around us.

Although the Dutch Disease is not totally responsible for our current decline in manufacturing growth and employment, it does play a role. The crowding out of Canada's manufacturing sector will be more intense with Northern Gateway than without it, as will the upward pressure on the Canadian dollar.

1.8. Evolving Up the Supply Chain

Before we leave the macroeconomic discussion it is worthy to note that the project, as envisioned, assumes no new refining capacity in Canada. The underlying assumption is that investing in value added activity, such as expanded production of petroleum products, will not benefit the oil and gas industry—rather the benefit to Canada's oil and gas industry is maximized by extracting and exporting raw crude oil.

There is no question that producing more petroleum products in western Canada could reduce the need for crude oil pipeline transportation capacity and with it a significant reduction in oil spill risk. It is also very clear that the employment generation from refining petroleum products is much greater than raw resource extraction and export.

At this stage in Canadian energy policy we are relying on the private sector to determine the cost-benefit of investing in value added capital improvements to enable refineries to process heavy bitumen crude oil. They are choosing to make these investments outside Canada. Extensive investments to upgrade refineries so they can use heavy oil have been made in the US, and in Northeast Asia. The foreign ownership features of the Canadian industry might have more to do with the lack of value added in the Canadian economy than the actual economics of value added do.

The private sector does not need to internalize a significant portion of the environmental risk in its corporate cost-benefit analysis, nor the benefits from employment generation that manufacturing petroleum products represent, as distinct from exporting raw crude. This raises the question as to whether the public interest in Canada can be adequately served by private sector decision making.

Related to this aspect of shipping raw bitumen to China, Prime Minister Harper announced on September 26, 2008 that his government, if re-elected, would prohibit bitumen exports to countries that don't have emission reduction targets equivalent to Canada's. "More than just an energy provider, Canada must be a clean energy superpower."⁴⁷

46 <http://www.michelbeine.be/pdf/Does%20the%20canadian%20economy%20suffer%20from%20dutch%20disease.pdf>

47 Shaun Polczer, Calgary Herald, Saturday, September 27, 2008.

Prime Minister Harper said the policy wouldn't affect current contracts with US refiners, but said it could jeopardize future exports to Asia. Federal Environment Minister, Jim Prentice reconfirmed this policy in June 2010, subsequent to the submission of the Enbridge Application. He stated that:

*“Our policy is not to prohibit bitumen exports to China. Rather, we've said we don't want to see carbon leakage, we don't want to see a loss of Canadian jobs. And we would not want to see our bitumen exported, in its raw form, to any country that has lower environmental standards than Canada...We said very clearly that we don't want to see people circumvent Canadian environmental requirements by shipping (raw bitumen) to a country that has lower standards”*⁴⁸

Clearly most independent observers would conclude that to avoid carbon leakage and a loss of Canadian jobs, environmental standards in Asia would have to be significantly increased before any raw bitumen exports would be permitted. It is unclear how the federal government intends to enforce its announced policy in this area.⁴⁹

This raises the question on the degree to which foreign ownership and control exists in the Canadian oil industry and what “Benefit to Canada” national policy must be considered when evaluating decisions being made in the development of the industry.⁵⁰ Statistics Canada reports that in 2009 fully 35% of assets and 41% of profits were controlled by foreign interests.⁵¹ These figures have increased since, with foreign corporations, some controlled by national governments, purchasing oil sands properties and projects. In the past three years billions have been spent by US, French, British, Korean, Norwegian and Chinese companies to gain control over crude oil assets.

More recently Chinese national oil companies have undertaken an aggressive purchase of oil reserves in Alberta. These purchases are in an effort to complete their strategy of gaining control over all stages in the supply chain—from oil production in Canada, to extensive refining operations in China and Saudi Arabia, to product distribution networks including retail gas stations throughout China. Sinopec is also a Funding Partner in the Enbridge Northern Gateway pipeline project which adds another link in the chain—ownership rights in a transportation system to get the crude oil out to Northeast Asia.⁵²

The reality of significant foreign ownership in the Canadian oil industry is also reflected in the fact that many are intervenors in this regulatory process, including companies such as BP, Imperial Oil, Imperial Oil's parent ExxonMobil, Japan Canada Oil Sands, ConocoPhillips, Inpex and Sino Canada. Furthermore, although the proponents indicate that Enbridge is a Canadian company, 5 out of 12 of the corporate board of directors, including its Chair, are US citizens.

48 <http://money.canoe.ca/money/business/canada/archives/2010/06/20100625-152503.html>

49 <http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/ottawa-puts-up-barrier-to-sinopec-bitumen-exports/article1534790/>

50 http://www.ic.gc.ca/eic/site/ica-lic.nsf/eng/h_1k00007.html The Investment Canada Act does not seem to have been effectively supporting appropriate vetting of foreign investments in recent experience.

51 <http://www.statcan.gc.ca/daily-quotidien/111013/t111013b1-eng.htm>

52 Petro China in 2009 purchased 60% of the Athabaska's Oil Sands Corporation's MacKay River and Denver projects. Sinopec in 2010 paid \$4.7 billion for ConocoPhillips stake in Syncrude with veto power on whether the company should upgrade bitumen here or export it to China. The China Investment Corporation then took possession of a \$1.3 billion share of Penn West Petroleum. In 2011 the Chinese National Offshore Oil Corporation purchased Opti Canada for \$2.3 billion and Sinopec spent \$2.2 billion to take over Daylight Energy. Finally Petro China with a \$2 billion purchase became the owner and manager of the MacKay River Oil Sands Project.

Companies, like Cenovus, also a Funding Partner in the Northern Gateway pipeline project, see the benefits of a fully integrated heavy oil business. As a 50% joint venture partner with ConocoPhillips, the company operates crude oil sands projects in Alberta and two refineries in the US—Wood River, Illinois and Borger, Texas. In 2007 the Borger refinery was upgraded to allow the refinery to process heavy oil blends, while in 2011 a \$3.8 billion US expansion of the Wood River refinery was undertaken to enable expanded heavy oil upgrading capacity.

There is an extensive oil and gas industry in Canada, but this should not be confused with a Canadian oil and gas industry. The decision making criteria regarding the best and most efficient way to maximize multinational corporate interests and the interests of nationalized companies operating on behalf of foreign countries, is not necessarily compatible with the decision making criteria which would be brought to bear on developing an oil resource strategy that serves the Canadian public interest. By not assuming its proper responsibility, the federal government has abdicated its leadership role in ensuring there is a national energy policy for Canada that benefits Canadians.

The federal government is leaving the value added investment decisions to multinational interests whose first obligation is to their shareholders, whether these shareholders are other corporations, investment firms and funds, private individuals or other national governments. These companies see the benefit of controlling all stages in the supply chain, but find no compelling need to ensure the benefits are realized in Canada. As a result, they have decided Canadian assets will be limited to a subservient position as the initial stage of a value added supply chain—raw resource extraction.

It is often stated that Canadian oil sands reserves are third to Saudi Arabia and Venezuela. What is rarely discussed is the active role the Saudi Arabian and Venezuelan governments play in the determination of the most efficient and effective exploitation of those reserves for the overall benefit of their country. Saudi Aramco, the largest oil producer in the world is a Saudi nationally owned company that has pursued an aggressive strategy to control all stages of the supply chain from extraction, to refining, to sales and distribution throughout the world.

Among Saudi Aramco's activities is extensive ownership of refinery capacity and gasoline distribution in the US through its half ownership of Motiva Enterprises. Through Motiva, Saudi Arabia owns 7,700 Shell gasoline stations, 41 refined product storage tanks, and three refineries with a capacity of 740,000 bbl/d.⁵³ Saudi Aramco's business partner is Shell Oil. They own and operates three refineries—one in Texas and two in Louisiana. The Houston refinery recently announced that it would purchase all its crude from Saudi Aramco when its refinery capacity is expanded to 600,000 bbl/d later this year.⁵⁴

As well, Saudi Aramco and Sinopec, a Funding Partner of Northern Gateway, have recently announced their plans to build a refinery in Yasref in order to process 400,000 bbl/d of heavy crude.

⁵³ <http://www.motivaenterprises.com/home/content/motiva/about/> Given Saudi Aramco's direct involvement in the US economy it is difficult to understand how any argument regarding “ethical” oil could gain any attention. Coupled with the fact that about 49% of all crude imports into eastern Canada come from OPEC countries, it could be advanced that if the federal government has a concern over “ethical oil” the needs of eastern Canada should take precedence over any other transportation option. Finally, direct participants in the Northern Gateway project have direct partnership ties with Saudi Aramco, including Total SA and Sinopec.

⁵⁴ <http://royaldutchshellplc.com/2011/06/10/saudi-arabia-to-be-motiva-texas-refinerys-sole-supplier-source/> It is an interesting question as to how Alberta oil can be advanced as ethical oil when Saudi Arabia is a primary, and in some cases, a sole supplier and refiner in the US. (*should we include this reference?*)

“Yasref is uniquely placed to seize market opportunities, and it demonstrates our unwavering commitment to significantly grow our downstream portfolio, and in creating win-win partnerships for us and our stakeholders,” Khalid A. Al-Falih, president and CEO of Saudi Aramco, said. “Among Yasref’s many contributions will be to provide training, employment and industrial and economic development opportunities for Saudi nationals and for the growth of local enterprises.”⁵⁵

This development is in keeping with Saudi Aramco's plan to expand its refining capacity to eight million barrels per day over the next decade.⁵⁶

As well, Sinopec, the Chinese national oil company has embarked on a deliberate strategy to secure each stage of the supply chain, including the ability to own and export crude oil from Canada. It is interesting to note, that although Sinopec sees the advantage of investment in refining capacity, it does not see the advantage of supporting this refining capacity in the Canadian context, and even ensured in its negotiation with Syncrude, that it have veto right over refining crude oil in Canada.⁵⁷

Northern Gateway means more than inflation and a reduced standard of living for Canadians. It represents lost opportunity to gain control over the value added supply chain and ensure permanent and meaningful jobs are created within Canada. It also represents the willing abandonment of Canadian energy security and an abdication of national energy policy by federal and provincial governments—energy security and national policy benefits foreign nationals readily appreciate.

55 http://www.process-worldwide.com/management/project_management/articles/345377/

56 <http://arabnews.com/economy/article566330.ece>

57 <http://www.afl.org/index.php/May-2011/who-owns-our-oil-sands-foreign-corporations-stake-their-claims-to-our-resources.html>

Part 2. A Microeconomic Analysis of The Northern Gateway Case

2.1 Introduction

Part 2 of this report discusses and evaluates the Northern Gateway economic case and incidence of impact of the proposed pipeline on the public interest from a microeconomic perspective as it relates to:

- i) Proponents (Enbridge Inc., as majority owner of Northern Gateway Limited Partnership, its Funding Partners and potential investors);
- ii) The Oil and Gas industry (as specifically represented by the Muse Report Net Canadian Benefit Calculation); and
- iii) The Canadian economy (as specifically represented by the Wright Mansell Report and Volume 6C ESA analysis).

The approach taken in this part of the report is to identify important information and consequences that have not been discussed or disclosed in the Enbridge documents and the implications the absence of this intelligence has on their conclusions.

As well, an examination of the reliability and usefulness of the methodologies chosen by Enbridge is undertaken, including a discussion of the application of these methodologies to develop a reasonable business and economic case.

The absence of alternative scenarios and adequate sensitivity analysis in the economic case is discussed. All models are dependent on assumptions. Decision makers and the public need to understand how changes to key underlying assumptions might impact the economic case as advanced by Enbridge. Without clearly knowing what assumptions have been made, and how changes to those assumptions affect the output from the models, any meaningful understanding of the reliability of the economic case, or achievability of the economic benefits, is impossible.

Whereas Part 1 of this report identified the serious and negative consequences of oil price increases on the Canadian economy, this part of the report addresses the situation whereby the price increases might not be achieved, and because more than 90% of the Need and Public Interest Case is built on the achievement of higher prices, should they not occur the Public Interest Case all but disappears.

2.2. Impact of Proponents

2.2.1 Project Financing and Structure

Northern Gateway pipeline is being developed by Northern Gateway—a limited partnership formed under the laws of Alberta, with Enbridge Inc. as its first limited partner and Northern Gateway Pipelines Inc. as general partner.⁵⁸ Northern Gateway would provide the oil and gas industry with access to a west coast marine terminal in Kitimat, BC, via time and space on its

⁵⁸ Volume 2 Op. cit, page 4-1.

crude oil pipeline and access to condensate supply from offshore via time and space on the condensate pipeline .

In order for the project to be viable, it's essential Northern Gateway have committed shippers enter into long-term agreements to pay for capacity on the pipelines.⁵⁹ Enbridge previously attempted to secure these contracts as early as 2004, but regulatory approval was uncertain and potential shippers were reluctant to commit.

Stepping back from this approach, Enbridge, on behalf of the project, developed a process for potential shippers (primarily oil producers in Canada, condensate exporters in other countries, and refiners in Northeast Asia) where they could partially finance Enbridge's predevelopment costs, including its public review process with the NEB. Northern Gateway raised \$100 million from ten Funding Partners who paid \$10 million each.

Only four of these Funding Partners have identified their involvement including Sinopec owned by China Petrochemical Corporation one of the three largest oil companies owned by the Chinese government, Cenovus Energy Inc., Nexen Inc., and MEG Energy Corp. (owned in part by China Overseas Oil National Company (COONC), one of China's three main national oil companies owned by the Chinese government).

By assisting with the financing of the predevelopment phase of the project, which consists primarily of the NEB review process, the Funding Partners receive an option to secure—at a special Funding Partner toll rate—up to 50,000 barrels per day oil capacity on the pipeline, up to 17,500 barrels per day condensate capacity on the condensate pipeline, an option of up to 4.9% equity ownership in the project and a pro rata share in the form of future transportation credits of 75% of revenue collected from non Term Shippers.⁶⁰ This structure would see Northern Gateway retaining 51% ownership in the project through its relationship with Northern Gateway Inc., while other investors would control a total of 49% ownership in the project.

Recently Northern Gateway confirmed that *“One Funding Participant has a further option to purchase their equity in the form of direct ownership...allowing for direct ownership of portions of the asset.”*⁶¹

It is not clear who this funding partner might be, but given Sinopec's commitment from very early on in the project, it is quite possible an option to secure ownership rights to the pipeline may have been granted to them. Therefore, if such an option were exercised, the government of China would have a direct stake in a pipeline transportation system in Canada to secure security of supply for Chinese citizens, while the Canadian government is reluctant to develop an energy strategy for Canadians that would ensure the same commitment to security of supply.

59 Section 2, Commercial Considerations, Page 2-1.

60 Subject to dilution to accommodate Aboriginal equity investment.

61 Response to JRP IR No.9 January 25, 2012. www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/784863/Northern_Gateway_Pipelines_LP_-_Northern_Gateway_Response_to_JRP_IR_No_9_-_A2L4S2.pdf?nodeid=784867&vernum=0 Page 6

Even if direct ownership over the asset is not held by the Chinese government, two of the potential equity investors in the project directly or indirectly represent companies owned by the Chinese government.

Limited partnerships are a special form of partnership often used when parties to a joint venture wish to limit liability for potential debts of the enterprise and access the preferential tax treatment that comes from this form of business structure. When a limited partnership is formed, one of the partners is designated as the general partner and all other partners are limited partners. The partnership agreement sets out the terms of the relationship. The general partner is responsible for managing the business of the partnership while the limited partners have no control over the business activities of the partnership. It is this lack of involvement in decision making that enables limited partners to retain their limited liability status.⁶²

Any income earned by the limited partnership is directed to, and taxed in the hands of, the partners while any losses incurred by the limited partnership are similarly allocated to all partners. With respect to potential large losses, such as may occur with an interruption of business from an oil spill, limited partners are restricted in their ability to deduct losses, and in aggregate cannot deduct losses which exceed the extent of their investment.

If a limited liability partnership is unable to meet financial obligations, such as could arise from inadequate pipeline throughput demand, or from a major oil spill, the general partner becomes liable for the debts of the partnership. It is not clear whether Enbridge Inc. is insulated from potential liability if the general partner—Northern Gateway—is, for any reason, unable to meet its current or future obligations.

Clearly establishing the containerization realities of the ownership structure as envisioned with Northern Gateway is very important for a number of reasons including the economic cost-benefits of a potential pipeline leak. Unless information to the contrary is provided, the JRP should assume that the business structure protects Enbridge Inc. from potential obligations of the general partner, Northern Gateway Pipelines Inc.

Enbridge has used complex limited liability structures before, in particular with its creation of Enbridge Energy Partners LP (EEP; shown as the oval in the organization chart below) and its management company, Enbridge Energy Management LLC.

Enbridge Energy Management LLC (EEQ) is a publicly traded limited liability company that manages and controls the business affairs of Enbridge Energy Partners LP (EEP). Both EEQ and EEP are publicly traded on the New York Stock Exchange (NYSE). EEP is the master limited partnership, headquartered in Houston Texas, and owns petroleum and natural gas midstream businesses—including the US portion of the Lakehead Pipeline system.

