Canada's purchase of the Trans Mountain Pipeline – Financial and Economic Considerations

OFFICE OF THE PARLIAMENTARY BUDGET OFFICER
BUREAU DU DIRECTEUR PARLEMENTAIRE DU BUDGET

Ottawa, Canada
Originally Published: 31 January 2019
Revised: February 12, 2019
www.pbo-dpb.gc.ca

The Parliamentary Budget Officer (PBO) supports Parliament by providing economic and financial analysis for the purposes of raising the quality of parliamentary debate and promoting greater budget transparency and accountability.

The *Fall Economic Statement 2018* outlined the Government of Canada's $4.4 billion purchase of the Trans Mountain Pipeline, Trans Mountain Expansion Project, and related assets in August 2018.

This report provides a financial valuation of the purchased assets, estimates the valuation's sensitivity to several key factors, and projects the economic impact of the Expansion Project's construction activities.

Lead Analysts:
Varun Srivatsan, Research Assistant
Nigel Wodrich, Research Assistant

Contributors:
Chris Matier, Senior Director, Economic and Fiscal Analysis and Forecasting
Jason Stanton, Financial Analyst

This report was prepared under the direction of:
Jason Jacques, Senior Director, Costing and Budgetary Analysis

Nancy Beauchamp and Caroline Bernier assisted with the preparation of the report for publication.

For further information, please contact pbo-dpb@parl.gc.ca

Yves Giroux
Parliamentary Budget Officer

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Executive Summary

In August 2018, the Government of Canada purchased the Trans Mountain Pipeline (TMP), the Trans Mountain Expansion Project (TMEP) and related assets for $4.4 billion.

The Parliamentary Budget Officer (PBO) estimates that the TMP and TMEP have a value of between $3.6 billion and $4.6 billion. As such, the Government negotiated a purchase price at the higher end of PBO's valuation range. PBO's financial valuation assumes that the pipeline is built on time and on budget.

However, PBO's valuation does not include related assets that were bought as part of the acquisition, including multiple pipeline terminals and the Puget Sound Pipeline. Therefore, PBO's valuation would be understated relative to the total value of all the assets bought as part of the purchase.

One significant finding of this study is that a delay in completing construction, an increase in construction costs and/or changes in the risk profile of the TMEP (reflected by the discount rate) can negatively influence the final sale price that the Government can negotiate for the TMP, TMEP and related assets.

This is illustrated in Summary Table 1. It outlines a sensitivity analysis relative to the baseline scenario presented in Kinder Morgan's filings to the Securities and Exchange Commission[1], consisting of a $9.3 billion construction cost and a December 31, 2021 in-service date:

- Column 1 presents the change in value when construction costs increase or decrease by 10 per cent.
- Column 2 presents the change in value when the in-service date is one year sooner or later than December 31, 2021.
- Column 3 presents the change in value when the discount rate changes by 2 percentage points.

Summary Table 1

How construction costs, financing costs and delays in completing construction affect the value of the TMEP

$ Millions	**Construction Costs**	**In-service date of TMEP**	**Discount Rate**
	10 per cent change in costs	*1 year change in date*	*2 per cent point change in rate*
Lower/Shorter	453	744	1,803
Higher/Longer	(453)	(693)	(1,275)

Source: Parliamentary Budget Officer using data from Kinder Morgan 14-A filings

Summary Table 1 shows that a delay in completing construction by one year would reduce the value of the TMEP by $693 million. Similarly, a 10 per cent increase in construction costs would lower its value by $453 million.

This study also estimates that the peak annual impact on real gross domestic product (GDP) due to the construction of the TMEP would be 0.11 per cent in 2020; this would decline to 0 per cent from 2022 onwards. The impact on real GDP is concentrated in the period before and during construction.

The impact on employment would follow a similar pattern. Employment on the project would peak at 7,900 in 2020 and decline steadily thereafter.

The main benefit of the TMEP would arise from the increased capacity of Canadian producers to sell oil to export markets, which could lead to a reduction in the differential between Western Canadian Select (WCS) grade of crude oil and other grades, most notably West Texas Intermediate (WTI).

It is difficult to determine the impact of the TMEP on the price differential between WTI and WCS grades. However, recent PBO analysis determined that a reduction of US$5 per barrel in this gap would, on average, result in a 0.1 per cent increase in real GDP and a 0.3 per cent increase in nominal GDP.

That would translate into a $6 billion annual impact on GDP during the five-year period from 2019 to 2023.[2]

Increasing transportation capacity once the TMEP is operational could also increase the volume of oil being produced and exported by Western Canadian oil producers, which is another channel for economic impact.

1. Introduction

1.1. Background

On May 29, 2018, the Government of Canada announced its intention to acquire the entities controlling the Trans Mountain Pipeline (TMP), the Trans Mountain Expansion Project (TMEP) and related assets for $4.5 billion. Related assets include the Puget Sound Pipeline, Kamloops/Sumas/Burnaby Terminals and the Westridge Marine Terminal.[3] This purchase was completed in August 2018, for a final price of $4.4 billion, net of adjustments. Figure 1-1 contains a timeline of key developments.

