National Energy Board

Office national de l'énergie

Canadian Hydrocarbon **Transportation** System

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TRANSPORTATION ASSESSMENT • August 2005

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FIGURES

TABLES

Acronyms and Abbreviations

AOS	Authorized Overrun Service
Alliance	Alliance Pipeline Ltd.
B.C. System	TCPL B.C. System
Chevron	Chevron Canada Limited
Cochin	Cochin Pipe Lines Ltd.
DBRS	Dominion Bond Rating Service
EBIT	Earnings Before Interest and Taxes
Enbridge	Enbridge Pipelines Inc.
Express	Express Pipeline Limited Partnership
FFO	Funds from Operations
Foothills	Foothills Pipe Lines Ltd.
FT	Firm transportation
IPI	Implicit Price Index
IT	Interruptible transportation
LNG	Liquefied natural gas
M&NP	Maritimes and Northeast Pipeline
MPL	Montreal Pipe Line
NEB or Board	National Energy Board
PNGTS	Portland Natural Gas Transmission System
ROE	Return on Equity
S&P	Standard & Poor's
SOEI	Sable Offshore Energy Inc.
T-South	Transportation South Zone on Westcoast
Terasen (TMPL)	Terasen Pipelines (Trans Mountain) Inc.
TNPI	Trans-Northern Pipeline Inc.
TQM	Trans Québec & Maritimes Pipeline Inc.
TransCanada or TCPL	TransCanada PipeLines Limited
U.S.	United States
WCSB	Western Canada Sedimentary Basin
Westcoast	Westcoast Energy Inc.

Units

Bcf	Billion cubic feet
Bcf/d	Billion cubic feet per day
MMcfd	Million cubic feet per day
GJ	Gigajoule
m^3/d	Cubic metres per day
$10^3m^3/d$	Thousand cubic metres per day
MW	Megawatt

FOREWORD

As part of its regulatory mandate, the National Energy Board (the Board or NEB) continually monitors energy and transportation markets to ensure that Canadians derive the benefits of economic efficiency. To further assist in its monitoring efforts, the Board identified a need in its *2004-2005 Report on Plans and Priorities* to implement a performance measurement system for pipeline tolls and tariffs, including the financial health of the pipeline industry.

This report provides an assessment of how the Canadian hydrocarbon transportation system is currently functioning and sets out the framework the Board will use for future assessments.

The data contained within this report is based on publicly available information collected and monitored by NEB staff. In identifying some of the emerging issues around the transportation system, the Board also benefited from discussions with members of the investment community. A draft of the report was sent to the Canadian Energy Pipeline Association and the Canadian Association of Petroleum Producers for comment prior to its release.

Any comments on the report or suggestions for further analysis can be directed to:

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If a party wishes to rely on material from this report in any regulatory proceeding, it can submit the material as it can submit any public document. In such a case, the material is in effect adopted by the party submitting it and that party could be required to answer questions on it.

INTRODUCTION

The Canadian hydrocarbon transportation system moves over $100 billion in petroleum products and natural gas to Canadians and export markets each year. In 2004, energy export revenue was almost $59 billion, accounting for about 15 percent of total Canadian exports. Energy is essential to our daily lives and the ability of the pipeline transportation system to reliably and efficiently deliver this energy is critical to our country's economic well-being. The Board regulates the physical and financial operations of pipelines that cross interprovincial boundaries and the international boundary.

The Board has developed five corporate goals to ensure that its regulatory program provides value to Canadians. The third goal is that "Canadians derive the benefits of economic efficiency". To determine whether this goal is being achieved, the Board monitors energy and transportation markets for evidence that they are working well.

Each year the Board issues various Energy Market Assessment reports that focus on different aspects of Canadian energy markets. This is the first time that the Board has issued a report that focuses on the functioning of the Canadian hydrocarbon transportation system.

This report is similar to the Board's other market monitoring reports and its intent is to assess how well the Canadian hydrocarbon transportation system is working and to outline a system to monitor and measure the performance of the transportation system from year to year. This report should not be read as a regulatory document, like a Reasons for Decision. In this report, the Board is not making a determination on regulatory matters such as the appropriate rate of return on equity that should be earned by pipeline companies. Thus, the factors on which the functioning of the transportation system is assessed are not the same as those which are applied in a regulatory proceeding.

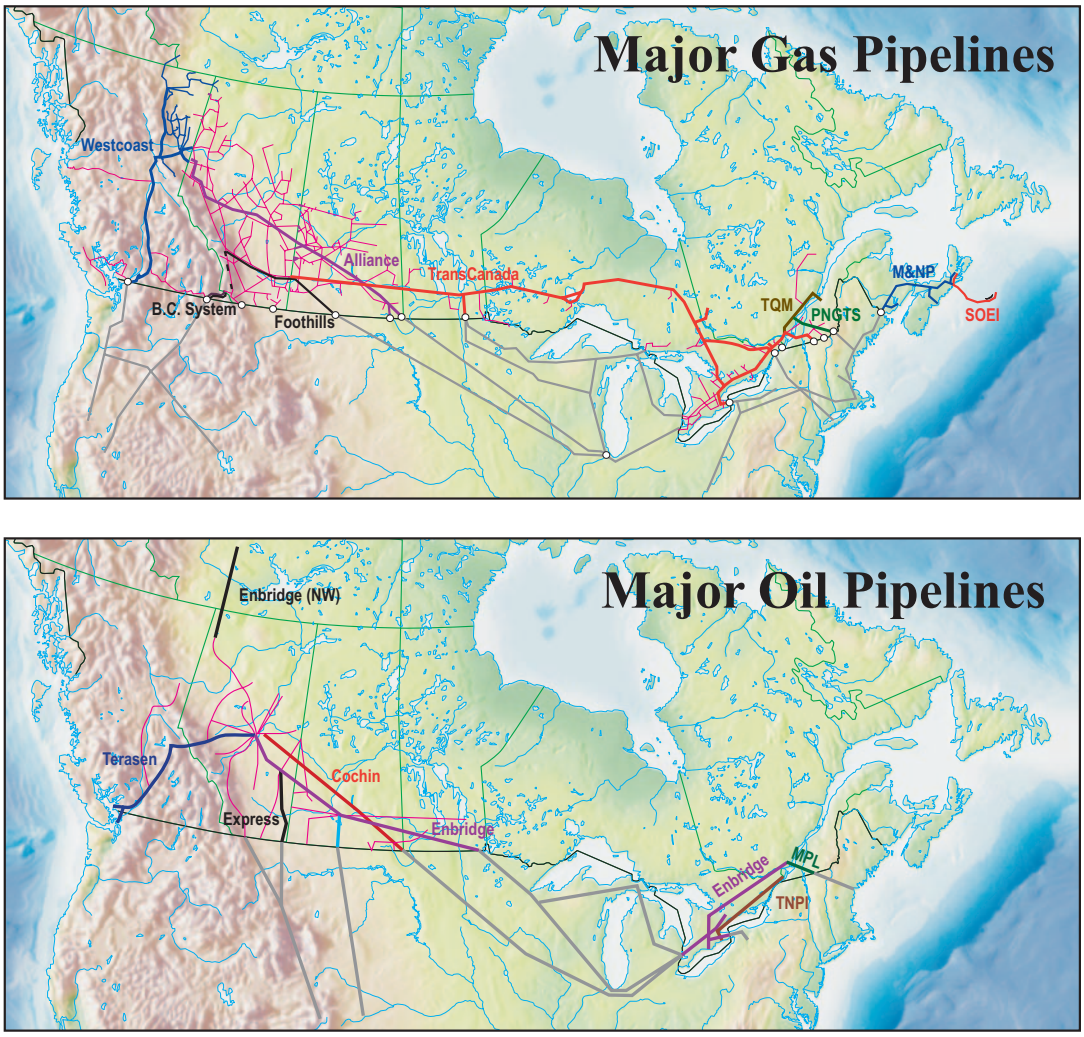
For the transportation system to work well, the Board believes that the following three outcomes should be achieved:

1. there is adequate pipeline capacity in place to move products to consumers who need them;
2. pipeline companies are providing services that meet the needs of shippers at reasonable prices; and
3. pipeline companies have adequate financial strength to attract capital on terms and conditions that enable them to effectively maintain their systems and build new infrastructure to meet the changing needs of the market.