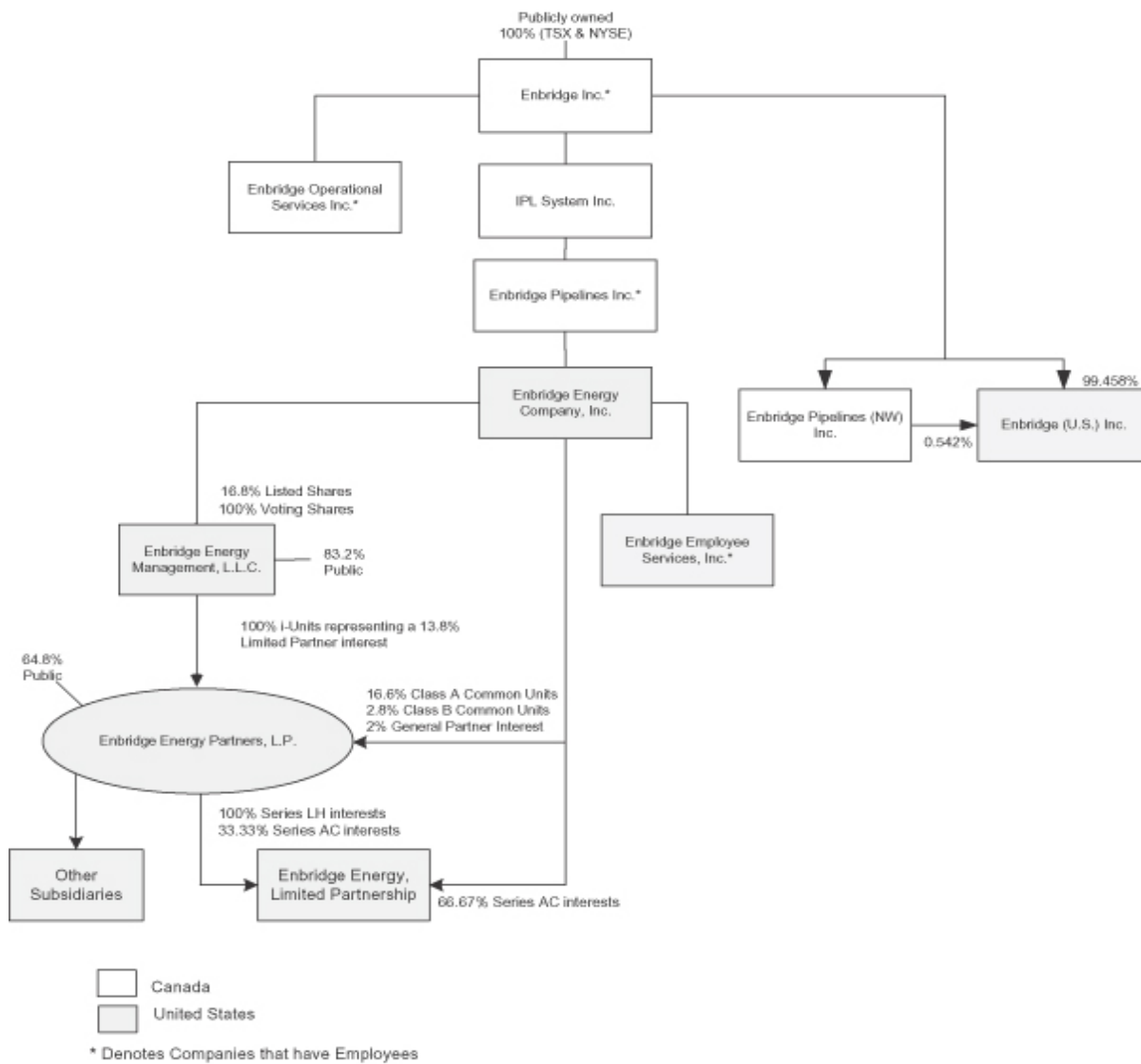
The Lakehead Pipeline system primarily transports crude oil from Western Canada to the US and Canada serving all major refining centres in the Great Lakes, the Midwest and Ontario. The Lakehead system currently meets the crude oil needs of approximately 75% of the refining capacity in Minnesota, greater Chicago, and Ontario. Line 6A and Line 6B, the source of two

⁶²http://www.umanitoba.ca/afs/agric_economics/MRAC/structures.html

oil spills in 2010, are part of the Lakehead Pipeline system.⁶³

Chart 1

Current Organizational Chart Enbridge Inc.



Unless otherwise noted, each subsidiary depicted above is 100% owned by its direct parent. Source: US Securities and Exchange Commission filing EEP December 2011⁶⁴

The only investment that Enbridge Energy Management LLC has is its limited partner interest in Enbridge Partners, and the success of Enbridge Energy Management LLC is dependent on the financial performance of Enbridge Energy Partners (EEP).

63 <http://response.enbridgeus.com/response/main.aspx?id=12780> Line 6B is a 30-inch, 283,000 barrels per day (bpd) line transporting light synthetics, heavy and medium crude oil from Griffith, Ind., to Sarnia, Ontario.

64 <http://app.quotemedia.com/quotetools/showFiling.go?webmasterId=92185&name=ENBRIDGE%20ENERGY%20PARTNERS%20LP-%20424B2-%20Sub-Doc%201-%20Page%207&link=http%3A//quotemedia.10kwizard.com/filing.xml%3Frid%3D23%20>

As a result of the issuance of shares to the public, the disclosure of information requirements for Enbridge's US pipeline facilities are governed by US securities law and some information useful for this discussion is provided in documents filed with the Securities and Exchange Commission (SEC) for both EEQ and EEP.

Enbridge Inc. holds approximately 26% interest in EEP through its US subsidiary Enbridge Energy Company Inc., the general partner. It also maintains additional ownership indirectly through the general partner that holds 16.8% of EEQ, which then owns 13% interest in EEP.

Given Enbridge's complex partnership structures, and its desire to provide corporate management services as appropriated charges, there are significant conflicts of interest and conflicts of fiduciary responsibilities which are regularly revealed to shareholders in various documents filed with the SEC. A recent prospectus filed in the US explains this situation:

CONFLICTS OF INTEREST AND FIDUCIARY RESPONSIBILITIES

Conflicts of Interest

Enbridge indirectly owns all of the outstanding capital stock and elects all of the directors of Enbridge Energy Company and Enbridge Management. Enbridge has a number of interests that differ from those of our unit holders. As a result, there is a risk that important business decisions will not be made in your best interest. You should carefully consider the discussions of these conflicts of interest in our Annual Report on Form 10-K for our fiscal year ended December 31, 2010.

Fiduciary Duties Owed to Our Unit holders

The fiduciary duties owed to the owners of our units by our general partner and its board of directors are prescribed by Delaware law and our partnership agreement. Also, as a result of the delegation of control by our general partner, Enbridge Management's board of directors could be held to have fiduciary duties similar to our general partner. The Delaware Revised Uniform Limited Partnership Act and the Delaware Limited Liability Company Act provide that Delaware limited partnerships and Delaware limited liability companies, respectively, may, in their partnership agreements and limited liability company agreements, as applicable, restrict the fiduciary duties owed by their general partner to their limited partners and by their board of directors to their shareholders.⁶⁵

Without direct access to the partnership agreement it is very difficult to determine the exact features of the proposed Northern Gateway Partnership and how certain aspects may impact the transportation industry, oil and gas industry, and Canadian economy. However, a number of issues need to be raised because the unique structure of the proposed partnership, particularly with investors who are also shippers, needs to be fully appreciated. It may only be possible to get these issues clarified by direct access to partnership and other agreements.

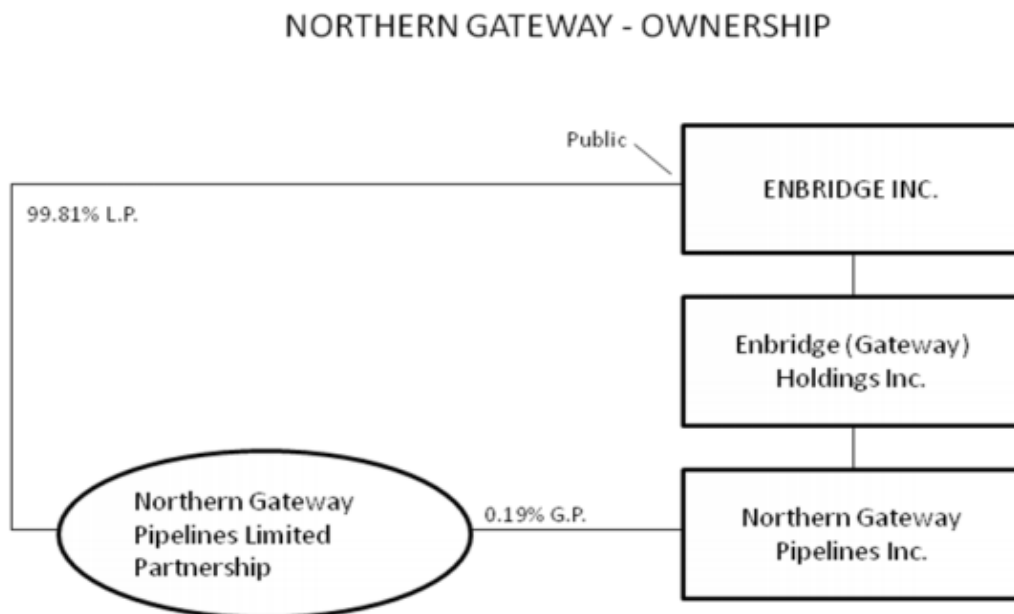
To the extent that the partnership agreements entered into limit Enbridge's fiduciary responsibility, or protect it from the normal obligations usually entertained with a corporate form of organization, this needs to be fully addressed. Assurances of a company's willingness to lift the corporate veil, as say, in the instance of an oil spill that exceeds insurance coverage

⁶⁵ http://www.totalmerrill.com/publish/mkt/prospectus/pdfs/RED_EEP_Jun2011.pdf Page S-14 and S-15

and the ability of the limited partnership to meet the costs, is not enough. There needs to be legal and binding obligation otherwise the public interest risk is increased substantially.

The proposed structure of the Northern Gateway LLP and how it relates to Enbridge is provided below.

Chart 2



Northern Gateway Pipeline's Inc is the General Partner and is a corporation.⁶⁶

It is common practice for limited partnership arrangements to incorporate in offshore jurisdictions in order to limit tax exposure in the domestic economy. There should be some confirmation that none of the corporations as proposed by Enbridge, or any of the companies involved as limited partners, will be registered outside Alberta or Canada. If any are registered in offshore locations, an identification of where this might take place is necessary to incorporate a proper understanding of potential revenue loss to provincial and federal treasuries that might arise from this tax avoidance strategy.

2.2.2. Liability Insurance

In 2010 Enbridge Equity Partners (EEP) suffered two significant oil spills—one on Line 6A in an industrial section of Romeoville, Illinois, and a much larger spill on Line 6B near Marshall, Michigan which leaked into the Kalamazoo River. These significant environmental events occurred subsequent to the submission of Enbridge's Application to the NEB.

⁶⁶ [www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/707580/B31-7_-_Attachment_JRP_IR_2.8\(b\)_-_Northern_Gateway_Ownership_-_A2C2W0?nodeid=707688&vernum=0&redirect=3](http://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/707580/B31-7_-_Attachment_JRP_IR_2.8(b)_-_Northern_Gateway_Ownership_-_A2C2W0?nodeid=707688&vernum=0&redirect=3)
JRP IR 2.8(b).

If the occurrence of these events have adjusted Enbridge's attitude toward the environmental risk of Northern Gateway, the company has not made that known. Public statements regarding the events have tended more toward suggesting how the oil spills have reduced future risk, rather than how they have underscored the recognition of greater risk with Northern Gateway.

“No accident or spill will ever be acceptable to us and we are more determined than ever to meet our goal of zero incidents...(we are going to apply) what we have learned to ensure that incidents like these never happen again.”⁶⁷

This statement in the 2010 Enbridge Annual Report seems inauthentic. The cause of the oil spill in Kalamazoo is not yet known, even after more than a year and a half since the leak took place. It would therefore be difficult to put measures in place to avoid a similar event in the future, unless Enbridge has information the US National Transportation Safety Board (NTSB), Environmental Protection Agency (EPA), and the rest of the public, including EEP's shareholders, doesn't.

The NTSB has indicated that the federal report detailing the cause of the Kalamazoo oil spill will be delayed until the Fall of 2012, more than six months after it was aimed to be released. The report is delayed because of the large number of pipeline-related incidents in the past couple of years. The investigation is important because it will detail the cause of the spill, provide recommendations and levy any fines and penalties it feels are appropriate. Once this report is filed, there should be a body of intelligence that will assist future claims mitigation and management.

If lack of determination by Enbridge to meet their zero incidents goal was the reason for not doing so, as the Annual Report suggests, it is not much comfort to concerned individuals and groups in British Columbia and Alberta who stand to lose more than resolve if Northern Gateway suffers a major leak.

There is a lot of rhetoric regarding minimizing risk and maximizing mitigation in the Enbridge documents, as well as among proponents within the industry and at senior government levels.⁶⁸ The truth about accidents is that they happen—otherwise there would not be an expensive, sophisticated and complex insurance industry, structured to blend-in the impact of these accidents across the business cycle.

As well, accidents are sometimes beyond the control of the business entity responsible for mitigating them. Pipeline corrosion and mechanical failures are the major causes of pipeline leaks both in North America and Europe,⁶⁹ but other reasons also exist. Third party error or negligence occurs, such as with the Trans-Alaska pipeline spill in 2000—a drunken man shot a hole in the pipe and 6,800 barrels were spilled before the small leak could be stopped.

⁶⁷ www.annualreports.com/HostedData/AnnualReports/PDF/EEP2010.PDF page 32.

⁶⁸ http://business.financialpost.com/2012/01/06/spill-risk-top-concern-as-northern-gateway-hearings-begin-in-b-c/?_lsa=912b0162

⁶⁹ http://www.concawe.be/DocShareNoFrame/docs/1/KCLBHNDAIOMIPDKHNHIIHFKKVEVCWY9W9YBYB3BDWYG3/CEnet/docs/DLS/Rpt_11-8-2010-00114-01-E.pdf Concawe provides ongoing analysis for European pipelines; <http://www.nytimes.com/2011/09/10/business/energy-environment/agency-struggles-to-safeguard-pipeline-system.html?pagewanted=all>

Natural disasters like earthquakes, slides, or floods also cause major problems. Flooding, for example, may “occur as a result of rainfall some distance away but transported by rivers a pipeline crosses.”⁷⁰ Deliberate acts of sabotage can also occur.

It is highly unlikely that when Enbridge does know what caused the the oil spill in Kalamazoo, that this information will guarantee a similar occurrence does not occur in the future. The company may use this knowledge to improve its claims experience—something its insurance underwriter would probably require it do—but to suggest that there will be zero incidents is unrealistic. What Kalamazoo and Romeoville have provided is catastrophic event response management experience: when another accident occurs, the company can be expected to respond more efficiently to it.

The cost of the two major oil spills suffered by EEP in 2010 are covered under the parent's (Enbridge Inc's.) corporate umbrella insurance policy for pollution liability—the same type of umbrella coverage that would be available to Northern Gateway in the event of a spill. The essential feature of this approach is that one policy covers all oil spill events such that when the total costs exceed the coverage, the partnerships become self-insured.

The coverage level in place at the time of the spills on Line 6A and Line 6B was to a maximum of \$650 million with a \$5 million deductible. Regardless of the number of spills incurred during the year, the maximum Enbridge could claim under its insurance policy was \$650 million. The company has exceeded this limit.

In October 2010, EEP estimated the cost of both Line 6A and Line 6B to be \$475 million, excluding fines and penalties and insurance protection was considered sufficient. A year later, this estimate had increased to \$773 million; \$48 million for Line 6A and \$725 million for Line 6B—the Kalamazoo spill. In the case of Line 6A, EEP is seeking recovery from third parties. With respect to Line 6B, EEP has accepted responsibility and must cover the \$75 million insurance overrun from cash flow. This affects all unit holders in the partnership and although cash disbursements to unit holders increased in 2010, EEP declared a loss.⁷¹

The EEP 10K filing to the US SEC provides an explanation of the inherent risk and limit of financial protection not yet forthcoming in the Enbridge documents presented to the JRP.

INSURANCE

Our operations are subject to many hazards inherent in the liquid petroleum and natural gas gathering, treating, processing and transportation industry. We maintain commercial liability insurance coverage that is consistent with coverage considered customary for our industry.

We can make no assurance that the insurance coverage we maintain will be available or adequate for any particular risk or loss or that we will be able to maintain adequate insurance in the future at rates we consider reasonable. Although we believe that our assets are adequately covered by insurance, a substantial uninsured loss could have a material adverse effect on our financial

⁷⁰ <http://www.cttechnical.com/pdfs/PipelineInsurance.pdf> page 4.