The TMP is an existing pipeline system operating since 1953. It transports crude oil and refined products between Alberta, British Columbia, and Washington state over a span of 1,147 km and with a capacity of 300,000 barrels per day (bpd).[4] Currently, the TMP is the only major pipeline for Western Canadian oil producers to ship oil to Pacific Rim destinations, such as the US West Coast and Asia.[5]

In December 2013, Kinder Morgan applied to the National Energy Board (NEB) to construct and operate the Trans Mountain Expansion Project (TMEP). The project would twin the existing pipeline and expand the system's capacity by 540,000 bpd to 890,000 bpd.

In May 2016, the NEB concluded that the TMEP "is in Canada's public interest"; it recommended that the Governor in Council (GIC) approve the project, subject to 157 conditions.[6] The GIC issued an Order in Council granting approval, with those conditions, on November 29, 2016.[7]

As early as the first quarter of 2018, Kinder Morgan became "increasingly concerned" that without "active intervention from the Government of Canada", outstanding permits, approvals, and judicial reviews for the TMEP, as well as non-business risks outside the firm's control, would endanger the financial viability of the firm.[8]

In April 2018, Kinder Morgan announced the suspension of non-essential spending on the TMEP. It said that construction could not proceed without agreements with stakeholders to clarify the ability to construct the project and protect shareholders.

The ensuing negotiations between Kinder Morgan and the Government of Canada led to the Government's decision, announced on May 29, 2018, to acquire the TMP, TMEP, and related assets for $4.5 billion.

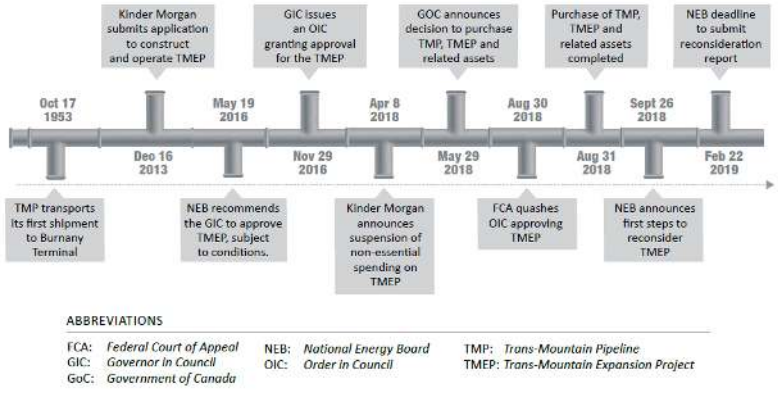
On August 31, 2018, this purchase was completed, net of adjustments, for approximately $4.4 billion. The Government deemed the purchase necessary to "secure [the] timely completion" of a project with "significant benefits […] to all Canadians."[9]

However, on August 30, 2018, the Federal Court of Appeal (FCA) quashed the Order in Council authorizing construction of the TMEP. The FCA ruling in *Tsleil-Waututh Nation v. Canada (Attorney General)* made two significant points:

- First, that "the [NEB's] process and findings were so flawed that the Governor in Council could not reasonably rely on the [NEB's] report," specifically in relation to the NEB's decision to exclude the impact of TMEP-related tanker traffic, especially on the Southern resident killer whale; and,
- Second, that "Canada failed to fulfil the duty to consult owed to Indigenous peoples."[10]

As of January 2019, construction activities on the TMEP continue to be suspended, pending the NEB's reconsideration of the project in light of the FCA's ruling. The Government directed the NEB to complete the reconsideration process and its resulting report by February 22, 2019.[11]

Figure 1-1 Timeline of key developments



Source: Parliamentary Budget Officer

1.2. Transaction and Ownership Structure

To finance the purchase of the entities related to the TMP and TMEP, Canada Trans Mountain Pipeline (TMP) Finance, a business entity wholly owned by Canada Development Investment Corporation (CDEV), borrowed $5.2 billion from the Canada Account administered by Export Development Canada. This

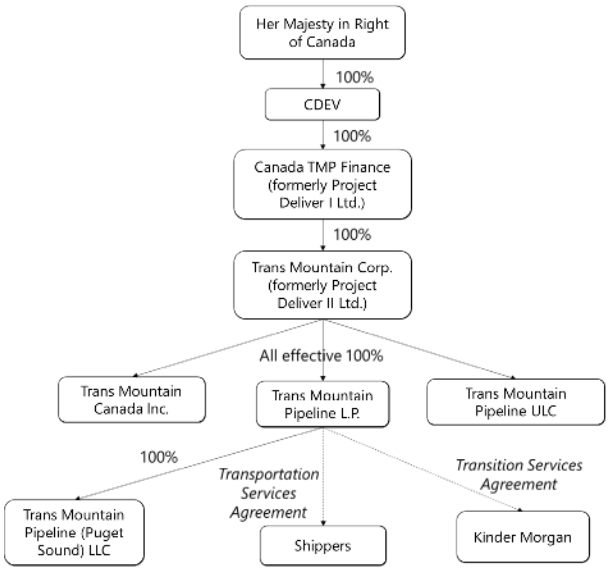
was effectively a loan from one Crown corporation to another and did not require Parliament's review.