To assess the extent to which these outcomes are being achieved, the Board used publicly available data for Group 1 regulated companies (see Figure 1). This group comprises the major pipeline companies that are subject to ongoing regulatory oversight by the Board. As these companies represent a major part of the Canadian transportation system, the data from these companies provides a good view into the overall functioning of the transportation system.

FIGURE 1

Gas and Oil Pipelines Regulated by the National Energy Board



THE CANADIAN HYDROCARBON TRANSPORTATION SYSTEM

2.1 Adequacy of Pipeline Capacity

A key measure of the efficient operation of energy markets is that there is adequate pipeline capacity to transport crude oil, refined products, natural gas and natural gas liquids from producing regions to market areas.

This section examines the following factors to assess the current adequacy of the pipeline capacity:

- price differentials compared with firm service tolls for major transportation paths
- capacity utilization on pipelines; and
- the degree of apportionment on major oil pipelines.

The Board has generally taken the view that it is better to have some excess pipeline capacity than to have inadequate capacity. While there are costs associated with having excess capacity in terms of higher tolls for shippers, the costs associated with insufficient pipeline capacity are generally greater. When there is inadequate take-away capacity, natural gas or oil production is shut-in or shipped to less attractive markets, resulting in foregone revenues for producers, foregone royalty revenue for governments, higher commodity prices for downstream consumers, an inefficient allocation of supply and a negative signal to investors in the upstream sector. The assurance that adequate capacity is available to serve various market regions provides a strong incentive to invest in exploration and development.

Further, some excess capacity in the system provides flexibility in the market. For example, when gas demand and prices are high in California because of poor hydro-electric conditions, Canadian producers would like to move gas to that market. When cold weather strikes the U.S. Northeast and prices in that market increase, the existence of some spare capacity allows producers to swing supply to that market, meeting consumers' needs and helping prices to stabilize.

The importance of having adequate pipeline capacity in place is highlighted by the fact that the value of natural gas and oil transported in NEB-regulated pipelines far exceeds the cost of service on those pipelines (e.g., in 2004 the value of products transported was approximately $100 billion compared with $4.5 billion for the cost of providing transportation service).

2.1.1 Price Differentials and Firm Service Tolls

One measure of adequacy is based on the principle that, if adequate capacity exists, the price differential (or basis) between two points on a pipeline should be equal to or less than the cost of

transportation. As long as the price differential is less than the firm service toll plus fuel, the market is demonstrating that there is adequate pipeline capacity between the two pricing points. When there is inadequate pipeline capacity between two market points, the basis will exceed the cost of transportation. In a market with adequate capacity, sellers would generally redirect their product to the higher price market, thereby meeting that region's need for energy. Where inadequate capacity exists, the product cannot get to market and the price differential persists, resulting in higher prices for consumers and lost revenues for producers.

In order to use this measure, there must be reasonably good pricing data available. Two examples of price differentials compared with firm service tolls are provided below; one for transportation on TransCanada PipeLines Limited (TransCanada or TCPL) and one for transportation on Westcoast Energy Inc. (Westcoast).

Figure 2 shows the basis between the Alberta border and the Dawn delivery point compared with the TransCanada firm service toll between the two points, including fuel costs. The fact that the basis is consistently lower than the firm service toll demonstrates that there generally has been excess capacity available on TransCanada since at least January 2001, although it appears that capacity between these two points has firmed up during the summer months since July 2002.

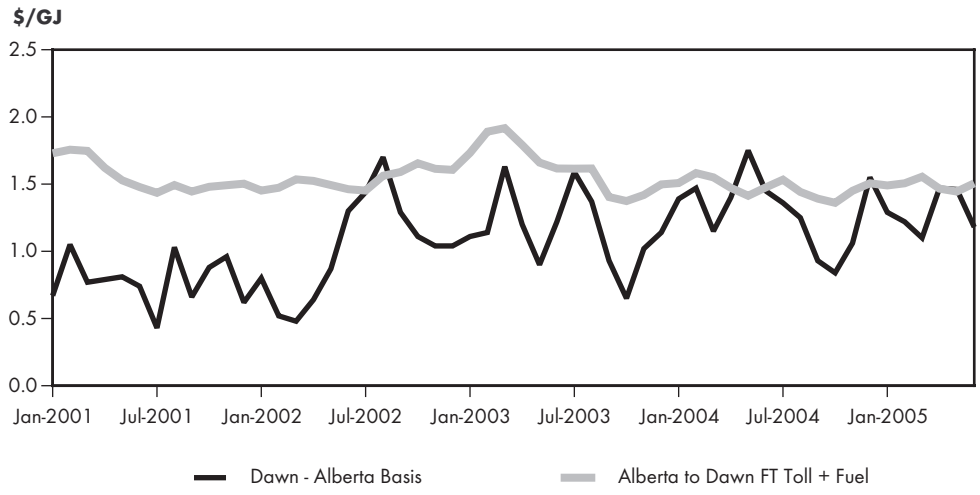
Figure 3 shows the basis between Compressor Station 2 on the Westcoast system and the Sumas export point compared with the Westcoast firm service toll between the two points (T-South or Southern Mainline), including fuel costs. Except for a few months, the basis has been lower than the transportation costs since February 2001, which indicates that there has been adequate capacity in place since that time[1].

Dawn-Parkway Corridor

Although there is inadequate pricing data available, there is evidence that capacity is tight on the Dawn-Parkway corridor of the Union Gas system. After the close of a binding open season in December 2004, Union signed contracts with 22 parties for an expansion of its system between Dawn and Parkway. Following the consideration of Union's facilities application, the Ontario Energy Board

FIGURE 2

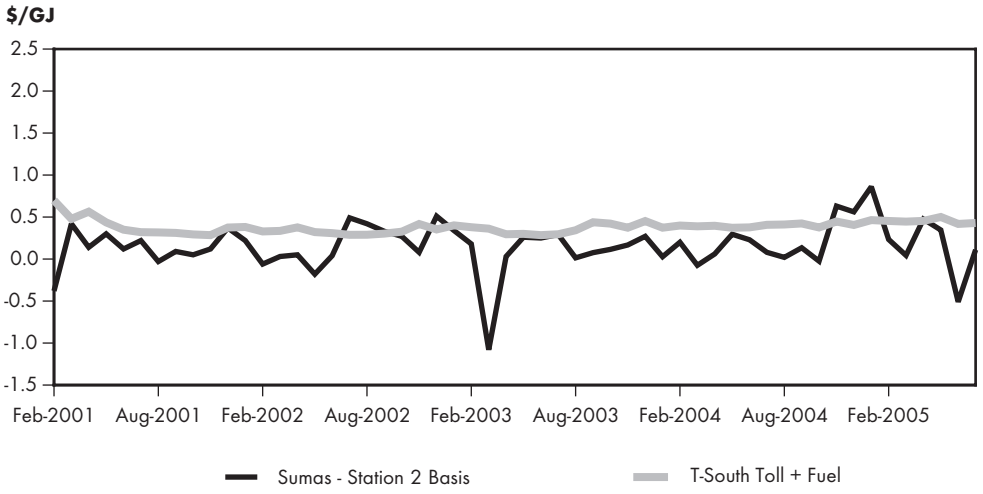
Dawn - Alberta Basis vs. TransCanada Toll and Fuel



1 The negative price differential at March 2003 may be a data anomaly.

FIGURE 3

Sumas - Station 2 Basis vs. Westcoast T-South Toll and Fuel



approved the expansion which is expected to be in service by November 2006. While not regulated by the NEB, this corridor is a key link between the Dawn hub and markets in eastern Canada and the U.S. Northeast.

2.1.2 Capacity Utilization on Major Routes

Where good pricing data is not available at major injection and delivery points on a pipeline system, another measure of adequate capacity is to monitor pipeline throughput compared with capacity. Capacity utilization is monitored for most large pipelines regulated by the Board.

The following figures show pipeline average monthly throughput compared with capacity on some of the largest pipeline systems regulated by the NEB, including TransCanada, Westcoast, Alliance Pipeline Ltd. (Alliance), Enbridge Pipelines Inc. (Enbridge), Terasen Pipelines (Trans Mountain) Inc. (Terasen (TMPL)) and Express Pipeline Limited Partnership (Express).