⁷¹ <http://ar2010.enbridgepartners.com/docs/2010-EEP-Annual-Review.pdf>

*position, results of operations and cash flows.*⁷²

Adequate financial resources become very important when reviewing oil spill exposure and the risk of environmental loss due to Northern Gateway. Given the partnership structure, what is the legal assurance that, should an environmental disaster occur that Northern Gateway has the capacity, through insurance or cash flow, to cover claims settlement? If Northern Gateway does not have the resiliency, would Canadian tax payers be saddled with the costs or does Enbridge have a legal obligation to do so. Volume 2 is silent on this issue.

Enbridge argues that Northern Gateway presents minimal risks and that a major spill is unlikely given the construction and monitoring methods of modern pipelines. As well, the company assures the public that their oil spill response plan and remedial action will mitigate sufficiently to ensure the potential costs from an oil spill remain contained.

However, based on the Kalamazoo spill Enbridge has shown a propensity to underestimate the liability and underestimate the extent and duration of the requisite clean up of a major event. In a statement before the House Transportation and Infrastructure Committee of the House of Representatives, in September 2010, Patrick Daniel, President and CEO of Enbridge stated:

I am pleased to report that the spill was quickly contained and that we had succeeded in removing most of the released oil off the Kalamazoo River within a week...By the end of September (2010) we will have completed the bulk of the clean up.

Nearly 15 months after the oil spill, in October 2011, Enbridge had to submit an updated plan to the federal Environmental Protection Agency (EPA) which was to detail how the company planned to complete the removal of submerged oil in the Kalamazoo River and remove oil and contaminated soil beyond the river bank. The EPA has stated that work will continue into the summer of 2012—more than two years after the spill took place.⁷³

Even following extensive requests for information from intervenors, Enbridge has still to identify the details surrounding its liability insurance coverage for Northern Gateway. It has yet to present a quantification of the risks. Given the fact that this is one of the key questions regarding the environmental risk Northern Gateway presents, the lack of response in any meaningful way is disconcerting. Information regarding important insurance questions is awaited.⁷⁴

One way to quantify the environmental risk from oil spills is to look at the way the private insurance industry prices it. In insurance lexicon, deciding to sell insurance protection is underwriting it, while the price charged for that protection is the premium.

72 EEP 2010 10K <http://ar2010.enbridgepartners.com/docs/2010-EEP-10-K.pdf>

73 www.epa.gov/enbridgespill

74 The latest response to the JRP IR No.9 filed January 25, 2012 does not deal effectively with these substantive issues. https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/784863/Northern_Gateway_Pipelines_LP_-_Northern_Gateway_Response_to_JRP_IR_No_9_-_A2L4S2.pdf?nodeid=784867&vernum=0

The insurance decision is a two stage decision. The insurer must decide if they are going to expose themselves to a risk by underwriting it, and if so, what premium to charge. It is a relatively simple question around which a highly complex and sophisticated industry has had to develop to make sure the answer to the question, over the long run, is correct.

Risk = Consequence x Probability

Where consequence is “how big”

Where probability is “how often”

There are a number of factors that need to be considered in calculating consequence (cost) and probability (likelihood of an event occurring). For oil pipelines these factors would include such things as pipeline characteristics (age, type), material to be transported, topography covered by the pipelines, exposure to the environment, weather conditions, landslide potential, earthquake risk, the way the pipelines are managed by the owner or operator, and size of the possible loss.

For a company such as Enbridge, whose assets extend beyond pipelines, to storage facilities, rail operations and other assets, the determination of cover and corresponding premium can be expected to be a large and somewhat complicated process. Much of this information is proprietary, but some information regarding limits of cover and general trends in premium have been discussed in published filings.

In 2010 – 2011 Enbridge held \$650 million in liability coverage. For the current insurance year, 2011 – 2012, Enbridge purchased \$575 million in liability coverage—\$75 million less than the previous year, and faced a significant increase in the premium paid for this reduced coverage.⁷⁵ Although Enbridge has expressed that it would have preferred protection greater than \$650 million, it is not clear whether the premiums were too expensive or the coverage was actually not offered by its insurer. Either way, this situation suggests that both consequence and probability—and hence risk, have increased

Steve Neyland, EEP's VP Finance explained to shareholders during the Q3 2011 meeting to review EEP's financial performance that:

The insurance market is a tough market and an expensive market, given a lot of activities that have happened out there, be it Macondo, be it San Bruno incidents. So the premium costs associated with it is more expensive, and so we (have) \$575 million coverage.⁷⁶

The Macondo incident is BP's Deepwater Horizon Oil Spill. Notwithstanding the expensive costs of this tragedy estimated at \$35 billion for BP PLC, which was largely self-insured and \$4 - \$6 billion for the insurance industry, the insurance market has responded quite readily to the increased insurance demands “and while energy insurers have been unsettled by the loss, capacity has not constricted and price increases are likely to be modest unless further major losses occur.”⁷⁷

⁷⁵ <http://www.enbridgepartners.com/WorkArea/downloadasset/13835/2010-Q4-EEP-Transcript.aspx> page 4.

⁷⁶ <http://www.enbridgepartners.com/WorkArea/downloadasset/15046/2011-Q3-EEP-Transcript.aspx> page 11.

⁷⁷ http://www.rokas.com/uploads/Environmental_Pollution_Liability_and_Insurance_Law.pdf page 37.

The San Bruno “incident” was an explosion of a gas pipeline owned by Pacific Gas & Electric that “killed 8 people and incinerated a neighborhood”.⁷⁸ The NTSB concluded after a year long investigation that the probable causes of the explosion were due to a series of internal mistakes by Pacific Gas & Electric, one of the largest gas companies in the US. “Among PG&E’s problems were a failure to learn from past accidents...poor internal communication and bad morale among company employees.” Lax regulations at the state and federal level were also seen to contribute to the accident.

PG&E had nearly \$1 billion in insurance protection when the accident occurred, but when it became known that its coverage may not be available, and hence PG&E’s financial position would be materially adversely affected, investors spooked. Shares were sold off rapidly reducing the market value of the company by almost \$1 billion.⁷⁹

The cost to remediate the San Bruno explosion has reached \$723 million, while the costs to the company in order to implement pipeline safety measures, much of what should have been ongoing in prior years to avoid the catastrophe, is estimated at an additional \$2.2 billion.⁸⁰ Its hardly a model of business efficiency when a company fails to undertake investment in safety and ends up spending as much as 50% more than they needed, not to mention the unnecessary deaths and environmental destruction.

This situation, whereby a company attempts to cut corners to save money and ultimately creates a tragic environmental event is evidence of systemic business risk. In PG&E’s case, had they undertaken proper ongoing prudent spending, its probable the explosion would have been avoided. However as a publicly traded company, attempting to generate shareholder value, the competing goal is to keep costs low. Systemic risk is discussed in more detail in the next section.

When addressing environmental risk it is often overlooked that the cost after an event occurs is to return the asset and the surrounding area back to where it was before the event. Any costs that should have been incurred to avoid the loss, and weren’t, still need to be incurred by the company, maybe even before approval for continued operation is forthcoming from regulators.

Enbridge’s reduction in insurance coverage—when the company would have preferred more—and higher insurance premiums for less coverage, raises warning signs. This situation may be as much a function of the claims experience with the Kalamazoo spill and what it tells insurers, as it is a function of the market realities of increasing pollution liability risk due to higher claims incidence in the industry.

Not everything is known about the cause of the spill on Line 6B, and all parties to the remediation have expressed surprise as to the complexities and costs involved. This was the first diluted bitumen spill that the EPA has had in an inland waterway and new methods had to be devised to clean up the oil. It is possible, once more is known, that Enbridge’s experience in

78 http://www.huffingtonpost.com/2011/08/30/san-bruno-explosion-national-transportation-safety-board-pge_n_941961.html

79 <http://articles.latimes.com/2010/sep/11/business/la-fi-pge-liability-20100911>

80 <http://online.wsj.com/article/BT-CO-20111212-716055.html>

the insurance market portends a new era of more rigorous pipeline underwriting that better reflects the risk and consequence of transporting oil sands crude.

To what extent has the Kalamazoo spill raised awareness of the need for a better understanding of the impact heavy crude oil has on pipeline integrity? The pipeline was transporting Cold Lake crude with benzene diluent. Could this have had a role to play in causing the spill?⁸¹ It certainly is having an impact on the cost of cleaning it up.⁸²

The relative risks of the type of oil that would be transported on Northern Gateway are not fully appreciated or understood. Enbridge deflects concerns that have been brought forward, while its experience with Kalamazoo suggests there are new forces at work with heavy crude.

...officials say that oil from a typical disaster of that size would have been cleaned up long ago...but this is no typical oil spill...Raw tar sands oil...spilled out of the ruptured pipeline, the benzene and other chemicals...went airborne, forcing mandatory evacuation of surrounding homes (many of which were later bought by Enbridge because their owners couldn't safely return) while the thick, heavy bitumen sank into the water. Mark Durno, one of EPA's on-scene coordinators (said) "The submerged oil is a real story—its a real eye opener...in larger spills we've dealt with before, we haven't seen nearly this footprint of submerged oil."⁸³

The Precedent Agreement filed by Enbridge contains as Appendix D a Transportation Service Agreement (TSA). Article 20 lays out the intention respecting insurance as follows:⁸⁴

Article 20

Insurance

20.1 Transporter will obtain and continuously maintain as of the Effective Date and until the end of the Term such kinds and amounts of insurance as are consistent with the operation of the Oil Pipeline in accordance with Prudent Practices and Applicable Laws.

The Agreement defines Prudent Practices in such a manner as to suggest the construction and operation of Northern Gateway possess new and additional challenges. Northern Gateway is not business as usual—it represents a significant elevation in risk.

“Prudent Practices” means for the purpose of the Transporter (Northern Gateway), those practices, methods, techniques and standards that are commonly used under similar circumstances (recognizing without limitation, the construction and operational challenges imposed by the mountainous terrain, aboriginal, marine and environmental issues), In light of the facts known or that reasonably should have been known, by the Transporter, in the pipeline business in Canada or the United states to design, construct, operate and maintain equipment

81 http://www.iosc.org/papers_posters/IOSC-2011-422-file001.pdf Enbridge’s 30-inch pipeline transported Cold Lake Crude Oil (with benzene diluent).

82 <http://michiganmessenger.com/52794/enbridge-raises-estimate-of-oil-spill-cleanup-costs>

83 <http://www.onearth.org/article/tar-sands-oil-plagues-a-michigan-community>

84 www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/692188/B26-3_-_Volume_2_-_Appendix_C_-_Pro_Forma_Precedent_Agreement_and_Pro_Forma_Transportation_Service_Agreement_-_Appendix_D page 45.

lawfully, efficiently, reliably, economically, and safely with regard to equipment of a similar size, service and type used in the Oil Pipeline;”

Enbridge currently operates 24,613 km of crude pipeline in Canada and the US. The twin system of Northern Gateway adds an additional 2,354 km and a marine terminal in Kitimat. The expansion due to Northern Gateway represents an increase of 9.6% in the company's pipeline assets covered by their blanket policy (without including the marine terminal risk). Meanwhile, in 2011 the company was unable to obtain⁸⁵ the level of coverage it believes is prudent. Its liability policy on its existing exposure was reduced by 11.5%.

Enbridge currently has a capital spending plan of \$12 billion⁸⁶ (of which Northern Gateway represents \$2.8 billion since Enbridge plans to be a half owner). The company is undertaking an increase in their exposure. Unless significant plans are in place to augment the current insurance scheme, by 2016 Enbridge may not have adequate coverage. Richard Bird, Enbridge Inc, EVP and CFO explained in October 2011:

...in terms of the magnitude of the insurance program that's an annual exercise that we would go through looking at the magnitude of the asset base that we are ensuring its exposure to both property loss and public liability exposure...we are at \$575 million of third party liability coverage at the moment which is down from \$650 we would like to get it back up to at least the \$650 level and probably a little larger. As the market is prepared to extend that kind of coverage to us.⁸⁷

The JRP needs a detailed identification of the definition of Prudent Practices and how Enbridge plans to meet those in its insurance arrangements. Its existing policy, with a reduced liability limit to \$575 million, given recent claims experience is likely insufficient.

A recommendation by the JRP to approve Enbridge's Application is an acceptance of the social and environmental risk of the project, regardless of what that risk actually is. We can safely assume that that risk is significantly greater than the risk implicit in insurance industry limits of coverage and premiums charged. We may not know quantitatively what that measure is, but the best information we have tells us that between when Enbridge prepared its Application and now, that perceived risk has gone up significantly, both within the industry and with respect to Enbridge at the corporate level. For the proponent to fail to quantify it, especially in light of more recent information regarding its oil spill experience, does not serve the public interest.

The public should not contemplate Northern Gateway with limited information regarding risk and its remediation. If the private sector insurance industry is having difficulty providing adequate levels of protection to Enbridge under current operating circumstances, what can be expected if a new pipeline is built across very demanding and challenging terrain.

85 Although Enbridge has publicly stated that the insurance market is tight due to recent claims experience, they also state that their oil spill experience is less than the industry average. Given the profit incentive that exists in underwriting, insurers would be seeking out companies with better claims/loss experience.

86 www.enbridge.com

87 http://www.enbridge.com/InvestorRelations/~/_media/www/Site%20Documents/Investor%20Relations/ENBDay2011_Toronto_Transcript.ashx page 52

2.2.3 A 10 Year Project For Proponents

One of the important points to consider with the financing and structure of the Northern Gateway pipeline project, and its relationship to risk, is that, from the perspective of investors this is a project with a payback of about 8 years. That is, based on the details of the repayment of financing arrangements provided in *Volume 2 Section 3.2 Toll Principle*, equity investors are repaid their capital at risk well within that time frame.⁸⁸

If for some reason subsequent to 2025 there are significant undesirable events—such as excess capacity on pipelines going west because of overbuilding and hence costs exceed revenues, or one or more oil spills occur along the route in a relatively short time period creating costs that exceed available insurance coverage and cash flow—and the project fails, investors may not suffer real losses if they wind down Northern Gateway. Rather they would suffer the lost opportunity to earn potential future profits.⁸⁹ After capital recovery by investors, the risk of loss due to financial failure, lessens, particularly with a limited liability partnership structure.

When exploring the relative risk faced by communities and the environment from an oil spill—as distinct from business risk faced by the entity posing the risk—a large part of the public's leverage for ensuring redress exists in the extent to which the firm causing the spill has “deep pockets” as well as their desire to avoid loss of goodwill if they do not engage in appropriate mitigation. The more the firm has to lose, the greater the likelihood expeditious and complete remediation will occur. If however, the cost of the clean up exceeds what a firm determines its going concern is worth, default may be seen as a preferred course of action.

Financial risk, to a large extent, is what disciplines corporate decision making. Financial risk is a function of many factors, important among them the extent to which real, not paper, capital is at risk. Although the proponents have indicated the pipeline project has a 30 year, or more, intended life, what the investors stand to lose begins to decline after the pipeline begins operation. It becomes significantly lessened when real loss becomes a paper loss, much of which can be transportable and written off against other income.

Investors have much more to gain from their business and much less to lose than communities and tax paying individuals, particularly after an oil spill takes place. The most recent indication of this type of inequitable burden of risks and rewards can be seen from the breakdown in the financial sector for much of the western world. When things went terribly wrong from toxic securities, the tax paying public was left with the bail out while corporate executives received their bonuses.

The only reason Canada was insulated from the worst of the financial crisis was because tough regulatory controls, which were resisted by the Canadian banking and finance sector for many years, were maintained. Discipline from effective regulation in Canada, protected the financial sector from itself, and hence proved a last line of defense for the Canadian tax paying public.

⁸⁸ Although there are numerous methods to determine the desirability of making a capital investments (IRR, discounted cash flow and NPV), payback is generally the first test. Payback does not take into account earnings beyond the payback period, and hence is not a good indication of profitability, nor does it take into account the time value of money, but from the point of view of equity at risk, it does identify when the risk of loss has gone from being real capital to future potential returns. Payback = investment/annual cash flow. Since investors are guaranteed 12%, the calculation is simply $100/12 = 8.33$ years.

⁸⁹ Any paper losses may be available to investors to write off against their other business interests.

In discussions surrounding environmental risk this important aspect of systemic business risk is often overlooked. Inherent in the business model is the fact that the rewards from the pursuit of short term profit can be so significant they can lead to irresponsible ongoing cost cutting, even if those cuts are ultimately found to threaten the business as a going concern.

On April 20, 2010, the Deepwater Horizon off-shore drilling rig caught fire and sank in the Gulf of Mexico. BP Plc., the main shareholder in the Macondo oil well issued a report and found that the chain of events that lead up to the accident could have been preventable and were a result of systemic failure.