$500 million of these borrowings were used to backstop a letter of credit to satisfy an NEB requirement for Trans Mountain Corp. to have financial resources to pay for environmental damages. Of the remaining $4.7 billion, $4.4 billion was paid to Kinder Morgan Canada Inc., while the balance was made available to fund working capital requirements. [12]

The ownership structure involves multiple business entities that manage the acquisition, financing, strategic direction, operations and employees of the pipeline system. The relationships among these entities are outlined in Figure 1-2.

The Government stated that it does not intend to own the Trans Mountain assets over the long-term. It intends to sell the assets to a party willing to tolerate the TMEP's business risks and able to see the TMEP to completion. As a result, CDEV is expected to "maintain readiness on an ongoing basis" to sell the Trans Mountain assets.[13]

Figure 1-2 Ownership Structure



Mandates of entities

Canada Development Investment Corporation (CDEV): Provide commercial vehicle for Government equity investment and to manage and sell commercial holdings of the Government

Canada Trans Mountain Project (TMP) Finance: Acquire, finance and provide strategic direction to Trans Mountain Corporation (TMC)

Trans Mountain Corp. (TMC): Own and manage entities that operate the Trans Mountain Pipeline System (TMP)

Trans Mountain Pipeline (TMP) ULC: General Partner of TMP

Trans Mountain Pipeline L.P.: Operator of TMP

Trans Mountain Canada Inc.: Employer of TMP employees

Trans Mountain Pipeline (Puget Sound) LLC: Operator of Puget Sound pipeline

Source: Parliamentary Budget Officer based on a flowchart by Canada Development Investment Corporation[14]

2. Financial Valuation

PBO uses two types of analyses to assess the value of the purchase:

- Discounted cash flow (DCF) analysis: Assessing the value of the TMP and TMEP based on the present value of future cash flows it is expected to generate.
- Comparables analysis: Assessing the value of the TMP based on key valuation metrics of similar companies in the same industry.

For illustrative purposes, a list of key pipeline transactions undertaken in the past seven years is also presented in Appendix A.

PBO requested information from the Department of Finance regarding the valuation of the purchase of the TMP and TMEP. However, Finance classified the information provided as confidential. Therefore, PBO used publicly available sources in its analysis, while the information provided by Finance was used to guide and validate this analysis.

2.1. Discounted Cash Flow Analysis

Pipelines typically generate steady cash flows over a long period of time given that, as monopolies, their revenues are regulated. In the case of the TMP and TMEP, the revenues they can collect (referred to as tolls) are negotiated, agreed upon and regulated by the NEB.

These toll settlements are periodically renewed, with the most recent being the 2016-18 Incentive Toll Settlement (ITS).[15] Tolls are calculated based on the costs a pipeline company can recover from shippers, and a rate of return on rate base (equivalent to a return on investment). Appendix B expands on how tolls are calculated.

Offsetting these regulated toll revenues are ongoing expenses such as those related to operating and maintaining the pipeline.

Table 2-1 presents PBO's unlevered discounted cash flow analysis for the TMP based on Kinder Morgan's 14-A filings.[16] "Unlevered" in this context means that it is assumed there is no debt and no interest expense.

PBO calculations found a cumulative total discounted cash flow (DCF) of $2,024 million compared to Kinder Morgan's 14-A filings which report $2,012 million. Both figures include a salvage value of $250 million. This is a difference of $12 million, which is negligible for a revenue stream spanning four decades.[17] [18]

Table 2-2 presents PBO's unlevered discounted cash flow analysis for the TMEP based on Kinder Morgan's 14-A filings. PBO calculations found a cumulative total DCF of $1,581 million compared to Kinder Morgan's 14-A filings which reported $1,394 million. This is a difference of $187 million. This is within an acceptable range given the long time horizon of the project.[19] [20]

Table 2-1 Unlevered DCF Analysis of TMP ("Base Trans Mountain")

	Contracted Period								Fee-for Service			
$ Millions	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2030**	**2040**	**2050**	**2059**
Unlevered Free Cash Flow	72	149	161	162	129	128	129	127	117	84	57	53
Discount Factor	1.00	0.94	0.89	0.84	0.79	0.75	0.70	0.67	0.50	0.28	0.15	0.09
Discounted Cash Flow	72	141	143	136	102	96	91	84	58	23	9	5
Cumulative Total	72	213	356	492	594	690	781	865	1,205	1,572	1,716	1,774

Source: Parliamentary Budget Officer using data from Kinder Morgan 14-A filings

Notes: These calculations assume a discount rate of 6 per cent, as presented in Kinder Morgan 14-A filings

Table 2-2 Unlevered DCF Analysis of TMEP ("Trans Mountain Expansion")