The volumes shown on Figure 4 are average monthly throughput[2] on the TransCanada Mainline and are approximately equal to the amount of gas flowing east on the Mainline from Saskatchewan. These volumes are compared with the design capacity of TransCanada's prairie line. Figure 4 shows that since April 2003, the prairie line has been operating at between 70 to 80 percent of capacity.

Figure 5 shows the average monthly throughput on Westcoast's Southern Mainline compared with capacity between Station 2 and the Sumas export point. This figure shows the seasonal nature of throughput on the Southern Mainline with more volumes being transported during the peak winter months and less volumes being transported during the summer months.

In Figure 6, throughput on Alliance's system is compared with the firm service contracted capacity of 37,534 $10^3m^3/d$ (1,325 MMcfd) and physical capacity, which has been calculated as the sum of the contracted capacity and capacity made available for Authorized Overrun Service (AOS). As shown, Alliance's capacity has been virtually 100 percent utilized since the commencement of its operations because of the high contract level and the offering of AOS, priced at only the cost of fuel, which has filled any additional capacity.

2 Daily fluctuations in throughput are not shown on the figure.

FIGURE 4

TransCanada Mainline Throughput vs. Capacity

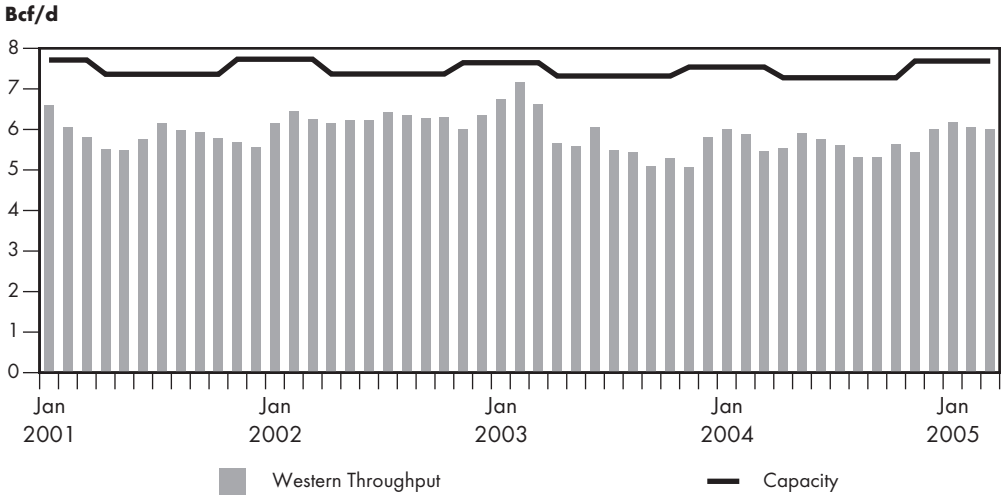
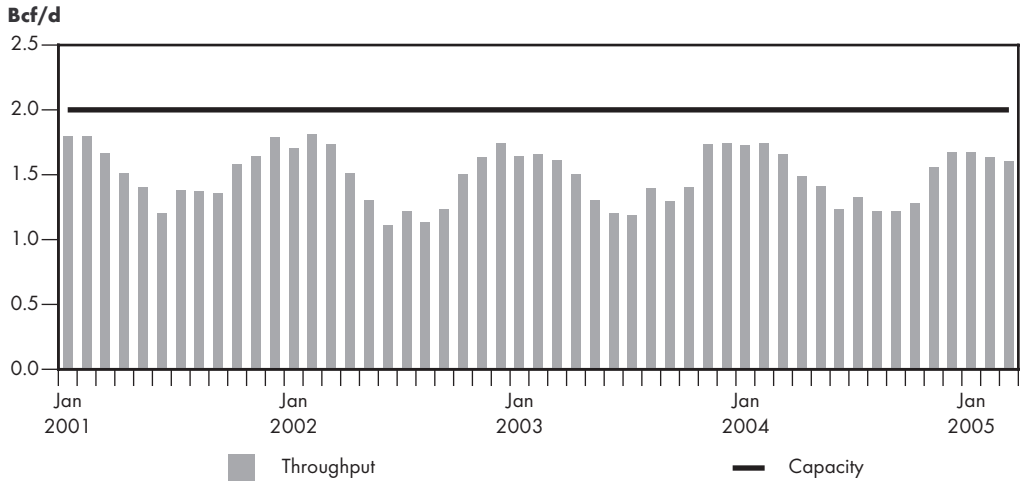


FIGURE 5

Westcoast Mainline Throughput vs. Capacity



It is somewhat difficult to assess utilization of the Enbridge system because it consists of several lines, most of which are dedicated to carrying specific grades of crude oil or natural gas liquids. As shown in Figure 7, since January 2001 Enbridge's mainline has been operating, on an overall average, at levels as low as 68 percent of capacity and as high as 86 percent of capacity. In the first quarter of 2005, Enbridge's mainline was operating at around 74 percent of capacity. Certain lines, particularly Lines 4 and 9 have been operating at or close to full capacity, with some apportionment (see section 2.1.3).

Terasen (TMPL) was operating at near capacity in 2003-04, with apportionment in January and March 2004. Given the high utilization rate, expected rising demand for pipeline space related to expected production growth in the oil sands, and increased shipments of heavy crude oil, Terasen (TMPL) applied in December 2003 for a 4 300 m^3/d expansion. The Board approved this expansion and it went into service in September 2004. In the first quarter of 2005, Terasen (TMPL) operated at approximately 60 percent of capacity, mainly because of refinery turnarounds on the west coast (see Figure 8).

FIGURE 6

Alliance Throughput vs. Capacity

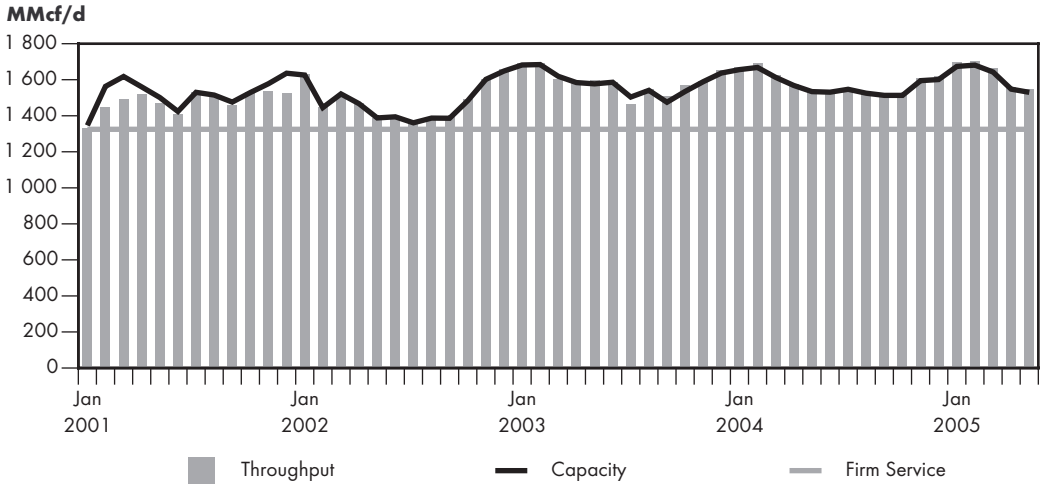
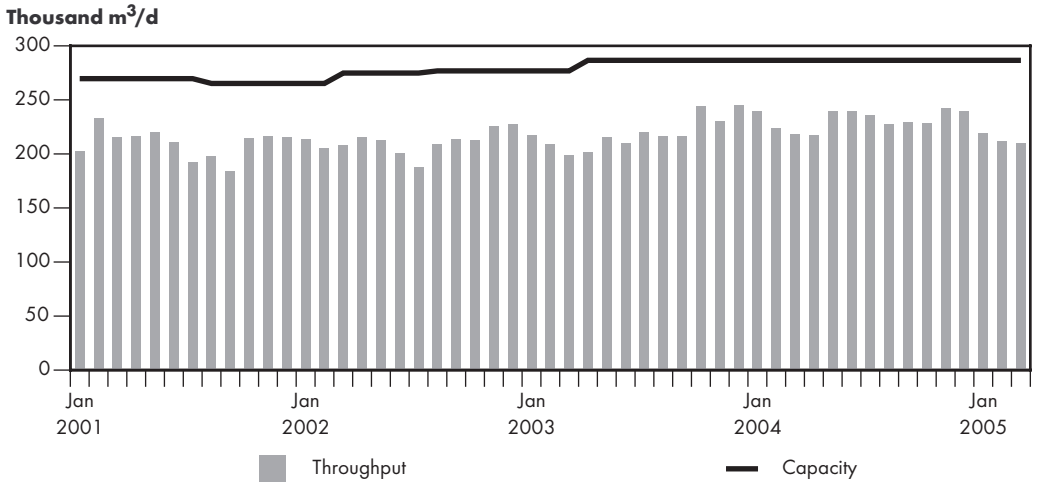


FIGURE 7

Enbridge Pipeline Throughput vs. Capacity



Express Pipeline Limited Partnership has been operating at full capacity for several years; at times exceeding 100 percent of its rated capacity (see Figure 9). On 1 April 2005, an expansion of 17 100 m^3/d was completed. Unlike Enbridge or Terasen (TMPL), Express primarily operates with long-term financial commitments with its shippers. Given that shippers have financially committed to the system, they will tend to use their available space on Express before shipping on other systems.