The team did not identify any single action or inaction that caused this accident. Rather, a complex and interlinked series of mechanical failures, human judgments, engineering design, operational implementation and team interfaces came together to allow the initiation and escalation of the accident. Multiple companies, work teams and circumstances were involved over time.⁹⁰

BP is a huge corporation with deep pockets, and was largely self insured against catastrophic events, such as the Macondo incident. The company initially established a \$20 billion escrow account to cover claims and is now in the process of selling assets to meet upwards of \$35 billion in claims costs—claims costs incurred to compensate significant losses to businesses, municipalities, communities, and individuals who have suffered property damage and economic loss and face long-term uncertainty regarding the ongoing effects of the pollution.

Had the Macondo oil well been the only asset of the company with no recourse tied directly to a parent, it is quite possible that the worst environmental tragedy in US history would have been borne by the US public.

Business entities posing environmental risk always face less exposure than communities who physically live with the risk.⁹¹ Ensuring an even balance of risk is maintained is critical to the long term maintenance of corporate decision making that regulates—disciplines—itself in a manner consistent with the public interest. It is not only impossible, but impractical and undesirable for a regulatory regime to be expected to bring to bear on the ongoing operation of a pipeline and marine terminal the discipline required to keep systemic risk at bay. A business entity must know it will be held accountable for producing harm and must be able to provide evidence that it has the financial ability to do so, even for unexpected and extreme unintended events.

90 http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/incident_response/STAGING/local_assets/downloads_pdfs/Deepwater_Horizon_Accident_Investigation_Report.pdf

91 The special case of Aboriginal participation should be highlighted, however, since Aboriginal groups, who also live in potential oil spill proximity, may have a negative double hit in the event of an oil spill unless the partnership agreement explicitly protects them. That is, if an Aboriginal group borrows to finance their equity investment, and an oil spill occurs on their land, they may both have to repay the loan, and pay for a portion of the oil spill clean up from their cash proceeds.

The structure of Northern Gateway as a business entity seems to protect all parties to the project, including Enbridge, from large scale risk of onshore and marine related offshore oil spills.⁹²

The time horizon impact on financial risk to Northern Gateway should also be considered with respect to how the integrity of the design and implementation of environmental protection programs required under Onshore Pipeline Regulations of the NEB Act. are upheld the longer the pipeline operates. Rhetorical assurance that standards will be met or exceeded are not enough, particularly as financial risk for failing to do so declines.

The Enbridge Application makes clear Northern Gateway's attitude toward the trade-off that exists when environmental standards impact the bottom line. One of the main purposes of the pipeline is to protect the oil and gas industry from a continuation or enhancement of higher environmental regulatory standards in the US. The Muse Report notes:

“in the event that U.S. Federal or State energy policies or U.S. regulatory changes...impair access to some or all U.S. markets for Canadian SCO, heavy or light oil, Northern Gateway could provide somewhat of a counterbalance by adding flexibility through oil shipments to other markets.

...the existence of the Northern Gateway option would provide important leverage in achieving changes to such limiting policies or regulations to reduce the negative impacts on the Canadian oil and gas sector.⁹³

Enbridge's endorsement of this strategy hardly gives comfort regarding its publicly announced commitment to meeting and exceeding environmental regulations and standards.⁹⁴ It also underscores the need for a complete understanding of what Northern Gateway's, and Enbridge's, legal obligations are with respect to oil spill liability.

Environmental threat costs the public more than they cost business. The degree to which business entities, through their structure, and other creative techniques can minimize their exposure, the greater this gap becomes and the easier it is for vested business interests to represent concerned citizens and environmental groups as radically unreasonable. Demonizing the messenger does not remove the risk—and it may actually increase it because of the false sense of infallibility it creates.

In summary, the environmental risk Northern Gateway poses has not been internalized by the project in any meaningful way. The limited liability partnership structure proposed could actually reduce Northern Gateway's exposure as a pipeline and marine terminal project, and

92 Although Enbridge has discussed off-shore oil spills, this is not their area of responsibility. A complex system of marine liability exists and is the responsibility of tanker operators and oil producers. See:

http://www.elc.uvic.ca/press/documents/2010-02-06-Tanker-Spill-Financial-Vulnerability-Assessment_Jan15%2011.pdf

It is interesting to note that for a relatively low level of first tier mandatory coverage P&I liability insurance for tankers represents upwards of 5% of operating costs.

93 http://www.northerngateway.ca/files/application/Master_Vol%202_Final_11May10.pdf Public Interest Benefits of the Northern Gateway Project, Page 20.

94 <http://www.northerngateway.ca/environmental-responsibility/environmental-and-health-and-safety-policy/>

hence, unless explicitly accounted for in the determination of ability to pay, could expose the Canadian public to unexpected cost in the event of an oil spill.

A quantification of the social risk should be included in any discussion of the need for the project and this quantification accommodated by Northern Gateway in a meaningful and long term manner. Financial support mechanisms, such as insurance, should things go terribly wrong, must be in place to reduce such risk.

2.2.4. Proforma Financial Statements

The five year forward looking proforma financial statements for Northern Gateway provided in the Application, Volume 2 Section 4.3 are presented in a manner that is confusing and somewhat remiss in providing a clear idea of the relationship between the investors, creditors and shippers.

As well, the income and balance sheet figures provided in Section 4.3 do not correspond to the revenue, expense, assets or liability equivalents as identified in the Northern Gateway construction budget (\$5.5 billion) or toll rates assumed in the netting out of costs in the Muse Report Net Benefit Calculation of Appendix A.

There is no mention as to why the figures in the proforma statements differ materially from figures used in subsequent analysis such as the Muse Report to estimate the benefit of Northern Gateway to the oil and gas industry, and the Wright Mansell Report to estimate the benefit of Northern Gateway to the Canadian economy. For example, revenue for 2017 from Table 4-1 is projected to be \$914.5 million (presumably Canadian dollars although this is not identified) while the tolls paid by committed shippers in the Muse Report are stated to be \$440.2 million (USD). Since committed shippers form the bulk of revenue source for Northern Gateway, this gap of more than 50% of the revenue might be due to an exclusion of condensate toll rates in the Muse calculation. If that is the case, then this may point to a significant cost item overlooked in the calculation of the Muse Report Net Benefit. Clarification would be appreciated.

Gross Property Plant and Equipment could be expected to represent the cost of building Northern Gateway but the \$7,240.8 million identified in 2016 in the Proforma Balance Sheet of Table 4-2 is far in excess of the \$5.5 billion capital budget used to assess the impact of construction on the Canadian economy in Appendix B.

The financial statements state that the presentation is made in nominal dollars, and as such the estimates provided in 2009, depending upon inflation assumptions used, could result in an increase in the numbers as reflected in the statements. However, applied to Gross Property Plant and Equipment, that would require an inflation rate in excess of 4% per year. The Wright Mansell Report assumes a rate of inflation of 2%.⁹⁵

Enbridge should provide a restatement of the proforma financial statements in a form that can be directly related to financial assumptions used in other sections of Volume 2 and 6C in order that a direct and reliable link can be made from the case as presented in Proponents and Financing, to that made in 1.6 Project Need and the Public Interest. Until the reconciliation is

⁹⁵ Wright Mansell Report, Appendix B, page 25.

provided, a reasonable discussion regarding the connection of the public interest case to the financial condition of the proposed partnership, is not facilitated.

2.2.5 Structural Realities of the Partnership Could Reduce Competition

The structure and financing case presented in the Application, Volume 2 Sections 2,3,4 presents a somewhat unique and unusual relationship between equity investors in the project and shippers who use the project. Based on the information provided, it appears that a situation could develop for shippers, who are also investors, to have a reduced incentive to keep toll rates in check.

Let Company OILX be a Canadian based multinational oil producer who has a 4.9% share in Northern Gateway. The company was also a Funding Partner and hence has a right to transport its crude oil on Northern Gateway up to 1/10 of the pipeline's capacity—50,000 bbl/d at a preferred toll rate.

The opportunity cost of shipping oil on Northern Gateway is to ship it to the mid-west US using an Enbridge pipeline where it does not share in the net revenues generated from toll rates it pays.

A portion of the fees Company OILX pays for transporting its oil on Northern Gateway, which are an expense to Company OILX as a normal course of doing business and hence reduces net income, will find their way back to Company OILX in the form of dividends which are guaranteed by the partnership agreement. A minimum annual rate of return of 12% has been guaranteed, but the return could be much more. According to Proforma Statements provided these dividends in aggregate are anticipated to be approximately \$238.8 million in 2016.⁹⁶

Since dividends may be treated differently than other forms of income for tax purposes, a \$1 per barrel increase in transportation costs to OILX when it is an equity investor in Northern Gateway is very different than a \$1 per barrel increase in transportation costs would be from an arms-length pipeline (eg other Enbridge pipelines). In fact, depending upon the relative benefit of increasing expenses (in the Company OILX and hence reducing net income for the corporation) and the preferential treatment of dividends when Company OILX receives the dividend benefit from toll rates, it in fact paid, there could be an incentive for an investor in Northern Gateway to more passively accept higher, rather than pressure for lower, toll rates for the crude oil it ships on Northern Gateway than an alternative pipeline option.

This perverse market situation could arise because toll rates are treated as a business expense whereas equity returns to investors are cash disbursements that, depending upon the details of the partnership agreement, may face preferential tax treatment. To the extent a company can

⁹⁶ JRP IR2.8(c.1) Net Revenue is completely disbursed as dividends each year.

increase its expenses (thereby reducing corporate profits and corresponding taxes) and those higher toll rates find their way back to the shipper in the form of return on equity, taxed at a different marginal tax rate, an investor who is also a shipper may have a preference for cash disbursements. Hence, a more passive response to increased rates.

Obviously a detailed analysis which incorporates the relative coefficients for investors versus shippers would need to be undertaken, as well as an incorporation of the tax incidence scenarios which might exist. The inter-relationships that occur when a producer, is a shipper, is a part owner of the pipeline, is an owner of refineries, supplier of condensate coming into Canada and owner of petroleum products distribution networks, must be included in the scope of such a review in order to identify where the desirable outcome of arms length market forces might be compromised. Finally, the relationship between toll rates on alternative pipelines and those that are anticipated with Northern Gateway might provide useful to ascertain whether the starting toll rates anticipated with this agreement are in line with existing transportation costs.

The complexity of such an analysis is beyond the scope of this paper. However, the issue does require exploration because of the implications for transportation costs within Canada and its corresponding inflationary impact—that is, higher prices with no corresponding real changes in the cost of labour or capital, but purely a result of the design of a deal structure, is not only inefficient, it distorts prices and makes Canadian transportation systems appear less competitive.

More traditional business structures have a built in incentive for shippers to apply pressure to keep toll rates in check largely facilitated by an arms length relationship and no opportunity to, as directly, gain from the return on equity which arises from tolls paid. The discipline of the market works more effectively to keep prices in check. Since the proposed equity partnership structure with Northern Gateway removes an important arms length feature, the potential loss must be clearly seen. This becomes even more important since relatively higher Northern Gateway toll rates could possibly be use in the regulatory process to leverage higher toll rates on other pipeline systems by coercive comparison.

Until information to the contrary is provided, on the basis of the structural relationships as presented, it appears that there is a lack of discipline in the model which compromises market determined shipping rates. As a result it could negatively affect the determination of competitive toll rates in the North American pipeline market. To the extent that the structure, as perceived by Northern Gateway, inflates toll rates, and to the extent that toll rates are passed onto consumers, this upward pressure on prices as a result of a financing structure can not be seen to be in the public interest.

The benefits case that is presented in the Application in Volume 2 and 6C presents estimates of potential tax revenues to provincial and federal governments. No mention in the corporate structure and financing section makes reference to the mitigation of tax responsibility which might be afforded to the oil and gas industry by this sophisticated project structure, nor what that might mean to a decline in public revenue with Northern Gateway as compared to without it. The amount may be quite small relative to the overall picture, but to the extent it is anticipated by the proponents, it should be identified and accounted for as a cost to the public purse.

2.3 Impact on the Oil and Gas Industry

The impact of Northern Gateway on the oil and gas industry is provided in *Volume 2, Section 1.6 and Appendix A of the Northern Gateway Section 52 Application. Section 1.6 Economics, Commercial and Financing*. It states the “net benefit to the Canadian oil and gas industry would be \$28 billion over the first 10 years of the Project's operations alone”.⁹⁷

Northern Gateway engaged Muse Stancil to “assess the netback benefits that would accrue to Canadian oil producers (in all provinces) as a result of the Project connecting Canadian oil producers to new markets” (Appendix A).⁹⁸ The results of that analysis are summarized in Table 3 Appendix A (provided in this report as Table 1) *Summary of Northern Gateway Benefit Calculation* (Net Benefit Calculation). The \$28 billion figure has been widely used publicly by Enbridge executives and Ministers of government to point to the overwhelming benefit of the project.^{99 100}

There are two important issues to address in evaluating the reliability and usefulness of the Net Benefit Calculation provided in the Muse Report Table 3:

- i) the information included, and the information excluded, in the Net Benefit Calculation;
- ii) the sensitivity of the Net Benefit Calculation to changes in supply, crude oil prices, and the value of the Canadian dollar.

A discussion of the information that is included in the Net Benefit Calculation, and an identification of missing information which should be included, is provided in this report in Section 2.3.1, 2.3.2., and 2.3.3. A Revised Summary of Northern Gateway Benefit Calculation adjusting for missing information is provided for the first year of the project's operation in 2016 as Table 4, and for the period 2016 – 2025 as Table 5.

Section 2.3.4 includes a discussion regarding the Net Benefit Calculation's sensitivity to supply, pricing and exchange rate assumptions.

2.3.1 The Muse Report Net Benefit Calculation

The Muse Report quantifies the impact on the Canadian oil and gas industry of Northern Gateway and estimates that between 2016 and 2025, the first ten years after project start up, that:

- i) sweet synthetic crude prices would rise on average \$2.04/bbl US (real 2009) and Athabasca dilbit prices would increase on average by \$3.00/bbl US (real 2009) more than if the project were not to proceed;

97 page 1-13.

98 Ibid, page 1-13

99 <http://www.canada.com/business/Canada+great+pipeline+debate+about+begin/5932620/story.html>

100 <http://www.vancouversun.com/news/Ottawa+remarks+slow+pace+Northern+Gateway+pipeline+hearings/5923742/story.html>

ii) the Net Benefit to the oil and gas industry would be \$23.7 US (real 2009) billion over the first ten years of the project's operation.

It should be noted that Enbridge discusses industry benefits in its summary—*Section 1.6 Project Need and Public Interest*—but does not identify that some are calculated in US dollars while others are in Canadian dollars. This creates confusion, particularly since the exchange rate assumed in the report during the period 2016 – 2025 is \$1 Canadian equal to 85 cents US.

In particular, page 1-13, paragraph 4 of Volume 2 refers to “annual producer revenues increasing by \$2.39 billion in the first full year of operation and growing to over \$4.47 billion by 2025...the net benefit to the Canadian oil and gas industry would be \$28 billion over the first 10 years of the Project's operations alone.” Both the \$2.39 billion and the \$4.47 billion are US dollars, whereas the \$28 billion referred to in the same paragraph is expressed in Canadian dollars having been increased from the US figure by 1.18, the assumed exchange rate in the period 2016 – 2015.

Enbridge and other proponents publicly refer to an industry benefit of \$28 billion without reference to any exchange rate assumptions. Using today's exchange rate conditions which puts the Canadian dollar at roughly par with the US dollar, the \$28 billion figure would actually be \$23.7 billion.

It is important, throughout the JPR process that exchange rate assumptions, and exchange rate assumption implications, be clear. The US dollar is the currency used for trading oil in the international marketplace. Calculating an industry benefit is undertaken in US dollars, but translating it to the Canadian public interest, it of necessity, needs to be translated to Canadian dollars. We want to make sure that costs or benefits are not lost in translation. Unless otherwise noted, currencies will be expressed in US dollars while we explore the Net Benefit Calculation.

The Muse Report, Table 3, provides a summary of the net oil and gas industry benefit from Northern Gateway. The analysis suggests that in 2016 the Net Canadian Benefit will be \$1.5 billion and grow to an annual benefit of \$3.3 billion by 2025. The total Net Benefit is \$23.7 billion.

Table 3

**SUMMARY OF NORTHERN GATEWAY BENEFIT CALCULATION
(Real Millions of U.S. Dollars (2009\$) per Year, Unless Noted)**

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gross Canadian Producer Benefit	2,396.9	2,720.6	3,331.6	3,064.5	3,582.1	3,815.8	3,671.4	3,569.2	3,703.9	4,473.4
Less Canadian Refinery Impact	(491.5)	(547.8)	(653.5)	(563.5)	(637.1)	(673.6)	(644.5)	(565.6)	(573.9)	(642.0)
Less Northern Gateway Committed Toll	(434.0)	(440.2)	(446.6)	(453.0)	(459.6)	(466.4)	(473.3)	(480.3)	(487.4)	(494.7)
Net Canadian Benefit	1,471.4	1,732.6	2,231.5	2,047.9	2,485.4	2,675.8	2,553.7	2,523.3	2,642.7	3,336.