	Contracted Period								Fee-for Service			
$ Millions	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2030**	**2040**	**2050**	**2059**
Unlevered Free Cash Flow	(724)	(1,796)	(3,066)	(1,365)	936	1,074	993	1,003	1,068	1,340	417	79
Discount Factor	1.00	0.91	0.83	0.75	0.68	0.62	0.56	0.51	0.32	0.12	0.05	0.02
Discounted Cash Flow	(724)	(1,633)	(2,534)	(1,026)	639	667	561	515	340	165	20	2
Cumulative Total	(724)	(2,357)	(4,891)	(5,916)	(5,277)	(4,610)	(4,049)	(3,535)	(1,513)	830	1,512	1,581

Source: Parliamentary Budget Officer using data from Kinder Morgan 14-A filings

Notes: These calculations assume a discount rate of 10 per cent, as presented in Kinder Morgan 14-A filings

The sum of the cumulative total discounted cash flow for TMP ($2,024 million) and TMEP ($1,581 million) results in an overall value of $3.6 billion. This is the lower bound of PBO's valuation. It does not include the value of related assets acquired.[21]

Discount Rate Calculations

The discount rate is a key variable in calculating the net present value (NPV) of any investment or business entity. Changes to the rate, both positive and negative, can have a significant impact on the valuation of an asset.

PBO tried to recalculate the discount rate used in Kinder Morgan's 14-A filings from August 2018 (6 per cent for the TMP; 10 per cent for the TMEP, reflecting the uncertainties surrounding the TMEP's projected in-service date and construction costs).

PBO used publicly available data, including data for comparable Canadian firms, to determine the discount rate. This includes the return on equity, return on debt, and the overall weighted average cost of capital.[22]

PBO's calculations yielded a discount rate of 5.66 per cent, which is roughly equivalent to Kinder Morgan's discount rate for the TMP. However, it is significantly lower than the discount rate used for the TMEP.

The 4-percentage point premium is attributable to the TMEP's greater risks, including those associated with permitting and construction of the TMEP.

In addition, Kinder Morgan's discount rate calculations likely incorporated additional proprietary information to which PBO did not have access to, including greater knowledge of potential risks of the TMEP.

Given the foregoing, PBO decided to retain the discount rate of 10 per cent as a baseline. The impact of changes in the discount rate to the NPV is considered in Section 3.

2.2. Comparables Analysis

Comparables analysis considers key valuation metrics of similar companies in the same sector, operating on the assumption that they must have similar valuation metrics.

Table 2-3 shows three valuation metrics for selected publicly-listed firms operating pipelines in Canada: the enterprise value (EV); earnings before interest, taxes, depreciation and amortization (EBITDA); and the EV/EBITDA ratio.

The selection shows EV/EBITDA ratios ranging between approximately 10.0x and 21.0x, with an average of 14.0x.

Table 2-3 EV/EBITDA for Canadian pipeline companies

$ Billions

Company	EV	EBITDA	EV/EBITDA
Enbridge	155.4	10.4	15.0
TransCanada Corp.	101.1	7.4	13.7
Pembina Pipeline Corp.	31.8	2.0	15.9
Inter Pipeline Inc.	13.7	1.3	10.9
AltaGas Ltd.	16.1	0.8	20.8
Keyera Corp.	8.1	0.8	10.5
Gibson Energy Inc.	4.1	0.4	11.1
Average	47.2	3.3	14.0

Source: Parliamentary Budget Officer using data from Yahoo Finance, as of December 12, 2018

Notes: EV/EBITDA is a financial ratio, and is expressed in absolute terms

Using comparables analysis, PBO calculated a value of $2.8 billion for the TMP. This is based on Kinder Morgan's average EBITDA forecast for the TMP over the medium term, as reported in its 14-A filing.

With the cumulative total discounted cash flow for the TMEP of $1,581 million, as well as the $250 million TMP salvage value, the overall value is $4.6 billion. This is the upper bound of PBO's valuation. It does not include the value of related assets acquired and represents the value under the baseline scenario.

3. Sensitivity Analysis

Discount Rate and Net Present Value (NPV)

The **discount rate** is the rate at which the present value of future cash flows is determined. This rate accounts for the time value of money: money received now is preferred to money received in the future as it can be invested and reap a return.

Discount rates for specific projects can change based on the perceived risk and the cost for firms to obtain financing to undertake investments.

Changes to the discount rate can have a significant effect on the value of an asset.

In the case of the TMP and TMEP, this can affect the ultimate sale price for the Government's assets.

The **net present value (NPV)** is the sum of the present value of cash flows and future expenses using the discount rate. The NPV of an asset is an important indicator of its value.

PBO considered three key factors that significantly affect the value of the Government of Canada's purchase:

- The in-service date of the TMEP;
- The construction costs of the TMEP; and
- The discount rate used in the TMEP valuation.

The first two factors affect the net present value (NPV) of the TMEP only, and not the TMP, since the former has not yet been constructed and put into service. Therefore, PBO's sensitivity analysis applies to TMEP only. TMP's NPV of $1.77 billion is considered constant in all scenarios.

Table 3-1 highlights the impact of the discount rates used and the in-service date of the pipeline on the NPV of the TMEP. Choosing a higher discount rate and/or a later in-service date (more delays) would reduce the NPV of the project. For example, a one-year delay would reduce the NPV of the TMEP by $693 million to $888 million.