2.1.3 Apportionment

Oil pipelines operate for the most part as common carriers. On common carriers, shippers nominate their desired volumes for delivery into the pipeline on a monthly basis and have no contractual rights to the pipeline's capacity. Lack of adequate pipeline capacity occurs when shippers nominate more oil or oil products for transport than the pipeline can carry that month. When this happens, each of the shippers that nominate volumes is allotted or "apportioned" a share of the available capacity based on the capacity allotment agreement for each pipeline. Some recent apportionment data for Enbridge, Terasen (TMPL) and Cochin Pipe Lines Ltd. (Cochin) are shown below.

FIGURE 8

Terasen (TMPL) Throughput vs. Capacity

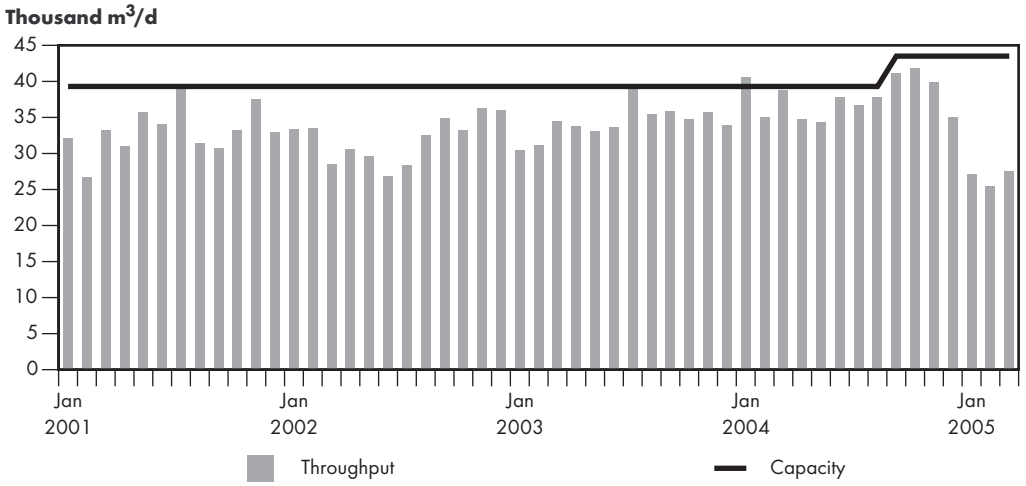
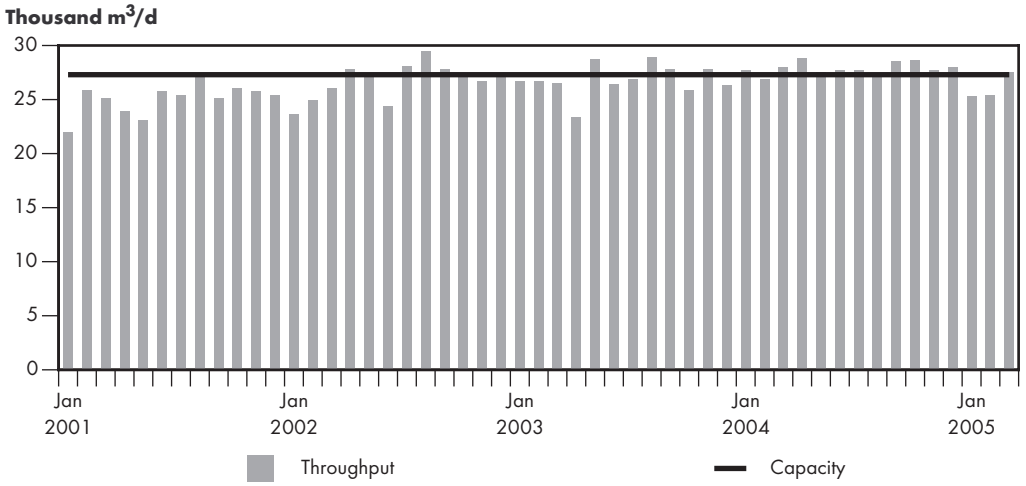


FIGURE 9

Express Throughput vs. Capacity



Enbridge

Enbridge's Line 2 and 4 are dedicated to the transportation of heavy crude oil, while Line 3 is dedicated to light and medium crude oils. In the first quarter of 2005, Line 4 was either marginally over subscribed or fully subscribed. In the third quarter of 2005, Enbridge is planning to switch service in Lines 2 and 3, thereby increasing heavy capacity by 39 000 m^3/d.

Enbridge's Line 9 has a capacity of 38 150 m^3/d and transports oil from Montreal to Sarnia. As shown in Table 1, apportionment has occurred fairly frequently on this line. One reason for this apportionment is increased shipments of crude oil produced from the Hibernia and Terra Nova fields which have high wax content and decreases operating capacity. Another reason is that foreign crude oil has been attractively priced and imports have been high in several months.

TABLE 1

Enbridge Apportionment

	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05
Line 4 Apportionment	0%	0%	0%	6%	0%	0%	1%	0%
Throughput ($10^3m^3/d$)	98.1	100.5	101.4	119.3	113	114.2	114.8	104.7
Line 9 Apportionment	21%	18%	0%	0%	4%	10%	0%	0%

TABLE 2

Terasen (TMPL) Apportionment

	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05
Apportionment	24%	14%	14%	0%	0%	0%	0%	13% L 62% D
Throughput ($10^3m^3/d$)	41.2	41.8	39.8	34.9	27.2	25.4	28.3	37.2

Terasen (TMPL)

On Terasen (TMPL), apportionment is calculated separately for volumes delivered to land-based and Westridge Dock destinations (shown as L and D respectively in Table 2). Apportionment in September through November 2004 was attributed to land-based nominations that were due to increased demand as well as maintenance on the system that reduced available capacity. Even with the capacity expansion that was completed in September 2004, there was apportionment in November due partly to greater demand by Washington State refiners. From December 2004 to March 2005, throughput fell and there was no apportionment for those months. The April 2005 apportionment of 13 percent for land-based volumes likely reflects increased nominations from the Washington refineries following plant turnarounds. The 62 percent apportionment for the Westridge Dock could reflect increased test shipments of heavier type crude oils.

As a result of periods of apportionment on Terasen (TMPL) since 2003, two applications have been filed with the Board. One is from Chevron Canada Limited (Chevron) for an order designating Chevron's refinery at Burnaby, B.C. as a priority destination for unapportioned delivery of crude oil from Edmonton. The second application was filed by Chevron Standard Limited, Neste Canada Inc. and Chevron for an order designating Chevron's refinery at Burnaby, B.C. as a priority destination for the unapportioned delivery of iso-octane from Edmonton.

Cochin

The capacity on Cochin is dependent on the type of product that is transported in the line and the time of year. Propane, ethane, ethylene and field-grade butane can all be transported on the line but the amount of ethylene nominated in a month affects the capacity. When there is a large amount of ethylene in the line, the capacity is reduced significantly. Cochin is still on pipeline restrictions since a rupture on the U.S. portion of the pipeline and a subsequent fire in 2003.

There was no apportionment in the first quarter of 2005, but pressure restrictions continue to limit capacity on Cochin. Apportionment is anticipated to occur between June and September 2005 due to a scheduled line shut-down for hydro-testing.