Source: Table 3 The Muse Report

The Net Benefit is calculated on the premise that the economic return to the Canadian oil and gas industry is a function of the level of crude oil production and the net increased price received for that production because of Northern Gateway. This is a basic total revenue calculation where total revenue = price times quantity supplied by producers ($TR = P \times Q_s$). Where the price (P) is the net price lift due to the pipeline, and the quantity supplied (Q_s) is all Canadian crude oil produced.

As well, the Muse Report presents an estimation of costs to the industry because of Northern Gateway. This is made up of the cost to Canadian refiners for higher priced Western Canadian crude oil and the committed tolls shippers face for transporting crude oil along Northern Gateway.¹⁰¹ This is a basic total cost calculation where total cost = price times quantity demanded by refiners plus tolls paid. ($TC = (P \times Q_d) + t$). Where price is the net price lift due to the pipeline (P) and the quantity demanded (Q_d) is the oil purchased by Canadian refiners, while (t) represents committed toll rates.¹⁰²

Total revenue less total cost results in the Net Canadian Benefit. $NCB = TR - TC$.

With respect to determining the change in crude prices by grade with Northern Gateway, the Muse Report uses a Crude Market Optimization Model developed internally. The pricing benefit model assumes that the Canadian crude supply volume is the same with and without Northern Gateway. No information is provided as to how the model is designed or functions. For purposes of this section of the discussion, increased prices estimated in the Muse Report are taken as given.

It should be pointed out that although Northern Gateway includes two pipelines—one to export crude and one to import condensate—the Application has been largely silent on the economic impact of the condensate pipeline on crude oil producers or on existing condensate suppliers. Presumably, if the price of condensate changes from that assumed in the Muse Report forecast, the cost to producers also changes. As well, to the extent that any importation of condensate that would have occurred in the absence of Northern Gateway, is displaced by Northern Gateway, the economic consequence should be netted off the calculation.

Since very little information is provided in the Application regarding the economics of condensate supply, it is impossible to assess how condensate shipped, via the Northern Gateway pipeline, might affect the Net Benefit Calculation. Once this information is forthcoming from Enbridge, the Net Benefit Calculation would need to be adjusted accordingly.

The Net Benefit Case is very dependent on the assumed price increase for crude oil from the start up of Northern Gateway. The Muse Report argues this will occur because:

101 Ibid., Appendix A, page 8 states that “Northern Gateway will affect the crude volume transported on the Enbridge Mainline system and consequently the Mainline system tolls. The toll impact is explicitly included in the calculation of market benefits for Northern Gateway.” Although we do not know what this impact is, presumably it comes about because crude oil supply is being withdrawn from Canadian and US markets, and being shipped to Northeast Asia.

102 The Net Benefit calculation used to create Table 3 in the Muse Report relies on the change in Canadian crude prices (by grade) by the corresponding volume of the various Canadian crude grades supplied from Western Canada found in Table A-1 and A-18 in the Muse Report. The effect of higher Western Canadian crude prices on Canadian refiners relies on data from Table A-19 and Table A-20 in the Muse Report. Committed toll rates are found in Table A-21 of the Muse Report.

- i) the Canadian crude market expands to Northeast Asia where higher delivered prices exist because of the “Asia Premium”; and
- ii) there is a northward shift in the market clearing point in North America due to a reduction in the supply of Canadian crude flowing to the North American market—Northern Gateway's intent is to restrict supply to Canadian and US purchasers.¹⁰³

In the first year of operation, Northern Gateway plans to divert 400,000 bbl/d of crude oil from the US and 40,000 bbl/d from Ontario and Quebec. This represents a 23% decline in total western Canadian supply moving away from Canadian markets, and a decline of 15% of western Canadian supply moving away from US markets to meet the needs of Northeast Asian markets¹⁰⁴

As Canadian and US refiners seek to make up their supply shortfall, all oil prices will be bid up accordingly. Based on the information provided by the Muse Report, Northern Gateway represents a continued reallocation of crude from Canadian and US markets to Northeast Asian markets over the life of the project. This supply restriction is partly why the Muse Report is able to predict a rise in crude oil prices.

If the price of crude oil does not rise as a result of the start up of Northern Gateway, the project has no Net Canadian Benefit as defined by Enbridge and substantiated in the Muse Report. This is because the analysis assumes the same Canadian crude supply volume with or without Northern Gateway. In other words, oil prices must rise for Northern Gateway to be economically feasible and benefit the Canadian oil and gas industry.

Understanding this important aspect of the analysis explains more clearly why Enbridge sees Northern Gateway not as a means to ensure adequate pipeline capacity for moving Canadian crude oil supply, but as a way to capture perceived or real pricing advantages in other markets.¹⁰⁵

Accepting for the time being the Muse Report price increase forecast because of Northern Gateway, there are two significant issues in the supply assumptions underlying the Net Benefit calculation that need to be addressed:

1. whereas the Muse Report was commissioned to “assess the netback benefits that would accrue to Canadian oil producers (in all provinces) as a result of the Project”¹⁰⁶ it applies the price benefit to only the supply of Western Canadian oil rather than all oil produced in Canada. Over the ten year period 2016 – 2025 this understates Gross Producer Benefits by \$1.5 billion US (2009\$), or 4%;

¹⁰³See page 5 of the Muse Report.

¹⁰⁴Table A-9 to A-14 of the Muse Report. In 2016 Ontario and Quebec would have received 175,900 bbl/d but with Northern Gateway they will only receive 136,000 bbl/d. In 2016 US markets would have received 2,621,700 bbl/d but with Northern Gateway they will only receive 2,231,100 bbl/d.

¹⁰⁵http://www.enbridge.com/InvestorRelations/~media/Site%20Documents/Investor%20Relations/ENBDay2011_Toronto_Transcript.ashx page 21

¹⁰⁶Volume 2 Enbridge Application 1.6 page 1-13.m

2. whereas the Muse Report states that there is a net cost to oil purchased by Canadian refiners, it only applies the higher prices to Western Canadian crude oil purchased by Canadian refiners rather than all oil purchased by Canadian refiners. Over the ten year period 2016 – 2025 this understates the Canadian Refinery Impact by \$9.3 billion US (2009\$). That is, the total cost to Canadian refineries is underestimated by 60%; and

With the adjustments to the calculation as discussed above, the Net Benefit From Northern Gateway is \$15.8 billion as compared to Enbridge's estimate of \$23.7 billion; the original estimate overstates the actual benefit by 50%.

Details of the approach followed and the steps taken to redress these errors in the Muse Report's underlying assumption are provided in Section 2.3.2 and 2.3.3 below.

2.3.2 All Canadian Production

The Muse Report provides the data used in their analysis for supply in Table A-1 which was obtained from the Canadian Association of Petroleum Producers (CAPP) 2009 Crude Oil Production Forecast, Appendix B.3¹⁰⁷. This forecast only includes Western Canadian oil producers with Atlantic Canadian producers left out of the equation.

In the CAPP 2009 Forecast Report itself, Atlantic Canada oil production forecasts are provided in Appendix B.1. These numbers can be used to upgrade the Muse Report analysis to ensure the price lift benefit is allocated across the entire Canadian oil industry.¹⁰⁸

2.3.3. All Canadian Refinery Consumption

With respect to refinery cost, the Muse Report states that “Higher crude prices...increase the feedstock cost for Canadian refiners by the same amount (to the extent the refiners are processing Western Canadian crude).¹⁰⁹ This statement (and the only time the decision to restrict the higher feedstock cost to only Western Canadian crude consumed is discussed) contradicts the general understanding among industry experts as to how crude oil prices are determined.

Canadian crude oil prices are set in the global marketplace as determined by the oil supply and demand balance.¹¹⁰ If there is a shortage, prices rise to attract supply from other markets and prices fall as a result. If there is a surplus, prices fall, and buyers will be drawn to that market bidding price back up. This explains why crude oil prices are similar throughout the world except for the cost of transporting crude and quality differences between various types of oil. Thus Canadian refiners pay the same price for crude oil as do Canada's trading partners.

Since the price of oil is determined in the global marketplace and Canadian refiners pay the

¹⁰⁷<http://www.strategywest.com/downloads/CAPP200906.pdf> Although Muse says the data was taken from the CAPP 2009 Growth Forecast, the numbers in Muse for 2009 are 86,000 bbl/d lower than the CAPP Forecast. The remaining numbers from 2010 - 2025 are the same as the CAPP Forecast. The Muse Report numbers have been used in this report.

¹⁰⁸Ibid

¹⁰⁹The Muse Report Op. Cit., page 7.

¹¹⁰<http://www.nrcan.gc.ca/energy/sources/petroleum-crude-prices/1130#crude> Natural Resources Canada.

world price of oil (adjusted for transportation costs and quality differences), and the Muse Report states that prices will rise when Northern Gateway commences operation—all Canadian refiners will ultimately pay higher oil prices. Missing the impact on all refinery purchases understates the net Canadian Refinery Impact and overstates the Net Benefit by the same amount.

The Muse Report provides a detailed forecast of Western crude oil supplied to Canadian refiners in Table A-19, but does not provide a forecast of total Canadian refinery demand over the forecast period 2016 - 2025. The Muse Report does provide a detailed table of refinery capacity in 2016 in Table A-3 which can be used as a proxy for Canadian refinery demand to upgrade the Muse Report analysis. Since no other information is provided, it is assumed that Canadian refinery capacity does not increase over the forecast period. If domestic refining capacity were to increase over the period 2016 – 2025 this would serve to increase the cost to Canadian refiners since they would buy a greater volume of crude oil at a higher price.

Table 4 utilizes CAPP 2009 Forecast for Atlantic production and Canadian refinery capacity in the Muse Report to adjust the Net Benefit calculation for 2016. The revised estimate is 44% lower than the 2016 Net Canadian Benefit calculated in the Muse Report.

Table 4

**Summary of Northern Gateway Benefit Calculation
Revised Estimate Including All Canadian
Production and Consumption
2016**

(Real Millions of US Dollars (2009\$) per year)

	Muse Report 2016 Table 3	Revised Estimate 2016	Difference
Gross Canadian Producer Benefit	2396.9	2472.4 ¹¹¹	75.5
Less Canadian Refinery Impact	-491.5	-1208.6 ¹¹²	-717.1
Less Northern Gateway Committed Toll	-434	-434	0
Net Canadian Benefit	1471.4	829.8	-641.6
Percentage change	0	-44.00%	

Source: The Muse Report Table 3 and Calculations drawn from the Muse Report and CAPP 2009 Growth Forecast Atlantic Canada Appendix 2.B

111 “Gross Canadian Producer Benefit” for the Revised Estimate 2016 is calculated using the Muse Report figure and adding the Atlantic Canada oil production from the CAPP 2009 Forecast, Appendix 2.B of 110,000 barrels per day x 365 x \$1.88 = \$74,482,000. An average price lift of \$1.88/bbl is derived from data in the Muse Report. It is a weighted average of the price per barrel by grade in Table A-18 and Table A-1 calculated as follows: Gross Aggregate Netback in 2016 of \$2,396,900,000 divided by 1,274,945,000 bbl/year (calculated as 3,493,000 barrels per day from Table A-1 x 365 days) = \$1.88054 US.

112 “Less Canadian Refinery Impact” in the Revised Estimate 2016 is calculated using the Muse Report refinery capacity from Table A-3 of 1,956,410 barrels per day and assuming a 90% capacity utilization rate. The average refinery capacity utilization rate as provided in Table 7.6b from the CAPP Statistical Handbook between 2000 and 2009, was 91.3%. The calculation is: (1,956,410 x .9) x 365 x 1.88054 = \$1,208,587,404.

The methodology used to determine the revised Net Canadian Benefit 2016, applied in Table 4 above, was used to prepare a revised Net Benefit Calculation over the period 2016 – 2025. Atlantic Canada supply from the CAPP 2009 Forecast was included, refinery throughput for all of Canada was assumed to remain constant over the period (no new refinery capacity is built or upgraded), and the price of crude is based on the weighted average price lift for each year as provided by Table A-18 and Table A-1 of the Muse Report. The revised calculation shows that the Muse Report overstates the Net Canadian Benefit by 50% over the ten year period 2016 – 2025.

Table 5
The Muse Report Summary of Northern Gateway Benefit Calculation (Table 3 Muse Report)
Revised Summary of Northern Gateway Benefit Calculation
 (Real Millions of US Dollars (2009\$) per year, Unless Noted)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Net Canadian Benefit Muse Report	1471.4	1732.6	2231.5	2047.9	2485.4	2675.8	2553.7	2523.3	2642.7	3336.7	23701
Net Canadian Benefit Revised	829.8	1044.2	1462.9	1383.5	1725.9	1865.5	1702.9	1712.5	1791.6	2252.9	15771.7
Difference	-641.6	-688.4	-768.6	-664.4	-759.5	-810.3	-850.8	-810.8	-851.1	-1083.8	-7929.3
Percentage Overstated											50.30%

2.3.4. The Net Benefit Calculation Sensitivity

For a static model, such as that used to determine the Net Benefit Calculation, sensitivity analysis can provide the reader with some understanding of the dynamic workings within the model and how the estimates may be affected by exogenous variable volatility. Sensitivity analysis can also provide insight into the relative importance of various assumptions and help identify the level of confidence the decision maker can reasonably expect to have in the conclusions of the evaluation.

The Muse Report is remiss in failing to provide a qualitative sensitivity discussion or quantitative sensitivity calculation to show how changes to variables determined outside of the model might affect the forecast benefits. Presenting an endgame figure that is extremely sensitive to dynamic market conditions, without alerting the reader to this, unnecessarily inflates expectations and heightens the probability that there will be a deep sense of betrayal if those expectations are not realized.

There are three main variables that can significantly affect the Net Benefit Calculation, including supply, prices and the Canadian/US exchange rate.

i) Supply

As discussed, the Muse Report relies on the CAPP 2009 Growth Forecast to predict the volume of western Canadian crude oil supply. The average annual growth rate in

production between 2009 – 2025 in this forecast is 4.4%.¹¹³

There is a degree of risk inherent in relying on a Net Benefit Calculation whose quantity variable relies on a supply forecast where some supply has not passed through corporate board due process and/or the regulatory review process. Such a forecast may be subjective and prone to wishful thinking, as compared to a forecast that relies on operating and in construction production capacity, all of which will have passed various hurdles of private market and public interest scrutiny.

According to the Enbridge Application, the forecast relied upon by Muse includes production growth that has not been approved by corporate boards after 2010 and production growth that has not been approved by regulatory authorities, and hence is not yet determined in the public interest, after 2022. However, the viable economics of the project relies to a degree on the successful achievement of these decision making hurdles.

Notwithstanding the serious question that remains to be addressed regarding the acceptability of a public interest case based on oil production not yet deemed in the public interest,¹¹⁴ from a business perspective, having achieved board and regulatory approval for supply volumes signals a much greater commitment to those supply volumes by the industry, than supply volumes still requiring a level of public and/or private scrutiny.

A forecast which includes a wish list of output that could become available, should market conditions remain favourable, is a very different quality of forecast than one that does not. Since part of the need for Northern Gateway is seen to rest on the industry's presentation of future supply as making a case for inadequate pipeline infrastructure, a reliable forecast becomes extremely important.

An indication of the relative role played by both types of supply—committed supply and supply still requiring an investment and/or regulatory decision—should be presented in the forecast. It is important to see the role various hurdles might play before new supply is forthcoming to better understand the reliability of the supply forecast—because forecasts are known to change.

CAPP provides an Operating and In Construction 2009 Forecast as a companion table to its Growth 2009 Forecast.¹¹⁵ In the development of its Benefit Calculation, the Muse Report could have readily projected the Benefit Calculation using the Operating and In Construction Forecast as a lower bound for projected supply, with the Growth Forecast it has used as an upper bound for projected supply.

¹¹³Table A-1 The Muse Report 2009 – $((4,240 \text{ kbbl/d} - 2,492 \text{ kbbl/d}) / 2,492 \text{ kbbl/d}) / 16 \text{ years} \times 100 = 4.4\%$

¹¹⁴Volume 2 1.6 Project Need and the Public Interest states that 3.409 kbbl/d have been approved, whereas the supply forecast upon which the Net Benefit Calculation is based exceeds this level by 2022. Any growth subsequent to this is arising from not yet approved output, therefore a question arises as to how this new production volume can be included in an estimation of the Net Canadian Benefit which is used to support Enbridge's public interest case.

¹¹⁵<http://www.strategywest.com/downloads/CAPP200906.pdf>

Over the ten year period 2016 – 2025, the CAPP Operating and In Construction 2009 Forecast, which is essentially a no growth forecast, would see a reduction in the Net Canadian Benefit of \$8.6 billion—a 36% reduction from the estimate provided by the Growth Forecast the Muse Report used (see Table 7). That is, almost 40% of the Net Canadian Benefit was premised on expectations about future output that face very different market realities than the Operating and In Construction Forecast, and hence have a much lower likelihood or probability of occurring.