Table 3-1

Net present value of TMEP, based on different operational dates and discount rates

$ Millions	**Discount Rate**				
In-service date	**8 per cent**	**9 per cent**	**10 per cent**	**11 per cent**	**12 per cent**
Dec 31st 2020	4,136	3,153	2,325	1,624	1,027
Dec 31st 2021	3,384	2,403	1,581	890	306
Dec 31st 2022	2,672	1,698	888	212	(354)
Dec 31st 2023	2,059	1,099	306	(350)	(896)

Source: Parliamentary Budget Officer using data from Kinder Morgan 14-A filings

Notes: These figures are calculated assuming a $9.3 billion construction cost. Changes to the in-service date may have an additional impact on NPV through toll adjustments due to interest charges during construction. This analysis does not incorporate the impact of these toll adjustments.

Furthermore, an increase in construction costs can decrease the NPV of the TMEP, as shown in Table 3-2. Hence, a 10 per cent increase in construction costs would reduce the NPV of the TMEP by $453 million, to $1,128 million.[23]

Table 3-2 Net present value of TMEP, based on different operational dates and construction costs

$ Millions	**Construction Costs**		
In-service date	**$8.4 billion (10 per cent lower costs)**	**$9.3 billion (Base scenario)**	**$10.4 billion (10 per cent higher costs)**
Dec 31st 2020	2,778	2,325	1,871
Dec 31st 2021	2,034	1,581	1,128
Dec 31st 2022	1,340	888	434
Dec 31st 2023	729	306	(187)

Source: Parliamentary Budget Officer using data from Kinder Morgan 14-A filings

Notes: These figures are calculated assuming a 10 per cent discount rate. Construction costs for the TMEP have a capped (76 per cent) and uncapped (24 per cent) portion. Uncapped costs are passed on the shippers in the form of increased tolls. PBO's sensitivity analysis of construction costs take this into account, assuming symmetric impacts (that is, a 10 per cent change in construction costs would affect only 7.6 per cent of distributable cash flows.)[24]

4. Economic Impact

The TMEP could have significant economic impacts, stemming from the construction of the asset itself and from its eventual operation. Construction impacts include the money spent to build the pipeline, the multiplier effect from that economic activity and jobs created during construction.

Operating impacts could include revenues from increased shipments, activity generated by the operation of the pipeline, as well as a reduction in the price differential between West Texas Intermediate (WTI) and Western Canadian Select (WCS).

PBO assumed a total construction cost of $9.3 billion and an in-service date of December 31, 2021, as quoted in Kinder Morgan Canada Limited's August 2018 14-A filings. Deducting implicit financing costs, which do not have a direct economic impact, total TMEP spending equals $8.3 billion.[25]

Projected spending outlays were inputted to PBO's macroeconomic model, which also considers the prospective monetary policy response to an increase in domestic economic activity. Based on PBO's model, the multiplier associated with non-residential construction is estimated to average 0.9. That is, for every $100 spent on constructing the pipeline in a given year, $90 in real GDP would be generated.

Prior to 2018, $930 million was spent in construction activities. These funds were part of the total construction cost but were not included in PBO's economic impact calculations. The results are presented in Table 4-1.

Table 4-1 Economic impact of TMEP construction with a monetary policy response

	2018	2019	2020	2021	2022	2023	2024	Peak impact
TMEP spending ($ millions)	960	1,859	3,172	1,420	38	-	-	8,277 (total)
Real GDP Impact (per cent)	0.03	0.06	0.11	0.04	0.00	0.00	0.00	0.11
Employment Impact ('000s)	1.1	4.8	7.9	7.1	3.7	1.9	1.2	7.9

Source: Parliamentary Budget Officer

Note: The baseline scenario underlying these estimates are from PBO's *Economic and Fiscal Outlook October 2018*.[26] The "TMEP spending" line item includes $930 million in pre-2018 spending that is part of the $9.3 billion construction cost.

PBO estimates that the peak annual real GDP impact due to the construction of TMEP will be 0.11 per cent in 2020 which falls to zero from 2022 onwards. The impact on real GDP is concentrated before and during construction.

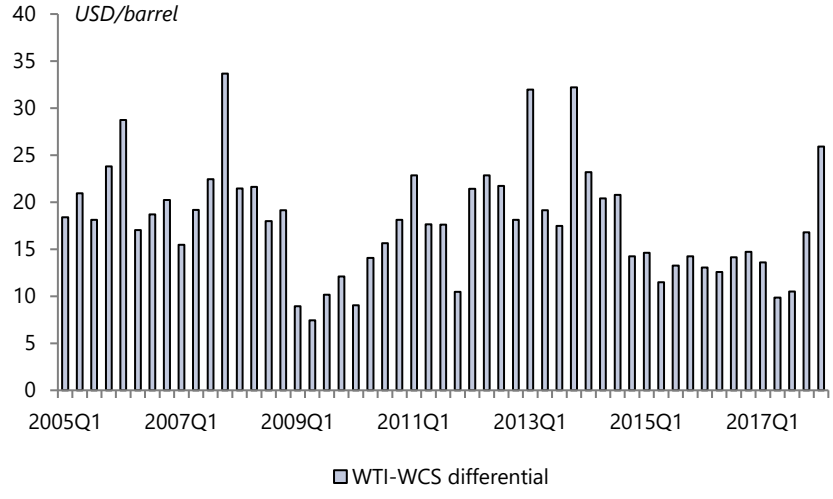
The impact on employment would follow a similar pattern with a peak annual employment impact of 7,900 jobs added in 2020 and decline steadily thereafter. These impacts may vary based on the final construction cost of and timeframe to complete the TMEP.