TABLE 3

Cochin Apportionment

	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05
Apportionment	32%	0%	0%	5%	0%	0%	5%	0%
Throughput (10^3m^3/d)	7.4	11.4	11.0	10.3	12.3	8.7	7.6	9.4

Wascana Pipeline

As operator of the Wascana Pipeline, PMC (Nova Scotia) Company received notice that the Bridger Pipeline would not be able to accept deliveries of crude oil from Wascana south of the first Bridger Pipeline pump station at Poplar, Montana because of integrity concerns. As a result of this constraint on the U.S. side, Wascana has been operating at greatly reduced rates. The Bridger Pipeline is currently investigating and repairing a large number of anomalies that were identified on its system. While it is still too early to determine with any certainty when the Bridger Pipeline will return to normal operation, the company's target is the end of August 2005.

2.2 Index of Pipeline Tolls

Another indicator of the efficiency of the transportation system is whether pipeline companies are providing services that meet the needs of shippers at stable and reasonable prices. The Board assesses this by analyzing the change over time in a benchmark toll for each major pipeline (e.g., TransCanada's Eastern Zone toll or Westcoast's T-South export toll). Given the nature of cost of service regulation, pipeline tolls may increase simply because a major capital project was undertaken to meet shippers' needs. Nonetheless, if a benchmark toll increases sharply, it could indicate an issue in transportation markets (e.g., falling throughput or contract demand).

Gas Pipelines

Figure 10 compares the tolls for TransCanada, Westcoast and Foothills Pipe Lines Ltd. (Foothills) with the Implicit Price Index (IPI), Non-residential structures[3], normalized to the year 1997.

The increase in TransCanada's Eastern Zone toll between 1997 and 2001 is mainly attributed to the large amount of decontracting on the Mainline during that period, particularly after the startup of the Alliance pipeline in 2000. The toll has been tracking the IPI fairly closely since 2001.

In 2000, Westcoast's T-South export toll increased over 10 percent from the previous year primarily because of non-routine pipeline integrity costs. The export toll began moving more closely to the IPI in 2001.

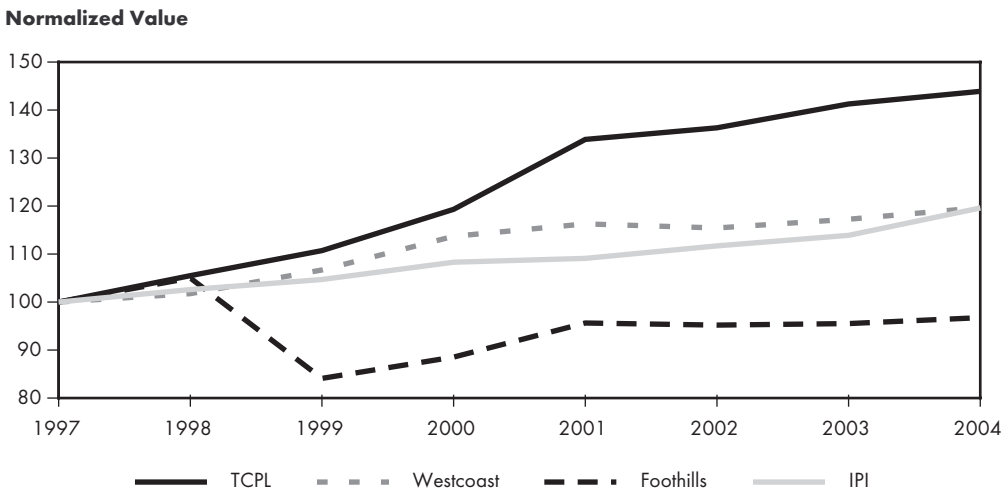
After declining in 1999 as a result of a cost-effective expansion of its system, Foothills' Zone 9 tolls have remained fairly stable. In addition, Maritimes & Northeast Pipeline's (M&NP) tolls have been relatively constant at around $0.66-68/GJ since it began operations in 2000 and Alliance's tolls have remained flat at $0.77/GJ since it began operations in 2001.

3 Statistics Canada suggested this index as being a suitable index for pipeline services.

Statistics Canada - CANSIM Series v3840577 - Table 384-0036: Implicit price indexes, Gross Domestic Product (GDP), PEA; Canada; Business gross fixed capital formation, non-residential structures (Index, 1997=100)

FIGURE 10

Gas Pipeline Tolls and the Implicit Price Index (Normalized to the Year 1997)



Oil Pipelines

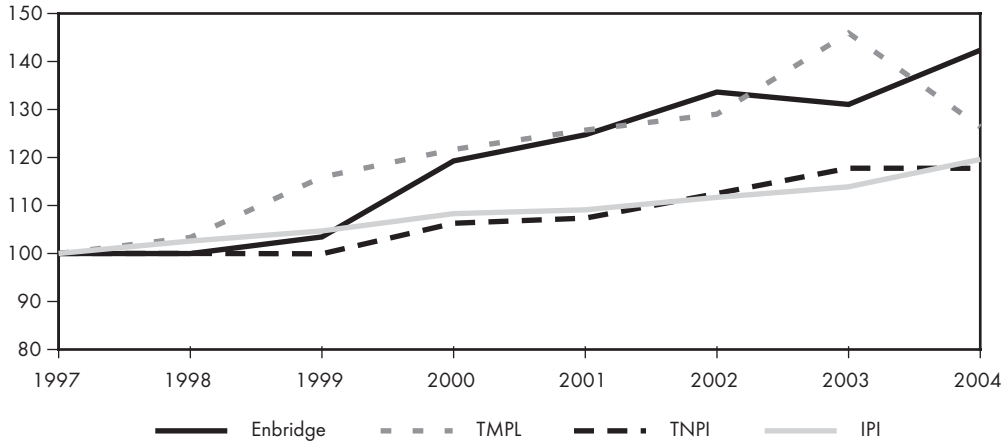
Figure 11 below shows benchmark tolls for Enbridge, Terasen (TMPL) and Trans-Northern Pipelines Inc. (TNPI) compared with the IPI, Non-residential structures, normalized to the year 1997.

In 2000, Enbridge's tolls (Edmonton to International border) increased because throughput levels were unexpectedly low in 1999. Under its negotiated settlement, Enbridge was able to recapture the shortfall in the ensuing years. The increase in 2004 tolls was mainly because Enbridge was operating at approximately 80 percent capacity utilization, as throughput has not filled recent capacity expansions. The full fixed costs are spread across lower volumes, resulting in higher tolls.

In 1999, Terasen (TMPL)'s tolls (Edmonton to Burnaby) increased because of low forecasted throughput (the 1999 forecast was 17.9 percent lower than the 1998 forecast and the toll is calculated based on forecast throughput). In 2004, Terasen (TMPL)'s tolls decreased, mainly because of the

FIGURE 11

Oil Pipeline Tolls and the Implicit Price Index (Normalized to the Year 1997)



disposition of 2003 deferrals for higher revenue and lower costs and slightly higher throughput starting in October 2004.

TNPI's tolls (Oakville to Montreal) have generally moved in tandem with the IPI since 1997.

2.3 Shipper Satisfaction

Shipper satisfaction is also another key measure of the efficiency of the transportation system. The Board uses the following tools to measure shipper satisfaction with the services they receive from pipeline companies:

- an annual survey;
- feedback through informal discussions with shippers and other stakeholders; and
- formal complaints filed with the Board.

2.3.1 NEB Pipeline Services Survey

In June 2004, the Board established an annual Pipeline Services Survey to obtain direct feedback from the shippers of ten major NEB-regulated pipeline companies on the level of service provided by those companies. The survey was also used to obtain feedback on the Board's performance in implementing its regulatory role with respect to tolls and tariffs.

In January 2005, the first Pipeline Services Survey was administered. Companies sent the survey to each of their active shippers, who then returned their responses directly to the Board. The overall response rate to the survey was 23 percent.

After analyzing the survey responses, the Board published a summary of the results in aggregate. The aggregate results include the industry average and distribution of responses for each question and a summary of any major themes or trends. In addition, the Board provided each pipeline and those shippers that participated in the survey with detailed company-specific results. Those results included the pipeline company's average rating and distribution of responses for each question and the verbatim comments received from shippers, with the source of those comments removed.

Figure 12 shows the aggregate results for the first survey question, which asked shippers to rate the overall quality of service provided over the last year (1 indicates "very dissatisfied" and 5 indicates "very satisfied"). The figure shows that shippers, on average, are reasonably satisfied with the services provided by pipeline companies[4].