For evidence of the sensitivity of forecasts to ensuing, short term market conditions, various CAPP Forecasts can be compared.

Table 6

CAPP Forecasts – Growth Case Various Years
kbb/d

Forecast	2010	2015	2020
2006	3215	4387	4718
2009	2717	3308	3939
2011	2700	3549	4466

Source: CAPP 2006, 2009 and 2011 (JRP IR 2.2(a) Growth Forecasts)

Intended supply is a function of market conditions, regulatory decisions and corporate board approvals. The outlook can change quite significantly from year to year depending upon a myriad of factors, particularly if regulatory and capital investment decisions have not been made.

It is interesting to note that in providing a 2011 CAPP Forecast in response to JRP IR No2., Enbridge submits that market conditions determining supply have little impact because “Northern Gateway is securing take or pay shipping commitments for the pipeline which will minimize the risk related to the availability of supply.”

Take or pay contracts may secure pipeline usage demand for Northern Gateway, but it does nothing to secure usage on other pipeline systems currently operating in Canada, neither does it protect the economy if shippers default on their shipping commitments. If crude oil supply falls short of the projected level, and excess pipeline capacity exists, the overall cost for all operators increases, regardless of take or pay commitments on Northern Gateway.

The viability of Northern Gateway needs to be assessed from the perspective of realistic market conditions. There may be new oil producers involved in Canadian oil sands production who desire only to export crude oil to Northeast Asian markets because of existing business relationships, and hence for the security of supply are willing to guarantee take or pay. However, to use this single market focus relationship to support a public interest case that argues market diversity, is contradictory.

The outlook for crude oil is currently very strong, but world economic conditions can change quickly and dramatically. In 2006 prospects were bright and the economic outlook for the world economy looked particularly robust. Then the financial crisis hit.

The CAPP growth forecast for supply in 2009, as the Association looked forward to 2010, was 15% lower than what forecasters anticipated in 2006 when the Association looked forward to 2010.

The CAPP Forecast for supply in 2015, before the economic downturn, was 33% higher than after (4,387 kbbl/d compared to 3,308 kbbl/d). As market conditions have returned to a less volatile state, the projections for supply become more bullish. In 2011, forecasters see a 7% increase in the level of supply in 2015 as compared with how they felt in 2009 about supply in 2015 (3,308 kbbl/d compared to 3.549 kbbl/d).

It is of interest to note that in 2007 just before the financial crisis occurred, the forecast for CAPP's Pipeline Planning Forecast case was 5,300 kbb/d by 2020—fully 19% greater than what is being put forward in the most recent forecast for 2020.¹¹⁶

Forecasts are based on best guesses about the future given what is known today. By their very creation they are prone to change. However, to provide forecasts without an identification of the underlying sensitivity to market conditions is to provide a very distorted picture of likely future events.

Certainly corporate boards of directors require alternative scenarios and sensitivity analysis when making important decisions about expanding or contracting supply. The further out the time horizon for any given forecast, the more sensitive it becomes to changes in underlying conditions.

The supply projections utilized in the Muse Report include supply awaiting some level of corporate approval by an average of 966,700 bbl/d over the time horizon under review. The annual average overstatement in production value is \$865 million per year. When compared with the Muse Report this lowers the Gross Canadian Producer Benefit from \$23.6 billion to \$15 billion, or by 36.4%.

Table 7 below provides a comparison of the supply forecast used in the Muse Report and the corresponding Operating and In Construction Forecast also developed by CAPP.

¹¹⁶<http://www.capp.ca/aboutUs/mediaCentre/NewsReleases/Pages/CAPPReleases2007CanadianCrudeOilForecastandMarketOutlook.aspx#QTncDOzJ3TVU>

Table 7

Western Canadian Oil Supply 2016-2025
CAPP Forecast Moderate Growth Compared to Operating and In Construction Forecast
(thousand barrels per day)
(millions US (2009\$))

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
1. Approved Plus Intended	3492	3600	3680	3820	3939	3975	4021	4138	4213	4240	39118
2. Operating & In Construction	3017	3004	2990	2970	2954	2938	2921	2903	2886	2868	29451
3. Difference	475	596	690	850	985	1037	1100	1235	1327	1372	9667
4. Price/Barrel \$	1.88	2.07	2.48	2.2	2.49	2.63	2.43	2.36	2.41	2.89	
5. Value \$million per day (3 x 4)	0.9	1.2	1.7	1.9	2.5	2.7	2.7	2.9	3.2	4	23.7
6. Value \$million per year (5 x 365)	-328.5	-438	-620.5	-693.5	-912.5	-985.5	-985.5	-1058.5	-1168	-1460	-8650.5

Source: The Muse Report and CAPP 2009 Operating and In Construction Forecast

The Approved Plus Intended supply in Row 1 is the forecast used by the Muse Report Table A-1.

The Operating In Construction supply in Row 2 is from the CAPP 2009 Forecast Appendix B.4.

Row 3 is the difference between the two supply projections, and hence represents the annual capacity requiring board decision making prior to production, and in 2022 and beyond includes production that has not received regulatory approval

Row 4 is the weighted average price lift calculated in using Table A-1 and Table A-18 of the Muse Report.

Row 5 represents the value in US dollars (2009) of the production awaiting some level of board or regulatory approval/day.

Row 6 represents the value of production requiring board or regulatory approval/year.

Table 7 shows that utilizing a forecast of potential future production instead of a forecast based on existing and in construction production capacity, overstates the Gross Canadian Producer Benefit by 58% over the ten year period. This restatement analysis provides an indication of the production volumes assumed in the Net Benefit calculation from the point of view of committed production, and “would like to produce if market conditions remain favourable” production. The key market condition which must remain favourable is the price of crude oil, otherwise, future investment decisions to exploit resource holdings may not be economically viable from a net present value perspective.

Another way to see this is point is that once an investment decision has been made, it is the shut down point which becomes relevant for continuing production, but prior to the investment having been committed, it is the break even point (a much higher dollar figure) that is the relevant trigger point.

ii) Prices and the Asia Premium Per Barrel Oil Price

Although the proponents present a case for Northern Gateway based on marginal price pricing—that is, the price consumers are willing to pay in Northeast Asia determines the per barrel price—marginal cost remaining below marginal price becomes significant when deciding to bring new projects on line. Presumably, the marginal cost of future oil sands development, not yet approved by boards or regulators, have greater marginal cost than the projects currently in construction and operating.

A decline in the world price of oil, regardless of WTI-Brent, or any other spreads, could significantly affect the supply plans for western Canadian crude.¹¹⁷ Although this might have a very detrimental impact on the need for pipeline capacity, and Northern Gateway could become excess transportation capacity, the public interest case for Northern Gateway does not include any consideration of this situation. The public interest case is built on the notion that the price of oil with Northern Gateway will be \$2 - \$3 dollars/bbl more than without it—regardless of how much the barrel of crude oil sells for. For the period 2016-2025, the WTI price is assumed by the Muse Report to be around \$85/bbl.

So with respect to pipeline capacity demand, in a scenario where supply falls short of the current forecast provided (because price is closer to \$60/bbl than \$85/bbl, say), given the price premium that is anticipated, the last pipeline built—Northern Gateway—would be the first pipeline used. In this case, the inflationary expose in Part 1 of this report is still relevant—prices are higher than without Northern Gateway on every barrel consumed.

The problem becomes compounded because excess pipeline capacity on pipelines going south raises the costs of transportation since toll rates adjust upward with a decline in utilization. This further price increase would be fed back into an inflationary scenario.

Clearly, if the base prices used in the forecast underlying the Muse Crude Optimization Model are over-valued, crude oil supply figures will be over-stated and the excess capacity that there is reason to believe exists even under the growth scenario¹¹⁸, would intensify. Under a falling crude oil price scenario, there will be much less crude oil trying to fill way too much pipeline capacity.

From the perspective of the public interest case, Northern Gateway would be filled first, prior to any other pipelines, because the oil it ships to Northeast Asia would command a higher price and Enbridge is securing take or pay contracts. What could be at issue here is the overall question of the public interest vis a vis excess capacity created in other pipeline or rail transportation systems and whether the public interest suffers unduly if overall Canadian pipeline throughput declines.

Whether or not the Muse Report assumptions with respect to long term oil price trends needs to be examined as they could affect intended supply. The need to question them here is without import, as they are not germane to the Net Benefit Calculation and the public interest case. Absolute prices have been assumed away by the methodology of the Muse Report analysis. This is perhaps an unreasonable assumption, given the dependency of the supply projections to sustained high oil prices. However, for now, we take the underlying pricing assumption, as provided in Tables A4-A7 of the Muse Report, as given.

Net Price Lift – Asia Premium or Importation of Inflation

With respect to the determination of netback prices, the Muse Report provides little information on the workings of their Crude Market Optimization Model, or the

117 Economics biggest threat to embattled oil sands, Martin Mittelstaedt, Globe and Mail, January 19, 2012.

118 See Dave Hughes, The Northern Gateway Pipeline, November 22, 2011, submitted as evidence to the Hearings.

sensitivity of netback pricing to changes in supply and demand assumptions. With a lack of access to information or model design it is difficult to critique the reliability of the netback calculations. Since a lift in netback prices is fundamental to the realization of any Net Benefit, it would be useful to understand how the average price lift is affected (ie., its sensitivity to) changes in the underlying assumptions of supply and demand.

However, this may not be necessary because the major argument for higher netback prices to Canadian crude oil producers seem to rely most significantly on the assumption that an Asia Premium will be realized by Canadian crude exporters. “The higher delivered cost (US\$1.60/bbl) is attributable to the “Asia Premium” charged by Mideast national oil companies for crude cargos (sic) destined for Asia”.¹¹⁹ In 2016 the weighted average increased price is assumed to be \$1.88 which means 85% of the projected gross netback benefit to Canadian producers is dependent upon the Asia Premium.

The Asia Premium is a function of, what some have called, a discriminatory pricing practice applied against Asian importers by Saudi Aramco; Saudi Arabia's oil exporter.¹²⁰ One of the major reasons this practice has survived is because Asia has not historically had access to alternative sources of supply. The Muse Report assumes “the Asia premium is expected to persist”.¹²¹ If the determination of crude oil prices in the international marketplace responds to the changing market forces of new sources of supply for Asian refiners, it is reasonable to anticipate the Asia Premium will narrow, or disappear altogether, as other countries, including Canada seek to take advantage of it.

Charging different buyers different prices not based on marginal cost is the definition of price discrimination. In order to price discriminate a number of conditions must be present: the firm must have a significant degree of market power, it must be able to identify different markets with different price elasticities of demand, and it must be able to prevent resale from lower priced markets to higher priced markets. Saudi Aramco has all these conditions present. Canada, hoping to piggyback on the higher priced regime can not ensure the continuation of the Asia Premium if Saudi Aramco decides to abandon it.

It is difficult to understand how the oil industry, publicly supported by the federal government, can use free market arguments to support the need for pipeline capacity expansion, in order to access a market where deliberate price gouging (non-free market) forces are at work. It would be one thing to argue that providing supply to Asia will remove this predatory practice, but Canadian producers actually need the Asia Premium for its business and economic case to work; particularly in the early years of the project's operation.

What might be occurring, however, is that the Asia Premium is in the last throes of its existence. For example, Sinopec Corp., China's second largest oil company is a partner in the Northern Gateway project, as well as 9% ownership in Syncrude, a 50% owner in Northern Lights Oil Sands with French partner Total S.A. and has just announced its

119 Ibid., Appendix A page 6.

120 http://www.rice.edu/energy/publications/docs/PEC_JaffeSoligo_SaudiFuture_10_2004.pdf

121 Ibid, Appendix A, page 34.

purchase of Daylight Energy for \$2.2 billion. The Daylight Energy deal “is the latest in a series of acquisitions that have seen Chinese companies acquire...energy producers in Canada as China tries to secure a lasting supply of resources to feed the world's No. 2 economy.”¹²² An extremely effective strategy to circumvent price discrimination is to begin to take control of the supply chain.

In recent years the existence of the Asia Premium has come under doubt.¹²³ An article in the Wall Street Journal by Carolyn Cui and Liam Plevin in May 2010 examined recent trends in the Asia Premium and concluded that “The rising market power of Asian oil customers is increasingly helping them to buy oil more cheaply than their counterparts in the West, a reversal of the historical pattern...the tables are turning handing an advantage to the region's fast-growing countries in the form of relatively less expensive energy.”¹²⁴

Although the rising market power may not be as significant in mitigating the Asia Premium as the quote above suggests, there is increasing evidence that adjustment factors are afoot including Saudi Aramco's reassessment of its strategy to retain dominant market control in Europe and the US. As well increased supply from markets such as West Africa and Russia are impacting Saudi Aramco's dominant market position. The Muse Report even argues that “refiners in (China and Japan) are very interested in diversifying their supply sources so as to reduce their heavy reliance upon Middle East crude supply.”¹²⁵

In December 2009 Russia completed construction on the Eastern Siberia Pacific Ocean (ESPO) pipeline to allow export of up to 300,000 bbl/d from Kozmino to Asian markets—threatening market share and premium prices charged by Saudi Aramco. Russian pipeline expansion plans include additional supply including a second pipeline by 2014 which could see potential total supply from Russia of 1.6 million bbl/d. “Russian crude will cut the premium and shake up the sellers in Asian market, says Chang Jihak, the senior vice president for crude oil and trading at Hyundai Oil Bank, South Korea's fourth largest refiner”¹²⁶

From 2007 to 2009 the Asia Premium experienced periods of significant discount such that the “OSP differential between Asia and US for Arab Light (AL) ranges from a negative \$20/bbl to over \$30/bbl over 2007-2009. In 2007, we estimate that Asia paid on average \$2.00/bbl less for its FOB purchases of AL crude, while it paid about \$4.70/bbl more in 2008 (when the differential spikes starting in March 2008) and \$1.90/bbl less in 2009.”¹²⁷ This suggests the Asia Premium on average was \$0.80 over the three year period 2007-2009.

122<http://www.canadianbusiness.com/article/49727--sinopec-international-to-buy-daylight-energy-in-deal-valued-at-2-2-billion-canadian> October 9, 2011.

123http://www.eria.org/pdf/research/y2010/no25/6_Ch6_The_Asia_Premium_formated_Ayu_30Nov11.pdf

124<http://www.livemint.com/2010/05/30204728/Economic-clout-earns-Asia-an-o.html?atype=tp> May 31, 2010

125Muse Report Op. cit., page 12.

126<http://www.thenational.ae/business/energy/russia-threatens-asian-premium>

127ERIA, op cit., pages 172-173.

Some observers believe the Asia Premium may actually be a North American and European discount as Saudi Arabia has attempted to maintain its market share in the western world at the expense of price. Should the Saudi marketing strategy change, we would see the price differential narrow.

As well, there is a significant push in China to move away from oil import price controls that have allowed industry and consumers to insulate themselves somewhat from the affects of higher oil prices. Chinese authorities are also becoming increasingly concerned over inflation and the nation's ability to maintain its rapid growth in the face of declining world demand for its exports. As domestic crude oil prices charged refiners increasingly reflect international market prices, it is going to affect Chinese crude oil demand, growth and hence, the ability of the Asia Premium to be retained.

There have been numerous joint venture projects between nationally owned oil companies, among them agreements between Saudi Aramco and Sinopec. In 2007 ExxonMobil, Saudi Aramco and Sinopec established a joint venture to create Sinopec SenMei Petroleum Company, a refined products sales company and largest oil products supplier in the Fujian province. In 1985, SOA (Saudi Aramco Overseas; 100% owned by Saudi Aramco) invested in Showa Shell, one of the largest refiners in Japan with a combined capacity of 515 kbb/d with Saudi Aramco supplying Arabian crude. As well, SOA owns 35% of S-Oil, a south Korean oil refining and marketing company which operates a 580 kbb/d refining complex and marketing network with over 1,600 retail service stations.

A deal between Saudi Aramco and Sinopec to build a refinery in Yanbu was signed January 9, 2012.¹²⁸ As well, China National Petroleum Corp and Saudi Aramco plan to build a 200 kbb/d refinery in southern China's Yunnan province. Saudi Aramco also has plans to expand into Vietnam and Indonesia.¹²⁹

In fact Saudi Aramco and Sinopec are traveling the globe looking for projects to enhance their positions along all points in the supply chain and co-venture when mutual benefits exist. Saudi Aramco, Sinopec and CNOOC (China's largest producer of offshore crude oil and natural gas and one of the largest independent oil and gas exploration and production companies in the world) are each in talks to buy a 30% stake in Texas-based Frac Tech Holdings LLC which provides and operates pressure-pumping equipment for the US oil and gas industry.¹³⁰

To base the Net Benefit calculation on the continuation of a pricing premium that faces numerous pressures and forces that could possibly see its demise is both unrealistic and irresponsible. Estimates place the annual cost of the Asia Premium to Asian economies at \$4 billion - \$8 billion per year; it can be expected that a strategy is in play to remove that burden, particularly as Northeast Asia feels the pressure of slower world growth and rising world prices.