Although we do not consider the impact of increased shipments that would occur when the TMEP is operational, PBO's *Fall Economic Statement 2018: Issues for Parliamentarians* provides useful information on the impact of a reduction in the WTI-WCS differential on Canada's GDP.[27]

In that report, PBO estimated that increasing transportation capacity for oil in Canada is expected to have an impact on the WTI-WCS price differential. This is the difference between prices of West Texas Intermediate grade of crude oil (benchmarked at Cushing, Oklahoma) and Western Canada Select grade (benchmarked at Hardisty, Alberta).

It is difficult to determine the impact of the TMEP on the WTI-WCS price differential. However, recent PBO analysis determined that a reduction of US$5 per barrel in this gap would, on average, result in a 0.1 per cent increase in real GDP and a 0.3 per cent increase in nominal GDP. This would translate into a $6 billion annual GDP impact from 2019 to 2023.[28]

Figure 4-1 WTI-WCS differential



Source: Parliamentary Budget Officer

Appendix A: Precedent Transactions

Precedent transactions analysis is often used in financial valuations. These transactions consist of those similar in nature to the transaction of interest.

To establish precedent transactions for TMP and TMEP, PBO considered pipeline acquisitions that have taken place in Canada and United States since 2011. These transactions are presented in Table A-1.

The sample includes transactions valued higher and lower than the Government of Canada's Trans Mountain purchase. The Enterprise value/Earnings before interest, taxes, depreciation and amortization (EV/EBITDA) ratio ranges between 8.0x and 16.0x, with an average of 11.3x. The average transaction value is $2.34 billion.

Table A-1 Precedent Transactions

Date	Acquirer	Target	Asset	Value ($ millions)	EV/EBITDA
8/2/18	Wolf Midstream	MEG Energy	50 per cent interest in Access Pipeline and 100 per cent interest in Stonefell Terminal	1,610	13.4x
22/9/17	Pembina Pipeline Corp.	Veresen	Veresen	9,700	15.8x
1/3/17	MPLX LP	Enbridge	Ozark pipeline	219	-
7/10/16	Southern Company	Kinder Morgan Inc.	50 per cent Interest in Southern Natural Gas Pipeline System	1,470	10.4x
14/7/16	Wolf Midstream	Devon Energy Corp	50 per cent stake in Access Pipeline from Devon Energy	1,400	10.1x
29/3/16	Tallgrass Energy	Sempra Energy	25 per cent interest in Rockies Express Pipeline LLC	436	11.0x
3/8/15	NextEra Energy	NET Midstream	NET Midstream	2,100	-
23/12/14	Enbridge Energy Partners LP	Enbridge Inc.	Remaining 66.7 per cent interest in the Alberta Clipper Pipeline's U.S. segment	1,000	10.7x
6/11/14	Plains All American Pipeline	Occidental Petroleum Corp.	50 per cent interest in BridgeTex Pipeline Company LLC	1,075	10.5x
27/10/14	ONEOK Partners LP	Mesquite Pipeline Company and Chevron Corporation	Mesquite Pipeline Company and 80 per cent Stake in West Texas LPG Pipeline Limited Partnership	800	-
29/9/14	EnLink Midstream Operating LP	Chevron Corporation and Chevron Midstream Pipelines	Gulf Coast Natural Gas Pipeline Assets	235	-
11/12/12	Spectra Energy	Borealis Infrastructure, Ontario Teachers' Pension Plan, Kinder Morgan Energy Partners	100 per cent interest in Express-Platte Pipeline System	1,490	11.5x
20/8/12	Tallgrass Energy Partners	Kinder Morgan Energy Partners	Kinder Morgan Interstate Gas Transmission, Trailblazer Pipeline Company, Casper-Douglas, West Frenchie Draw & 50 per cent interest in REX	1,800	8.3x
19/7/11	Energy Transfer Equity	Southern Union Company	Southern Union Company	9,400	11.5x
		Average		2,338	11.3x

Source: Parliamentary Budget Officer using data from Kinder Morgan 14-A filings, media releases and company disclosures

Appendix B: Toll Calculations

Tolls are the primary means by which a pipeline operator earns revenue. In the case of the TMP and TMEP, these tolls are charged to shippers based on the distance the petroleum travels, the type of petroleum (from light to heavy crude) and the type of service (committed or uncommitted). These tolls are strictly regulated by the National Energy Board (NEB).