The survey results indicated that shippers believe the pipeline companies are doing well in the following areas:

- physical reliability of operations;
- timeliness and accuracy of invoices and statements; and
- timeliness and usefulness of operations information.

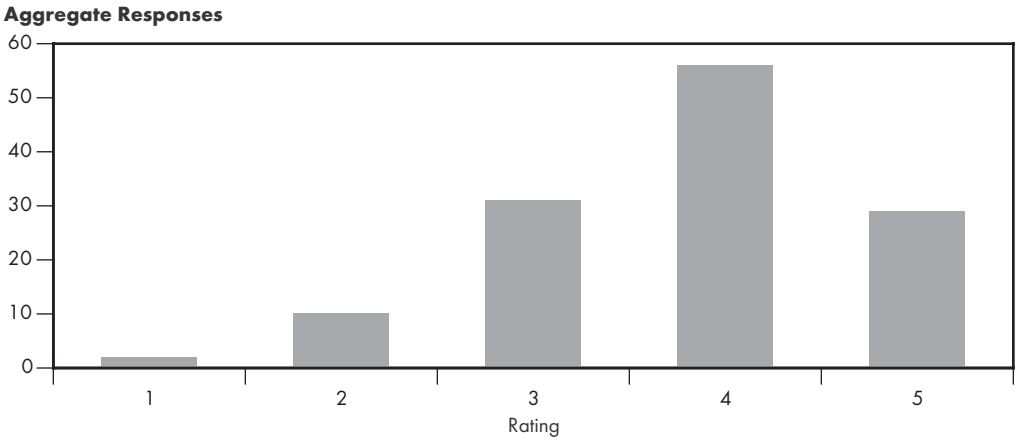
The areas where shippers believe that pipeline companies could improve the most are:

- make tolls more competitive;

4 The industry average is the average of all responses across all pipelines.

FIGURE 12

Overall Quality of Service (Industry Average, 3.78)



- exhibit an attitude of continuous improvement and innovation; and
- work towards fair and reasonable solutions when resolving issues.

Appendix 2 provides the aggregate scores on all survey questions. For the complete report on the aggregate results, go to www.neb-one.gc.ca/Publications/ and look under Survey Results.

2.3.2 *Informal Monitoring*

Informal monitoring involves face-to-face discussions between NEB staff and pipeline companies, shippers, provincial regulators and other stakeholders, such as members of the investment community. It enables NEB staff to seek views on industry issues and concerns, including pipeline performance and perceptions about regulatory processes. These discussions also provide the Board with an opportunity to gauge the efficiency of transportation systems and can provide an early signal of the need for leadership in some areas of economic regulation[5].

Some examples of comments received from stakeholders during informal monitoring meetings included:

- Where possible, tolls should be set for multiple years (e.g., three to five years) at a time. This practice would provide cost savings, more toll certainty and avoid re-examining the same material over and over. Some shippers stated that an NEB policy statement would encourage this outcome (similar to what the Federal Energy Regulatory Commission does with its *Notice of Proposed Rulemakings*). This suggestion was supported by a number of members of the investment community.
- A mechanism is needed for the Board to hear shipper concerns on a regular basis. With negotiated settlements, shippers feel that the Board gets little information on their concerns.

5 The Board is, of course, bound by its Code of conduct not to discuss any matter with outside parties that is currently a matter before the Board in a regulatory proceeding. See the Board's Web site for a copy of the Code of conduct.

2.3.3 *Formal Complaints*

The number and nature of formal shipper complaints to the Board is another indicator of how satisfied shippers are with pipeline services. A sizeable number of complaints could indicate that a problem needs to be addressed. There have only been a few complaints filed in the last two years that have required a formal process before the Board.

2.4 Pipeline Financial Viability and Ability to Raise Capital

The final measure of the efficiency of the transportation system is the financial strength of the pipeline companies. This section looks at the financial viability of several NEB-regulated pipeline companies and their ability to raise capital on reasonable terms and conditions to invest in infrastructure. To undertake this assessment, the following factors are examined: financial ratios, credit rating reports and equity analyst assessments.

As noted in the Introduction, it is not the intention of this report to assess factors that would be examined in a regulatory proceeding on cost of capital such as the comparable earnings standard or the capital attraction standard. Rather, the purpose of this report is to provide a broad assessment as to whether the Canadian transportation system is working and one factor in that regard is whether it is able to efficiently expand to meet the needs of producers and end-use customers.

2.4.1 *Financial Ratios*

Financial ratios are useful indicators of a company's performance and financial situation. They can be used to evaluate a company's liquidity, operating performance, growth potential and risk. Evaluating financial ratios is most meaningful when the ratios for a particular company are tracked over time or compared with industry benchmarks. Care must always be exercised in collecting and interpreting financial ratios for pipeline companies given that some financial information pertains to their larger parent companies which may include non-regulated assets.

Some key ratios used to assess the financial viability of pipeline companies include interest coverage ratios, funds from operations to total debt, return on equity (ROE) and total debt to equity. A few of these ratios are discussed below.

Interest Coverage Ratios

Interest coverage ratios measure how many times interest payments could be made with a company's earnings before interest expenses and income taxes are paid. From a bondholder's perspective, interest coverage is an indicator of whether a company could have problems making its interest payments. From an equity holder's perspective, this ratio helps to give some indication of the short-term financial viability of the company.

One formula used to determine the coverage of interest is Earnings Before Interest and Taxes (EBIT) divided by Annual Interest Expense. Another coverage ratio that focuses on cash flows rather than accounting income is funds from operations (FFO) interest coverage. FFO interest coverage data are not included in this report.

A higher coverage ratio is typically better for both bondholders and equity investors. From a bondholder's perspective, a high coverage ratio indicates a low probability that the firm will fail to

meet its interest obligations in the near term. For stock investors, a high ratio indicates that a company is relatively solvent.

Table 4 shows the EBIT interest coverage ratios for Group 1 pipeline companies as calculated by the Dominion Bond Rating Service (DBRS). Most interest coverage ratios are in the 2-3 times range, except for Terasen (TMPL) which has a coverage ratio many times higher than its peers. The reason for this higher ratio is primarily because of Terasen (TMPL)'s common equity ratio of 45 percent, which means it carries less debt. Table 4 also shows that the coverage ratios for most companies are stable or improving over time.

DBRS notes that interest coverage ratios for Canadian pipelines are often lower by 1.0 to 1.25 times than those for U.S. pipelines. It cites the following factors as contributing to these lower coverage ratios:

- lower allowed returns on equity (typically 200 basis points);
- lower allowed deemed common equity ratios of 30 percent to 35 percent in Canada; and
- flow-through tax accounting in Canada versus the normalized method in the U.S. (which allows for the recovery of deferred income taxes in tolls).

Despite the lower coverage ratios as noted by DBRS, none of the major NEB-regulated companies has had a problem servicing their debt obligations.

Return on Equity

Return on Equity (ROE) is a common measure of financial performance and is frequently used when evaluating and comparing companies. The ROE a company earns can be expressed financially as net income divided by common equity. However, for NEB-regulated pipeline companies, this ratio is expressed as the return on the equity portion of the rate base that is approved by the Board.

Table 5 shows the actual ROE for several Group 1 pipeline companies from 1999 to 2004 along with the NEB-approved ROE in accordance with the RH-2-94 Formula[6]. Alliance, Enbridge, M&NP and Terasen (TMPL) are not subject to the NEB-approved ROE as they all have negotiated a different

TABLE 4

EBIT Interest Coverage Ratios

	2000	2001	2002	2003
Alliance	-	1.85	1.92	1.85
Enbridge	2.80	2.84	3.02	-
Foothills	2.16	2.16	2.39	2.41
M&NP	1.55	1.82	2.05	-
Terasen (TMPL)	3.62	4.69	6.12	7.03
TQM	1.99	2.15	2.36	2.36
TransCanada	1.97	2.16	2.32	2.36
Westcoast	1.58	1.99	2.14	1.85

6 Formula used to determine the rate of return on common equity for certain NEB-regulated pipelines, established in the RH-2-94 Proceeding, as amended to eliminate rounding.