¹²⁸http://www.menafn.com/qn_news_story_s.asp?storyid=1093470812

¹²⁹<http://www.bloomberg.com/news/2011-04-08/saudi-aramco-to-expand-into-vietnam-indonesia-after-china.html>

¹³⁰<http://online.wsj.com/article/SB10001424052970203893404577099330997219946.html>

It is highly unlikely that, as Asian national and multinational companies secure their supply by direct investment overseas, that the Asia Premium will be tolerated in Canadian crude supply sale negotiations. Canada does not have the market power, or the distinct markets. If anything, the way the analysis in the Muse Report is presented, Canadian oil consumers, by being forced from a North American demand curve to a less elastic Northeast Asian demand curve, are being set up to be the consumers that bear a premium—after all the Northern Gateway case is premised on the price of oil increasing for all Canadian refiners.

The main point to glean from the foregoing discussion is that if Northern Gateway captures a price increase because it successfully piggybacks on the Asia Premium, this will create inflation and concomitant negative pressures on the Canadian economy. If it doesn't capture the Asia Premium, there is no net benefit to the oil and gas industry, and there is no economic case for Northern Gateway.

In summary, it is very unlikely that the premium pricing Enbridge says the oil industry is capable of accessing is sustainable or achievable given the developments occurring in the supply and demand for crude oil on world markets. Capturing this “brass ring” is even more unlikely when the investors and their relative interests are considered—it is hardly likely that Sinopec or COONC (through its relationship with MEG) are going to gouge themselves.

iii) Exchange Rate Sensitivity

The Muse Report makes no clear mention of the exchange rate assumptions implicit in the analysis and how sensitive the Net Benefits Calculation might be to exchange rate changes. The analysis has been undertaken in US dollars and exchange rates are only accessible by calculating how the report translates the \$23.7 billion in Net Canadian Benefit to CA\$28 billion. It appears that the exchange rate is assumed to remain constant over the 2016 – 2025 period at the rate of \$1US for 85 cents Canadian.

This would be consistent with the exchange rate assumptions as outlined in the Wright Mansell Report where amounts denominated in U.S. dollars are converted to Canadian dollars at an exchange rate of \$1Cdn = \$0.91US for 2010, falling by \$0.01 per year until 2015 and then remaining at \$1Cdn = \$0.85US in all subsequent years.

It would be helpful to know what exchange rate assumptions are assumed in the linear programming model the Muse Report employed to calculate its prices since supply of Canadian crude, in any given year, could be affected by exchange rate changes. However, it is not critical to understanding the implications of exchange rate assumptions during the 2016 – 2025 period of the Net Benefit calculation and that calculation's sensitivity to an appreciation of the Canadian dollar.

Although the Net Benefit estimate is, quite correctly calculated in US dollars, in terms of discussing a Canadian public interest benefit, the Net Benefit, of necessity has to be discussed in terms of Canadian dollars. Translation of the Net Benefit from US to Canadian value is, however, when confusion and misrepresentation can easily occur. Great care must be taken in understanding how exchange rate volatility affects oil and

gas industry profitability. If exchange rate implications of the Net Benefit are not understood, the public interest case can be significantly misleading.

Notwithstanding the complex, and myriad hedging practices corporate treasuries engage in, and the fact that the Canadian oil industry is primarily comprised of multinational corporations with opportunities to mitigate exchange rate fluctuations, some, if not the majority of the benefits to producers can evaporate with upward pressure on the Canadian dollar; particularly the smaller and more domestically based those oil producers are.

This impact can be readily shown with by the following simple example.

1. The price of sweet synthetic crude is \$98US/bbl;
2. The exchange rate is \$1US = \$1.18 Canadian, or \$1CDN = \$.85US;
3. Producers receive the equivalent of \$115.64 for every barrel they sell;
4. Northern Gateway becomes operational and the price of sweet synthetic crude rises by roughly \$2.00US, as predicted;
5. A vibrant natural resource sector, stimulated in part by the higher netback prices due to Northern Gateway, begins to put upward pressure on the Canadian dollar;
6. The Canadian dollar rises by 2 cents and now the Canadian dollar is worth 87 cents US or \$1 US = \$1.15 Canadian;
7. The producer benefit from Northern Gateway is eroded by the appreciation of the Canadian dollar because a barrel of sweet synthetic, which now sells for \$100 US is only worth \$115 Canadian. In fact, on a Canadian dollar equivalent basis, the producer is receiving less money per barrel than before Northern Gateway (in this example, 64 cents a barrel less).

This example illustrates the significant degree of sensitivity the Gross Producer Benefit in the Net Benefit Calculation faces from a change in the value of the Canadian dollar. In this example, the Canadian dollar appreciated by 2.35% and the Gross Producer Benefit was eroded. Obviously, the example could work in the opposite way with a depreciation in the value of the Canadian dollar. However, given exchange rate realities and the relative importance natural resource exports play in determining the strength of the Canadian dollar, the likely movement is toward an appreciation, not a depreciation of the Canadian dollar; particularly when the analysis starts with an 85 cent Canadian dollar in 2016.

Cenovus Energy, one of the Funding Partners in Northern Gateway, identifies that one of the four key performance drivers for their financial results is the US/Canadian dollar exchange rate. *“During the first quarter of 2011, the Canadian dollar strengthened relative to the U.S. dollar, primarily driven by the increase in crude oil prices. An increase in the value of the Canadian dollar...has a negative impact on our revenues as the sale prices of our crude oil...(is) determined by U.S. benchmarks.”*¹³¹

In order to fully appreciate the impact on the entire Net Benefit calculation of various exchange rate scenarios, a detailed, and more sophisticated analysis would be required.

¹³¹Cenovus, Op. cit., page 5.

This would need to incorporate the relative gains and losses that would be experienced by both producers and refiners when the exchange rate changes. That is, an appreciating dollar has a negative impact on producers, while an appreciating dollar has a positive impact on Canadian refiners who buy their oil at a relatively lower Canadian dollar cost once the value of the Canadian dollar rises.

Given the relationship between the value of the Canadian dollar and resource prices, and the other assumptions in the model regarding US and international demand for crude oil, the assumption that the Canadian dollar will depreciate to 85 cents US by 2016 and remain unchanged over the ten year period is highly suspect and not realistic.

Because Canada is a net exporter of oil, imports roughly 50% of refinery needs, and oil transactions are conducted in US dollars, the Net Benefit Calculation will be affected by any change, as well as the rate and duration of any change, in the exchange rate.

The relative magnitude of this change is complex and is related to the standards and practice of corporate hedging operations and well as transnational business structure of the companies affected. For example, Nexen produces crude oil in Canada, but refines it in the US thus protecting itself somewhat from exchange rate sensitivity. However, even with the natural hedge cross border vertical integration affords, the company still maintains that Canadian dollar appreciation affects its business.¹³²

To present the oil and gas industry financial performance as immune to this pressure, and to take the Net Benefit Calculation as given while the underlying assumption is that a devalued and unchanging Canadian dollar will persist, is gravely misleading. This misrepresentation of the economic environment is even more obvious when one considers that the supply projections used in the analysis portends unprecedented natural resource export growth which, if anything, is likely to put upward, not downward pressure on the Canadian dollar.

Therefore, depending upon the exchange rate scenario assumed, and the adjustments as have been identified as necessary to the Net Benefit Calculation, it is possible, and in fact likely, that the Northern Gateway project is not in the interest of the oil and gas industry in Canada.

2.4. Impact on the Canadian Economy

The Canadian public interest case is developed in *Volume 2 Economics, Commercial and Financing, Appendix B, the Wright Mansell Report* by taking a Net Canadian Benefit calculated in a manner similar to that detailed in the Muse Report and using this Net Canadian Benefit as the input into an Input-Output (IO) model to estimate the contribution the project will have on GDP, labour income, employment and government revenue. The report evaluates “the benefits of the Northern Gateway project in terms of need and the Canadian public interest.”¹³³ A summary of the Wright Mansell and

¹³²www.nexeninc.com/Investors/~/media/2010/Nexen_2010_MDA.ashx page 111. A 1 cent appreciation of the Canadian dollar, according to the 2010 Annual Report, would reduce net income by \$15 million. Page 112

¹³³Wright Mansell, page 4.

Muse benefits is provided in *Section 1.6 Project Need and the Public Interest* represented in Table 8 below.

Table 8

Estimated Economic Benefits of the Project Revisited

Gross domestic product (GDP) for first 30 years	\$270 billion
Additional labour income for first 30 years	\$48 billion
Employment (person years) for first 30 years	558000
Government revenue (federal and provincial) for first 30 years	\$81 billion
Oil Industry Net Incremental Revenue for first 10 years	\$28 billion

Source: Enbridge Application page 1-14 Table 1-5. All \$s in Canadian

The benefits listed in the first four rows were calculated by Wright Mansell. The benefit listed in the final row was calculated by Muse Stancil and is the Canadian dollar equivalent, assuming an 85 cent Canadian dollar of the Net Canadian Benefit calculated in the that report as presented in Appendix A to Volume 2 of the Enbridge Application.

Section 2.3 of this report addressed the errors inherent in the \$28 billion and suggests that adjusting for the methodological and calculation errors, the figure would more appropriately be \$15.8 billion. Recognizing the sensitivity of this revised estimate to relatively small changes in important underlying assumptions regarding oil prices, future crude oil production and exchange rates, this figure could readily be zero or negative.

A zero Net Benefit to the oil and gas industry would occur if the projected crude oil prices calculated in the Muse Crude Oil Optimization Model prove to be eroded from an inability of Canadian crude oil exports to participate in the Asia Premium, and if the market clearing for WTI does not shift northward.

To the extent Northern Gateway toll rates are subject to inflationary pressures arising from the structure of the deal vis a vis shippers who are also equity investors in the project, the benefit of a price lift could be further eroded. This situation respecting toll rates would tend to put upward pressure on all toll rates in North America.

The Muse Report has stated that an increase in toll rates for other pipeline systems is anticipated because Northern Gateway will shift throughput demand. It has also stated that the increased toll rates on other systems, including Mainline (for crude oil and condensate) have been included in the calculation of the gain to producers. It is preferable that the increased toll rate cost for other systems, assumed by the Muse Report, be identified on an annual basis as a separate line item. Otherwise it is extremely difficult to see its real impact on the Canadian economy, particularly if the price lift does not materialize, since the higher transportation costs will still exist.

Understanding the vulnerability of the Net Benefit calculation in the Muse Report is extremely important when analyzing the Wright Mansell Report, since the Wright Mansell Report develops its estimate of the Net Benefit along similar methodological lines. It would be expected that the analysis

undertaken by Wright Mansell, using the same price lift and same supply forecast would arrive at very similar, if not identical conclusion as the Muse Report. This is not the case. The Wright Mansell Report, for the period 2016 - 2025 arrives at an Oil Industry Net Incremental Value of \$32 billion—14% greater than Muse's \$28 billion. It is this larger annual Net Benefit that Wright Mansell uses to predict economic benefits to 2045 and eventually arrives at a figure of \$264.1 billion as the Net Benefit, whereas the Muse Report suggests \$28 billion. The reason for this discrepancy is detailed in section 2.4.1 below.

What this section of the report shows is that there are errors in the input figures used by Wright Mansell and a misapplication of IO analysis to derive an impact from the operation of Northern Gateway. To get at the implications of these errors requires a disaggregation of the input figures, as well as a disaggregation of the components of the IO model used.

What we will find is that the only component of the project that might effectively be explored using an IO framework is the construction component. We will also find, not only is the Net Benefit calculation for the oil and gas industry inflated and at risk from dynamic economic activity, but that the operation of the project is based largely on double counted benefits. Northern Gateway represents a redirection of crude oil that would have been shipped to Canadian and US markets anyway, and therefore its revenues (seen as a positive shock for an IO model) represent costs to other systems. This reality needs to be accounted for in the calculation of the project's operating impact.

Obviously, if the input is unusable, the output, by definition is unusable. This is why, among the economics profession, to flag this pitfall, IO models are sometimes referred to as “garbage in-garbage out”. That is, the analysis can be polluted by irresponsible operation of the model, rendering any reliance on the results as unusable. It becomes the responsibility of the IO model user (since the design and upkeep of these models by statistical agencies is rigorously maintained) to uphold the integrity of the analysis.

The discussion that follows does not duplicate the questioning undertaken when reviewing the Muse Report Net Benefit calculation. All the estimate errors and omissions that Muse committed, Wright Mansell has also committed. This discussion identifies new and important issues regarding the pricing benefit.

This section of the report also addresses the development of the benefit estimates from the construction and operation of the pipeline—the validity of the other 9% of GDP, person years of employment, labour income and government revenues still not directly addressed in this report.

By way of review, Wright Mansell uses an IO model to predict future impacts on the Canadian economy. IO models “stimulate the effect on the economy when overall output of an industry changes in a specific region or when final demand for a particular commodity changes in a specific region (these changes are referred to as shocks).¹³⁴ The impact (eg., \$270 billion increase in GDP over 30 years) is the sum of the estimates of the economic impacts associated with:

- i) the construction of the pipelines and related facilities (where the shock to the model Wright Mansell uses is the \$5.5CDN billion capital cost);

¹³⁴Northern Gateway Response to Province of BC IR No.2 page 2.

- ii) the operation of the pipelines (where the shock to the model is revenue earned);
- iii) the crude oil price uplift (where the shock to the model is the Muse Report Benefit Calculation where the toll rates have not been included as a cost and Wright Mansell have inappropriately mixed US\$ with Canadian\$'s and hence their input numbers are miscalculated¹³⁵); and
- iv) re-investment of the producer benefits from the price lift.¹³⁶

Table 6 below shows a breakdown of the impact on GDP with respect to the Wright Mansell estimate of an increase in GDP of \$270 billion over the 30 year period and the relative importance of each of the four components to the total figure.

Table 9

Disaggregation of GDP Impact Estimate \$270 billion Over 30 Years
(billions CDN\$ real 2009)

Construction	4	2%
Operation	20	7%
Price Lift	108	40%
Reinvestment Price Lift	<u>139</u>	<u>51%</u>
Total GDP Impact	<u>270¹³⁷</u>	<u>100%</u>

As was addressed in Part 1 of this report, the majority of the impact is felt from the price increase of oil and its reinvestment into the Canadian economy. This is only half the picture, as the feedback of consumer and business behaviour as a result of higher prices was assumed not to occur. Hence the inappropriateness of IO model to explain the impact. Employing a more appropriate general equilibrium framework reveals that the impact on the economy, without a drop of oil being spilled, is likely negative.

2.4.1 The Wright Mansell Net Benefit Calculation

The data used in the Wright Mansell Report is explained in the Wright Mansell Report Section 2.6 as Appendix B in the Northern Gateway Application and the Northern Gateway Response to Federal Government IR No.1.13.¹³⁸ A section of the table is re-created below for 2016 and 2025, along with the corresponding information from the Muse Report Table 3 to illustrate the similarities and differences between the two reports. Column 8 identifies the greater figure used by Wright Mansell as input into their model, illustrating an unaccounted for increase in the Net

¹³⁵This error will be discussed in detail when the input figures are examined.

¹³⁶Detailed tables relating to these inputs have been provided in IR 1.13 filed October 6, 2011 https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/725347/B41-6_-_Attachment_Federal_Government_IR_13_-_A2E8J2.pdf?nodeid=725442&vernum=0

¹³⁷Errors due to rounding adjusted to correspond to Enbridge \$270 billion.

¹³⁸https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/725347/B41-6_-_Attachment_Federal_Government_IR_13_-_A2E8J2.pdf?nodeid=725442&vernum=0 provides the detailed tables upon which this discussion is based.

Canadian Benefit. The summation of these higher figures for the period 2016 – 2025 results in a Wright Mansell number of \$33.3 billionCDN, whereas the Canadian equivalent for the Muse Report is \$28 billionCDN. There is no explanation for this difference.

Table 10

**Expected Net Revenue Benefits from Price Uplifts
Muse Versus Wright Mansell
Selected Years**

Year	1 Gross Benefits C\$million	2 Cost to Refineries US\$million	3 Net Benefits C\$million	4 Northern Gateway Committed Toll US\$millions	5 Net Canadian Benefit US\$millio n	6 Net Canadian Benefit C\$million	7 Gateway Sales C\$million	8 Net Canadian Benefit Into IO Model
2016 Wright Mansell Report	2399	492	1821	0	1543	1821	424	2245
2016 Muse Report	2397\$US	492	1905\$US	434\$US	1471	1736	0	1736
2025 Wright Mansell Report	4613	642	3858	0	3279	3858	650	4508
2025 Muse Report	4473\$US	642	3831\$US	495	3336	3936	0	3936

Column 6 above corresponds to the Net Canadian Benefit as determined by the Muse Report and as recreated by the Wright Mansell data. If Wright Mansell had used the information it calculated as similar to the Muse Report Net Benefit, then in 2016 Wright Mansell would have only been 5% greater than the estimate calculated by Muse for 2016; a relatively small difference.¹³⁹

It appears that the Wright Mansell Report did not identify the Committed Toll Rates as a net cost directly, but somehow incorporated them in the Gross Benefits C\$million figure used in its analysis. The Wright Mansell Report makes no mention of Toll Rates as a cost nor is it discussed in Enbridge's follow up information in response to information requests. An exploration of these estimates as provided in the table above, suggest that they are somehow accounted for in the first stage of calculation, but then netted back out in subsequent steps.