For the existing system, tolls are calculated based on the revenue requirement, which includes the costs the pipeline company can recover from shippers. The revenue requirement is based on, among other factors, operating and maintenance costs, depreciation and the rate of return on rate base.

The rate base is the investment made in the pipeline system from which a return is calculated; it is equivalent to a return on investment. For 2017 and 2018, this return was 7.025 per cent. This can ultimately vary depending on actual costs and revenues.[29]

Tolls are paid by shippers for the use of pipeline capacity. For the TMEP, part of the capacity is committed (80 per cent), that is, shippers are contractually obligated to ship a certain volume of petroleum (or pay for that capacity in case shippers do not use it). The uncommitted capacity (20 per cent) is what is available over and above the committed capacity.

In the case of TMP and TMEP, a bid premium is offered by uncommitted shippers if the petroleum is nominated at the Westridge Terminal (Westridge dock bid premium).

Nomination refers to the process by which a pipeline company finds out how much volume its customers would like to ship monthly. If the total volume of nominations for uncommitted capacity is more than what is available, the pipeline company must "apportion" the nominations.[30]

These bid premiums are used to allocate the capacity at the Terminal facility. Incremental revenues resulting from accepted bids are refunded back to all shippers via a lower revenue requirement (or via a lower variable toll in the case of the TMEP).

Uncommitted capacity to the Westridge dock would be allocated using the bid process, whereas uncommitted capacity to a land destination would be allocated on a pro-rata (proportional) basis based on nominated volumes.

The unit used to calculate the amount of petroleum being transported is cubic meter-kilometers, (also known as billing determinants). These units represent volumes adjusted for the distance travelled in the pipeline.

Together, the revenue requirement and billing determinants set the unit tolls that the pipeline operator must charge for the existing system.[31]

Notes

1. Schedule 14A, is a proxy statement required by the Securities and Exchange Commission (SEC) when a shareholder vote is held.

2. Fall Economic Statement 2018: Issues for Parliamentarians. https://www.pbo-dpb.gc.ca/web/default/files/Documents/Reports/2018/FES%202018/FES_2018_EN_FINAL.pdf

3. The related assets consist of:

   (i) The Puget Sound pipeline system, a 111-kilometre spur from the TMP to refineries in Washington state. It transports up to 240,000 bpd. PBO could not access publicly-available data to make financial estimates surrounding the Puget Sound pipeline system. The Puget Sound pipeline system is significantly shorter than the TMP and transports less product, therefore, its cash flows and valuation are expected to be only a fraction of the TMP's.

   Trans Mountain Pipeline System. https://www.transmountain.com/pipeline-system

   (ii) Terminals to temporarily store products transported by pipeline in Edmonton, Kamloops, Abbotsford (Sumas terminal), and Burnaby (Burnaby and Westridge terminals). Their value is inextricably linked to the TMP. Notably, the Edmonton terminals consist of 35 storage tanks, 20 of which are leased and produce revenues. In September 2018, these lease revenues amounted to $5 million, compared with $27 million for the TMP and Puget Sound pipelines. There was not enough publicly-available data for PBO to conduct a financial valuation of these assets. Of the $27 million in revenues for the TMP, less than 10% originated from outside Canada.

   Canada Development Investment Corporation: Third Quarter Report. https://www.cdev.gc.ca/wp-content/uploads/2018/12/CDEV-Q3-2018-Report.pdf

   Kinder Morgan Canada Limited. "Strategic Assets Positioned to Support Growing Oil Sands Production."

   https://www.kindermorgancanadalimited.com/

4. National Energy Board (2016). National Energy Board Report: Trans Mountain Expansion Project (Filing A77045). https://apps.neb-one.gc.ca/REGDOCS/Item/Filing/A77045

5. Over its lifetime, the TMP has had several private sector owners and operators – most recently, subsidiaries of Kinder Morgan International and Kinder Morgan Canada Limited (Kinder Morgan).

6. Ibid.

7. Natural Resources Canada (2016). "Government of Canada announces pipeline plan that will protect the environment and grow the economy". https://www.canada.ca/en/natural-resources-

canada/news/2016/11/government-canada-announces-pipeline-plan-that-will-protect-environment-grow-economy.html