TABLE 5

Return on Equity for the Period 1999 to 2004

	1999	2000	2001	2002	2003	2004
Alliance	-	11.21	11.25	11.25	11.25	-
Enbridge	11.70	11.20	12.20	13.00	-	-
Foothills	9.58	9.90	9.61	9.53	9.79	9.56
M&NP	-	13.80	14.20	12.95	12.31	13.75
Terasen (TMPL)	18.50	17.50	19.60	20.40	20.40	-
TQM	9.94	9.96	10.21	9.80	10.21	9.84
TransCanada	9.64	9.99	9.72	9.95	10.18	10.18
TCPL B.C. System	9.58	9.90	6.86	9.53	8.21	8.51
Westcoast Field Services	-	-	13.62	14.87	6.76	11.63
Westcoast Transmission	11.68	12.68	15.84	13.44	12.93	10.28
NEB RH-2-94 Formula	9.58	9.90	9.61	9.53	9.79	9.56

Source: DBRS (Enbridge, Terasen); NEB Surveillance and Annual Reports (all others); dash indicates not available

ROE with their shippers[7]. Also, Westcoast's Field Services Division is not subject to the formula as its tolls for gathering and processing services are negotiated individually with shippers.

The ROE numbers for Enbridge and Terasen (TMPL) have been taken from their DBRS Credit Rating reports as those companies currently do not file NEB surveillance reports. As such, the numbers are somewhat higher than one would normally expect and might include some non-regulated income in the calculations (e.g., Terasen (TMPL)'s income includes $6 to $7 million annually of dividend income from its parent, Terasen Inc.). The complete details of these credit rating reports should be read before comparing the ROE for Enbridge and Terasen to the other companies listed in Table 5.

2.4.2 Credit Ratings

In Canada, credit ratings are determined by three independent credit rating agencies, DBRS, Moody's and Standard & Poor's (S&P). See Appendix 1 for a comparison of the rating scales for DBRS and S&P. Credit ratings, like stock prices, generally reflect the consolidated operations of the entire company and not solely the regulated portion. Thus, the use of credit ratings as an accurate measure of the performance for a regulated pipeline owned by a company that has both regulated and non-regulated operations, such as TransCanada and Enbridge, has to be interpreted with some care. In addition, credit ratings are somewhat subjective in that the rating imposed on a company is the expert opinion of an investment analyst, which may result in different ratings by different firms.

DBRS

In assigning a credit rating to a particular company, DBRS attempts to consider all meaningful factors that could impact the risk of maintaining timely payments of interest and principal in the future. While the key considerations will vary industry by industry, some of the common factors that are considered for most ratings are: core profitability; asset quality; strategy and management strength; and financial and business risk profile.

7 Negotiated ROE for Alliance is 11.25 percent and for M&NP is 13.0 percent.

For pipelines, electric and gas utilities, the following factors are also important considerations in deriving the credit ratings: regulatory factors, competitive environment, supply and demand considerations, and regulated vs. non-regulated activities.

The credit ratings for the Group 1 pipeline companies shown in Table 6 indicate that the ratings have remained stable from 1999 to the present. Alliance has improved from BBB(high) to A(low).

Standard & Poor's

An S&P credit rating is a current opinion of a company's overall financial capacity to pay its financial obligations. S&P bases its ratings on the overall creditworthiness of the corporation. Therefore, the rating of a wholly-owned subsidiary company, in the absence of meaningful ring-fencing measures, generally reflects the creditworthiness of the parent. This opinion focuses on the company's capacity and willingness to meet its financial commitments as they come due and may also apply to specific financial obligations. The rating histories for several Group 1 pipeline companies are provided in Table 7.

In S&P's rating methodology, a company rated 'A' has strong capacity to meet its financial commitments but is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than companies in higher-rated categories. A company rated 'BBB' has adequate capacity to meet its financial commitments. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the company to meet its financial commitments.

TABLE 6

DBRS Credit Rating History – Senior and Subordinated Debt

	1999	2000	2001	2002	Current
Alliance	BBB(high)	BBB(high)	A(low)	A(low)	A(low)
Enbridge	A(high)	A(high)	A(high)	A(high)	A(high)
M&NP	A	A	A	A	A
Terasen (TMPL)	A(low)	A(low)	A(low)	A(low)	A(low)
TQM	A(low)	A(low)	A(low)	A(low)	A(low)
TransCanada	A	A	A	A	A
Westcoast	A(low)	A(low)	A(low)	A(low)	A(low)

TABLE 7

S&P Credit Rating History

	2000	2001	2002	2003	2004
Enbridge	A/Stable	A-/Negative	A-/Negative	A-/Stable	A-/Stable
Terasen (TMPL)	BBB+/Stable	BBB+/Stable	BBB+/Watch Neg	BBB/Stable	BBB/Stable
TQM	BBB+/Stable	BBB+/Stable	BBB+/Stable	BBB+/Stable	BBB+/Stable
TransCanada	A-/Stable	A-/Stable	A-/ Watch Neg	A-/Negative	A-/Negative
Westcoast	A-/Negative	A-/Stable	A/Negative	BBB/Stable	BBB/Positive

Each of these agencies has expressed an opinion at various times that the ROE awarded through the RH-2-94 Formula and the deemed equity ratios awarded by the Board are low by international standards. Nonetheless, the ratings assigned by the credit rating agencies indicate that NEB-regulated companies are all within investment grade.

2.4.3 *Access to Capital Markets*

As mentioned in the Introduction, pipeline companies must be able to access capital to expand and maintain their systems to adequately meet the evolving needs of the marketplace.

The most straightforward test of a pipeline company's ability to finance new capacity is market evidence of their ability or inability to finance major new construction. However, there has not been much pipeline construction in the last few years because natural gas production from the Western Canada Sedimentary Basin (WCSB) has hit a plateau and adequate pipeline capacity is in place. While there has been some recent expansion of oil pipeline capacity, no really large investments have been made. Thus, the question to ask is whether or not pipeline companies would have any difficulty in financing new projects when they arise.

To answer this question, the Board met with credit rating agencies, suppliers of capital and equity analysts in the investment community to discuss their views on the ability of Canadian pipelines to access capital markets, their general criteria for assessing NEB-regulated pipelines, and their views on the current regulatory environment in Canada.

On the primary question of access to capital, all of the organizations consulted indicated that Canadian pipelines should have no difficulty raising capital at reasonable cost at this time. For example, they believed that there should be no major challenges in financing a pipeline such as the Mackenzie Valley natural gas pipeline or additional oil pipelines to carry growing production from the oil sands. It was noted by some that debt issues for Canadian pipelines have traditionally been very attractive, in part because of the secure regulatory environment. The organizations consulted were generally of the view that a debt issue would be favourably received by the market.

With respect to attracting equity, some investment analysts noted that a major equity issue at the current ROE awarded by the NEB could be more problematic. They noted that recent projects, such as Alliance and M&NP, have been based on a higher equity return. It was noted by some that incumbent pipelines are at a disadvantage if they have to raise capital at the existing ROE. Others were of the view that greenfield projects are riskier and simply require a higher ROE to attract the equity investment. It was recognized that the Board has approved the higher ROEs that have been necessary to support greenfield pipelines such as Alliance and M&NP.

2.4.4 *Other Comments by the Investment Community*

Credit rating agencies and pension funds are primarily concerned about the predictability of cash flows to support debt and dividend payments. In this regard, the Board's RH-2-94 Formula is viewed positively because it improves predictability. Most of the companies with whom the Board met stated that they would like to see arrangements that provide certainty over multi-year periods because annual toll hearings introduce uncertainty and can distract pipeline management from focusing on other important aspects of their business. They also would like to see tolls and tariffs in place at the start of a fiscal year because interim toll situations increase uncertainty.

Pension fund administrators expressed the view that the Board should 'protect' credit ratings because downgrades could be very costly to bondholders. They noted that Canadian bonds are an important revenue source for Canadian pension funds and that a downgrade could require them to sell a large percentage of their bonds at discounted prices. On the other hand, some groups were of the view that the Board should not be overly concerned about maintaining a 'target' credit rating for a pipeline; investment grade ratings should be adequate.

It was noted by some that the business environment for the traditional Canadian gas pipelines has become somewhat riskier since the construction of the Alliance pipeline and the slowdown in the growth of gas production. Accordingly, they believe that basic financial parameters in the Board's regulatory scheme should be improved[8]. Finally, a number of parties expressed concern that the Board does not have adequate rules to ensure financial protection ('ring-fencing') of a regulated utility and concern was expressed that cash could be drained from a pipeline company if its parent were to experience severe financial difficulties.