The treatment of toll rates for Northern Gateway and Enbridge's Mainline should be explicit, especially since they are assumed to increase when supply is redirected to Northern Gateway.

¹³⁹ 2016 the Net Canadian Benefit assumed in the Muse Report Table 3 is \$1,736 million, while the Wright Mansell Report uses \$1,821 an increase by Wright Mansell of 5%. In 2025, the Wright Mansell result is lower than that of Muse (\$3,858 million versus \$3,936 million) or 2% lower.

An examination of Table 2.4 in the Wright Mansell Report and Table IR 1.13 identifies that Wright Mansell took the data determination another step than that done in the Muse Report. They have calculated an additional Canadian dollar benefit called “Gateway Sales” which in 2016 is \$424 million rising to \$650 by 2025. Although no explanation of this benefit is given, based on a 525,000 bbl/d throughput and an average lift \$1.88\$US per barrel, it appears that Wright Mansell adds in a benefit for Northern Gateway in terms of an additional price lift for all oil flowing along the pipeline.

The Muse Report has already included this benefit in its initial calculation of its Net Canadian Benefit when it multiplied all Western crude production by the price lift (\$1.88 on average in the first year of operation – 2016). The fact that Wright Mansell adds it in again suggests double counting of the benefit from Northern Gateway. This increases the Wright Mansell Net Benefit in 2016 by 29% more than that calculated by the Muse Report. By 2025 the double counting error has fallen to a 15% over-estimate (partly because the size of the numbers are growing, hence errors are smaller on a percentage basis) and about 15% level of error continues in the analysis for the ensuing 20 years.

By way of comparison, the Muse Report sums the Net Canadian Benefit in Table 3 of its Report and, using an 85 cent Canadian dollar arrives at an estimate of \$28 billion CDN over ten years. Taking the similar Net Benefit Calculation in the Wright Mansell Report Table 2.4, the summation from 2016 – 2025 is \$33 billion—a 14% difference. Wright Mansell then extends this inflated Net Benefit, from a Muse Report already inflated figure as identified in Section 2.3., adds another 20 years of benefits at \$3.7 billion a year to arrive at \$107.6 billion.¹⁴⁰ It then estimates a reinvestment rate and arrives at an additional \$44 billion from this source which gives rise an additional \$112.5 billion because the reinvestment is said to create new production.¹⁴¹ Thus, Wright Mansell arrives at a figure of \$264.1 billion related to the value of the price increase to shock the IO model.

Table 11

**Disaggregation of the Wright Mansell Net Benefit
Used as Input into the IO Model
2016 - 2046**

	CDNS\$ Billion	
Capital Investment	5.5	Capital budget
Operating Revenue	20.2	Revenue stream from operation
Price Benefit	107.6	Similar to Muse \$28 billion +20 years
Reinvestment Price Benefit	44	40% reinvestment rate assumed
Production from Reinvestment	112.5	Expansion of output attributable to reinvestment
Total Shock to IO Model	289.8	Of which \$264.1 due to price lift

Source Wright Mansell Report and Response to Federal Government IR No.1.3

¹⁴⁰www.neb-one.gc.ca/11-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/725347/B41-6_-_Attachment_Federal_Government_IR_13_-_A2E8J2.pdf?nodeid=725442&vernum=0 The sum of the column called Summary of Price Uplift Revenue Benefits for WCSB Crude Oil Production and Sales Total C\$million.

¹⁴¹Wright Mansell page 36.

The way the information is presented in the summary and during the general discussion is that the Net Canadian Benefit is \$28 billion—but this is not the Net Canadian Benefit used in the analysis. Utilizing a similar methodology, exaggerating the benefit and expanding the time horizon of the analysis with no underlying discussion of why everything would remain the same from 2026 – 2046, the Wright Mansell Report creates a Net Canadian Benefit of \$107.6 billion, assumes 40% of this figure would be reinvested into the Canadian economy, and generates a multiplier of 2.55 times and creates a further \$112.5 billion shock to arrive at a grand total of \$264.1 billion.

Therefore, it should not be assumed that the net oil industry benefit of \$28 billion was used as an input into the IO model to arrive at the GDP, employment, labour income or government revenue estimates as provided in the Wright Mansell Report—rather it was a larger estimate of \$264.1 billion developed by Wright Mansell.

Although an adjustment to the input numbers to remove the double counting and re-estimation of the IO analysis would be required to see how significantly the double counting affects the projections in the Wright Mansell Report, it is likely to be so significant as to disregard the results of the analysis. As well, a revision incorporating all crude oil produced and all crude oil consumed by Canadian refineries would also need to be undertaken. This is before taking into account supply, price and exchange rate sensitivity impacts on the estimate, or the impact of higher prices on the Canadian economy which would still be as significant as identified in Part 1 of this report.

Finally, it should be mentioned that neither the Muse Report or the Wright Mansell Report incorporate a discussion of the economic realities of condensate import and how the cost of imports affect the pricing lift and/or the Net Canadian Benefits. To the extent that imports are leakages in the economy, and to the extent that increasing imports of condensate are anticipated, this is a very important aspect of the discussion that has been completely overlooked. At the very least, the displacement of condensate supply from other markets in the early years of Northern Gateway, particularly if they displace Canadian supply, as well as the net impact of increased imports and their sensitivity to prices should be developed and included in the Net Canadian Benefit estimate. Without incorporating the condensate portion of the equation, the analysis may be providing another source for over exaggerating the positive picture.

Throughout the examination of the Net Benefit calculation provided by both Muse and Wright Mansell, this report has attempted to identify usable conclusions. However, there do not appear to be reliable or useable results. Even the impact on the oil and gas industry has been misrepresented—the industry may be facing much less benefit than anticipated, even when the impact on Canadian consumers is ignored. This continued misrepresentation of the impact on the industry is extremely dangerous because of the long range implications of Northern Gateway.

There is no question that select participants within the industry will gain significantly from Northern Gateway. For producers, who are also shippers, the gains are huge—whether or not the price of oil goes up. To assist—indeed pay for—the realization of the energy strategies of multinational oil companies, and oil companies owned by foreign nationals, is not in the public interest of Canada.

No matter how you look at the Northern Gateway case as presented by Enbridge, Canadians end up paying—paying directly through a transfer of income and exposure to inflation because we become subject to a Northeast Asian determined demand curve for oil—paying in lost opportunities to expand our industrial base and develop a measured pace of non-renewable resource extraction—paying psychologically and morally because of the environmental risk the threat of onshore and offshore oil spills represent—and to the degree they happen—paying financially to return ourselves to a pre-spill state.

2.4.2 Construction Impact of Northern Gateway

There remain two other aspect of the analysis to be explored. The construction and operational aspects of the pipeline.

The IO model used to create the estimates of economic impact from the price increase and its reinvestment also included the construction and operation of the pipeline project. All benefits were aggregated to create the summary of benefits.

It is not clear from the information if Wright Mansell undertook one modeling which aggregated the capital, operating, net revenue gain, and reinvestment of that gain, or undertook a separate modeling of each of the construction, operation, price lift benefit and reinvestment of benefits.

If an aggregated approach was used to determine the input into the IO tables, this would raise serious questions regarding the reliability of a disaggregation of numbers to present a picture of the impacts from construction, and the price lift. As well, there would be additional questions regarding double counting of impacts. Clarity on the issue regarding aggregate or separate models, and which IO tables were used, needs to be provided.

A disaggregation of the construction and operation of the IO model results are not presented in the Wright Mansell Report, however, the Province of BC requested this disaggregation in its IR No. 2. The response provided by Northern Gateway is provided below.¹⁴²

Table 12

PIPELINE CONSTRUCTION IMPACTS (\$million Canadian-2009)	BC	Alberta	Ontario	Quebec	Sask	Other	Canada
Investment	3,962	1,579					5,541
Labour Income	1,376	846	200	65	27	29	2,543
GDP	2,160	1,284	315	103	61	51	3,974
Employment (person years)	15,589	9,282	3,026	1,139	468	546	30,049
Federal Government Revenue	379	218	55	13	7	7	680
Provincial Government Revenue	199	88	34	18	5	4	348
Total Government Revenue	578	305	89	31	12	12	1,028

This analysis suggests that the benefit to the Canadian economy from the capital expenditure of \$5.5 billion would be an increase of \$4 billion to GDP and an increase of 30,049 person years of employment as direct and indirect impacts are felt. As well, the analysis suggests an increase in

¹⁴²https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/764513/B47-28_-_Response_to_Province_of_BC_IR_No._2_-_A2I9K6?nodeid=764749&vernum=0

government revenue of \$1 billion arising from construction of the project.

IO analysis assumes the expenditure of \$5.5 billion is injected into the economy in one shot. The model is based on 2005 Statistics Canada Input Output tables, with results then increased by an inflationary factor to enable them to be reported as 2009 real figures.

An interesting aspect of IO analysis, when presented as an activity in isolation such as that provided in the table above, is that it assumes that if Northern Gateway does not take place, the investment will disappear—Northern Gateway or nothing. But this does not reflect reality. The Wright Mansell Report assumes a 40% reinvestment rate of oil producer revenues from 2016 – 2046, so in taking their lead, the investment in Northern Gateway should be adjusted accordingly.

Therefore, at the outset, the capital investment figure should start at something much less than \$5.5 billion. In this way, we avoid double counting the impact of the construction project as compared to a no Northern Gateway scenario. We need to keep in mind that analysis that sheds light on the situation needs to keep as its focus a net impact—not a gross one.

Northern Gateway's response to BC IR No.2¹⁴³ explains that the Wright Mansell methodology assumes the construction to take place during 2013 – 2016. Therefore, it makes sense that any summation of the impact from construction also include an annual average impact. This is particularly important when person years of employment are presented.

Person years of employment are often used interchangeably as jobs, but they are not jobs. They represent a full time equivalent one year of employment. Therefore if we want to discuss jobs, we need to divide by the life of the construction project—in this case four years. The figure should be presented as an annual average person years of employment to better compare it to the commonly understood notion of jobs. After holding a position for 10 years, no one would ever say they had 10 jobs. However, this is how person years of employment are often presented with IO analysis, and certainly the way they are presented in both Volume 2 and Volume 6C of the Enbridge Application.

Another issue regarding the reliability of the construction impact estimate is to ensure corporate overhead figures have not been included in the project budget, as to a large degree these expenses would be incurred regardless of whether or not Northern Gateway is built. The structure anticipated by the project is to see Northern Gateway Inc. as the general partner providing management and operating expertise on a chargeable basis to Northern Gateway, very similar as that provided to other limited partnership structures the company maintains.

Corporate umbrella expenses, such as Executive compensation, Board compensation, other senior management wages and salaries, construction insurance premiums, D&O (director and officers) insurance premiums, corporate overhead unrelated to salaries, capitalization of financing charges, etc. must be excluded from the \$5.5 project budget to avoid double counting of the projects impacts. None of these constitute net new benefits to GDP.

¹⁴³www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/764513/B47-28_-_Response_to_Province_of_BC_IR_No._2_-_A2I9K6?nodeid=764749&vernum=0 page 1.

Enbridge incurs direct board member costs of approximately \$3 million per year, and the executive compensation for its top six executives reached \$15.6 million in 2009. Other management and staff provide services on an ongoing basis to a number of limited partnership units on a fee for service basis. Although these expenses can reasonably be allocated on a pro rated bases for accounting purposes, they are not appropriate for IO analysis. None of these expenses should be included in the input number if we want to get a picture of the net impact of the capital project.

Although it is impossible to quantify the relative significance of these expenses to the overall capital budget, and Northern Gateway would need to provide an acknowledgment that an accounting of these overhead costs have been excluded from a revised capital budget, in 2010 Enbridge charged roughly 5% of the assets of EPP as overhead. This includes a charge of \$18 million related to fees Enbridge levied to EPP for costs incurred in cleaning up the Kalamazoo spill during 2010, which illustrates how corporate involvement by Enbridge, finds its way back into the limited partnership financial statements.

Notwithstanding that EPP is an operating facility as distinct from a construction project, this discussion is provided to illustrate how certain economies of scale exist within Enbridge that can readily be identified by Northern Gateway and need to be excluded from the capital budget. As well, Enbridge should exclude from its employment figures any activity undertaken by any of its more than 4,000 employees. Only new hires directly involved in the project should be included in the IO person years of employment input value.

IO models are incapable of reflecting economies of scale because they are linear. It becomes very important for the analyst, in developing the input estimate, to account for existing economies in the preparation of the data—whether these economies exist in dollars or personnel.

If we assume Enbridge overhead allocation of 10 – 20% during the construction phase of the project the capital budget would fall to between \$5 billion - \$4.4 billion. This figure would then need to be reduced by 40% (to net off the investment that would occur anyway) to arrive at a net capital injection into the economy resulting in a \$3 billion - \$2.6 billion capital expenditure.

The degree that Northern Gateway intends to contract the sophisticated services of a pipeline construction company to undertake the project, corporate overhead, and ongoing construction employment related to that company, should also be netted off the construction budget. Given the challenging nature of this pipeline from an engineering standpoint, Northern Gateway would be remiss not to contract an expert firm with years of experience. Because such a firm(s) would likely be undertaking other work, particularly since the oil fields are booming, to include their total cost in a construction estimate would incorporate another level of double counting.

As we can see, without getting into details regarding the specific employment generation assumed by the analysis during the indirect phases, if the input data is specified more appropriately, the outputs will be significantly reduced—maybe by as much as 50% - 60%. Until the input data is reliable, discussing the output benefits suggested to arise from the project's construction, in both Volume 2 and Volume 6C, is fruitless.

A re-specification of the capital investment, to take into account all the adjustments outlined

above as well as exclude any sunk costs borne by 2013, such as the \$250 million Enbridge states the approval process will require, (since the impacts of those expenditures will have been felt by 2013 and hence can not be considered as new impacts) needs to be developed and accepted as reliable, before an IO modeling to estimate its impact can be considered.

As a way to clearly address this issue, when a corporation sits down to decide among competing projects, it will undertake sophisticated modeling to get at the expected net present value of a project and compare this with alternatives. In identifying Northern Gateway, the decision is based on the net gain from allocating scarce capital resources to that project as compared with the next best alternative. If the return on Northern Gateway is 15%, that is not the benefit focused on if the next best alternative is 12%. The benefit is the 3% gain after the opportunity cost of the investment has been calculated.

In presenting the Northern Gateway case, however, the public is provided analysis as if its 15% or nothing. This is misleading and irresponsible. The construction impact of Northern Gateway should be compared against the net impact after adjusting for what would have taken place anyway (the opportunity cost of doing Northern Gateway), not a world where if not Northern Gateway—nothing.

2.3.5 Operational Impact of Northern Gateway

Wright Mansell has also provided a summary table of the pipeline operations impact derived from its IO analysis as part of Province of BC IR No.2. This table in its disaggregated form was not provided in the Wright Mansell Report. The table is provided in the link in the footnote¹⁴⁴ Without reproducing the table here, suffice is to say that the analysis incorporates pipeline revenues over a 30 year time horizon and predicts impacts for GDP, labour income, person years of employment and government revenues.

Prior to discussing the findings of the operational impact analysis it is critical to address the degree of error implicit in the input. That is, to the extent Northern Gateway revenues represent expenditures that would have taken place anyway to ship crude oil to Canadian and US markets, this is not a new level of expenditure in the economy. If revenues from Northern Gateway are to be considered, then lost revenues on other pipelines, railways, or other methods of transport, needs to be incorporated.

In summary, the Northern Gateway public interest case is based on no new production capacity being provided, just a redirection of that production capacity. As a result, any discussion of new beneficial impact from its operation is suspect

Assuming that there might be some net new operational benefit, a detailed analysis of the input figures netting off all displace transportation over the period is necessary, along with a netting out of any corporate overhead which exist without the pipeline. Until trustworthy input figures are available, any discussion of the operating impact as presented by Wright Mansell in Volume 2 and Enbridge in Volume 6C, is moot.

¹⁴⁴ https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624798/725347/B41-4_-_Response_to_Federal_Government_IR_No._1_-_A2E8J0?nodeid=725499&vernum=0 Page 24.

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Robyn Allan has had a lengthy and successful professional career in senior executive positions in the public and private sector with an emphasis on insurance, finance and real estate.

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