8. Kinder Morgan Canada Limited (2018). Form 14-A Filings to the Securities and Exchange Commission, filed August 7, 2018.
9. Department of Finance (2018). Backgrounder: Details of Agreement for the Completion of the Trans Mountain Expansion Project. https://www.fin.gc.ca/n18/data/18-038_1-eng.asp
10. Tsleil-Waututh Nation v. Canada (Attorney General), 2018 FCA 153
11. National Energy Board (2018). National Energy Board reconsideration of aspects of its Recommendation Report as directed by Order in Council P.C. 2018-1177 (File OF-Fac-Oil-T260-2013-03-59)
12. Canada Development Investment Corporation: Third Quarter Report. http://cdev.gc.ca/en/pdf/CDEV%20Q3%202018%20Report.pdf
13. Canada Development Investment Corporation (2018). Minister's Letter of Expectations. Retrieved from https://www.cdev.gc.ca/wp-content/uploads/2018/12/Ministers_Letter_August-27_-2018.pdf.
14. Ibid.
15. National Energy Board: Application for 2018 Final Tolls. https://apps.neb-one.gc.ca/REGDOCS/Item/View/3546262
16. Schedule 14A, is a proxy statement required by the Securities and Exchange Commission (SEC) when a shareholder vote is held.
17. The PBO made assumptions regarding the timing of certain cash flows, specifically during time periods for which cash flows were not identified. This may explain the difference between PBO's and Kinder Morgan's 14-A figures.
18. PBO calculations include a salvage value of $250 million for the TMP that is also reported in Kinder Morgan 14-A filings.
19. Ibid.
20. The PBO made assumptions regarding the timing of certain cash flows, as only summarized information was available through Kinder Morgan 14-A filings. In addition, it is assumed that there is no salvage value for the TMEP, and related assets bought in the purchase are not part of the valuation. These three factors may account for the difference between Kinder Morgan's and PBO's figures.
21. Given that this is an unlevered DCF analysis, it is assumed TMEP does not hold debt. However, CDEV's subsidiary, TMP Finance, has borrowed $5.2 billion from EDC's Canada Account to finance the acquisition, with an annualized interest rate of 4.7 per cent. These interest expenses would continue to accrue to the TMEP until the loan is repaid. CDEV's quarterly report notes that $21 million in interest expense was payable in the final quarter of 2018.

    Canada Development Investment Corporation: Third Quarter Report. http://cdev.gc.ca/en/pdf/CDEV%20Q3%202018%20Report.pdf
22. The cost of equity, a theoretical rate of return to investors, was calculated using the Capital Asset Pricing Model. The key variables used in this calculation are the beta, equity risk premium, and the risk-free rate of return.

Beta, which refers to the riskiness of an investment into a firm relative to the average market risk, was calculated using public data for comparable firms.

Yahoo Finance. Accessed December 12, 2018. https://ca.finance.yahoo.com/

The equity risk premium and risk-free rate of return are based on Duff and Phelps U.S. Equity Risk Premium Recommendation.

https://www.duffandphelps.com/insights/publications/cost-of-capital/us-equity-risk-premium-recommendation-2017

The rate of 5.02 per cent for the cost of debt is based on Kinder Morgan's 10-K filings.
Kinder Morgan Inc. Form 10-K.

https://www.sec.gov/Archives/edgar/data/1506307/000150630718000010/kmi-2017x10k.htm

The corporate tax rate of 27 per cent is based on Kinder Morgan's 14-A filings. Kinder Morgan Inc. Schedule 14-A

https://www.sec.gov/Archives/edgar/data/1714973/000104746918005465/a2236353zdefm14a.htm

The weighted average cost of capital (WACC), which is the overall discount rate, is calculated based on the following formula:

$$WACC = \frac{E}{D+E} \times r_e + \frac{D}{D+E} \times r_d \times (1-t)$$

where E refers to the equity value, D refers to the value of debt, r_e refers to the cost of equity, r_d refers to the cost of debt and t refers to the corporate tax rate.

23. The sensitivity analysis for construction costs is related to the "Growth Capex" line item in Kinder Morgan's 14-A DCF valuation. The "Growth Capex" line item adds up to $7 billion, while PBO's baseline construction cost is $9.3 billion. Although the "Growth Capex" line item and the total construction cost do not equal each other, the PBO assumes the linear shock on the NPV represented when shifting the "Growth Capex" line item by 10 per cent is equivalent when shifting the construction cost by 10 per cent.
24. Kinder Morgan Canada Ltd. Prospectus. May 25, 2017. https://www.kindermorgancanadalimited.com/content/docs/prospectus.pdf
25. This calculation accounts for an allowance for funds used during construction (AFUDC), which are capitalized interest charges that do not have a direct economic impact during construction. PBO calculated a proxy ratio of AFUDC to capital spending (11%) based on NEB's 2018 Final Toll Calculations.

    National Energy Board (2018). Trans Mountain Pipeline L.P.: 2018 Final Toll Calculation Schedules pursuant to the 2016 - 2018 Incentive Toll Settlement
26. Economic and Fiscal Outlook October 2018. https://www.pbo-dpb.gc.ca/web/default/files/Documents/Reports/2018/EFO%20Oct%202018/EFO_OCT2018_EN.pdf

27. Fall Economic Statement 2018: Issues for Parliamentarians. https://www.pbo-dpb.gc.ca/web/default/files/Documents/Reports/2018/FES%202018/FES_2018_EN_FINAL.pdf

28. Ibid.

29. National Energy Board (2018). Trans Mountain Pipeline L.P.: 2018 Final Toll Calculation Schedules pursuant to the 2016 - 2018 Incentive Toll Settlement

30. National Energy Board. Market Snapshot: What is Pipeline Apportionment? https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/snpsht/2018/08-03pplnpprtnmnt-eng.html

31. The PBO consulted with the NEB to collect information on the regulatory framework for tolls and tariffs.