2.4.5 Assessments by Equity Analysts

Several equity analysts regularly publish their assessments of various companies for investors. The Board reviews these assessments for the consolidated operations of pipeline companies as they provide some useful information on their financial viability and outlook for the future. As with credit ratings, equity analysts generally focus on companies that have stand-alone share offerings and, in many cases, these offerings include non-regulated as well as regulated businesses. While observations vary from analyst to analyst and from company to company, most NEB-regulated pipelines have been rated in the 'hold' or 'buy' categories over the last year, indicating that this sector of the investment community does not have any significant concerns about their short-term prospects.

8 In its RH-2-2004 Phase II Reasons for Decision dated April 2005, the Board approved an increase in TransCanada's deemed common equity ratio from 33 percent to 36 percent.

Conclusions and Emerging Issues

Conclusions

Based on the chosen measures, the Board believes that the Canadian hydrocarbon transportation system is working very well at the present time.

Currently, **there appears to be adequate natural gas pipeline capacity in place on existing systems**, especially since production from the WCSB has levelled off over the last few years. The existence of some excess capacity out of the WCSB has provided producers with the flexibility to access their market of choice and the value of natural gas exports hit a record high of $26.5 billion in 2004. There are some constraints in the system east of Dawn, Ontario but this has not to date caused any prolonged problems in delivering adequate volumes to the marketplace to meet the needs of consumers.

Overall, there is adequate capacity on the oil pipeline transportation system and all types of oil produced in the WCSB are being delivered to markets within and outside Canada. However, capacity on some systems has been tight, notably on Terasen (TMPL). This has been illustrated by the need for Terasen (TMPL) to apportion shippers in recent months and by Chevron's request for priority destination status for its Burnaby refinery. Canadian oil producers also appear to believe that there is a need to improve access to heavy crude oil markets in the U.S. Inadequate access to refineries designed to run heavier crudes appears to have been a contributing factor to the recent high heavy/light price differentials for Canadian crudes. This need for improved access has been illustrated by the Canadian industry's support for the reversal of two U.S. pipelines to Cushing, Oklahoma and the U.S. Gulf Coast to allow growing oil sands production to penetrate new markets.

Based on the results from the NEB Pipeline Services Survey, **shippers are reasonably satisfied with the services provided by pipelines** (overall rating of 3.78 out of 5). In particular, physical reliability of pipeline operations was rated very highly by shippers, indicating that products are reliably delivered to markets. There are, however, a few areas where some work is required on the part of the pipeline companies to improve service, including:

- making tolls more competitive;
- exhibiting an attitude of continuous improvement and innovation; and
- working collaboratively towards fair and reasonable solutions to resolve issues.

The financial assessment indicates that **NEB-regulated pipeline companies are financially sound**. However, it is recognized that some of the data and indicators reviewed are for the consolidated operations of pipeline companies. While pipeline companies have not had to raise large amounts of capital in recent years, the Board's survey of the investment community revealed that it believes that

pipeline companies should have no difficulty in raising capital to finance most major new projects at this time.

The Board recognizes that this report is a snapshot in time and does not include a comparison, for example, with pipelines in other jurisdictions. The Board considers this report as a first step in assessing the effectiveness of the hydrocarbon transportation system in Canada. The Board will continue to monitor the effectiveness of the system and will continue to meet with parties to gain an understanding of all perspectives on the transportation system. The Board welcomes feedback at any time on the measures and conclusions in this report and welcomes suggestions for improvements to future reports.

Emerging Issues

While the transportation system is currently working well, there are a number of emerging challenges facing the industry.

To meet the needs of producers and users, the transportation system must be able to adapt to the changing needs of the market over time and expand to attach new sources of supply. This can be particularly challenging for the pipeline sector because investments tend to be "lumpy" and, given the long life of the assets, investors have to be reasonably assured of the existence of supply and markets over a long time period. Clearly, the longer the time period over which an investment is recovered, the greater the possibility that market circumstances will change.

The potential for market change over time is highlighted by the uncertainties around the number of liquefied natural gas (LNG) terminals that will be built in North America and the potential effects that imported LNG will have on the supply and demand balance and on the pattern of natural gas flows. For example, the construction of LNG terminals in Quebec could have important implications for the flow pattern on TransCanada and TQM and could impact the toll design of the system.

Another event that could impact the supply and demand balance and consequent gas flows is the significant potential gas requirement for power generation that will be driven by Ontario's policy to remove 7 500 MW of coal-fired capacity from its system. Although the refurbishment of existing nuclear generation might meet part of the requirement for the displaced coal, there will likely be a significant volume of new natural gas-fired generation to enter the system. The exact impact of this incremental generation on natural gas pipelines will depend on the total amount of generation awarded and the location.

On the oil side of the market, the expected growth in production from the oil sands is posing tough choices for the industry regarding which incremental markets to access and how to expand the pipeline system. Options include expansion of existing systems and construction of new systems to access new markets in either or both the U.S. and Asia. Given the large capital outlay and the relative irreversibility of the investment decision, market participants want to ensure that the optimal decisions will be made.

From a regulatory perspective, the challenge is to provide a fair and effective process that does not distort the investment decisions that should optimally be made in the marketplace. Investors in new pipelines desire clear regulatory processes with predictable timelines. New investment can be frustrated when timelines stretch out and unexpected regulatory hurdles materialize during the process. Unnecessary delays in construction of new systems that are in the public interest can result in increased costs to energy users as development of new supplies are constrained.

The flattening of natural gas production from the WCSB and construction of the Alliance pipeline has created challenges for a number of the older systems that are experiencing a sharp decline in the long-term contracts on their systems. Natural gas is still being moved on these systems, but many shippers prefer to rely on short-term services to maximize their flexibility. Under the traditional cost of service approach, the remaining firm shippers have to bear the load of recovering the fixed costs in the form of rising tolls. While the erosion of long-term contracts has not yet vitiated the cost of service framework, new toll design structures may need to be considered to effect a fair sharing of costs and to maintain the competitiveness of these systems.

Lastly, having regard to the financial viability of the pipeline companies, there is interest in the investment community and amongst shippers in working towards multi-year frameworks for the establishment of tolls on more pipeline systems. A multi-year framework would provide more certainty for all parties and reduce the burden associated with continual negotiations and regulatory proceedings. While the Board is committed to working towards a framework which reduces regulatory uncertainty, it recognizes that it may be difficult to structure a multi-year framework that will meet the needs of all parties when the market context is expected to change considerably in the next few years. The investment community would also like to see tighter regulatory rules regarding parent-affiliate dealings in order to protect the cash flows of the regulated entities.

Some of these issues will be settled amongst parties, others may be examined in formal proceedings before the Board, and others may be amenable to potential regulatory actions outside of the hearing process. The Board will continue to consult with stakeholders on these issues and seek input if and when any regulatory initiatives are pursued.

Debt Rating Comparison Chart

This chart provides a comparison of the rating scales used by DBRS and S&P when rating long-term debt.

Credit Quality	DBRS	S&P
Superior	AAA	AAA
	AA high	AA+
	AA	AA
	AA low	AA-
Good	A high	A+
	A	A
	A low	A-
Adequate	BBB high	BBB+
	BBB	BBB
	BBB low	BBB-
Speculative	BB high	BB+
	BB	BB
	BB low	BB-
Highly Speculative	B high	B+
	B	B
	B low	B-
	CCC	CCC
	CC	CC

Ratings in the Adequate category and above are considered Investment Grade.

Standard & Poor's also provides a Rating Outlook that assesses the potential direction of a long-term credit rating over the intermediate to longer term. A 'Positive' outlook means that a rating may be raised; a 'Negative' outlook means that a rating may be lowered; and a 'Stable' outlook means that a rating is not likely to change.

PIPELINE SERVICES SURVEY AGGREGATE RESULTS

The results below are the aggregate responses from shippers on several major NEB-regulated pipeline companies. See the Board's Web site for the complete details.

1. How satisfied are you with the OVERALL quality of service provided by the pipeline company over the last calendar year?

1	2	3	4	5	Average
2	10	31	56	29	3.78

2. What are the things that this pipeline company does well?
3. What are the things that this pipeline company could do better?
4. How satisfied are you with the physical reliability of the pipeline company's operations?

1	2	3	4	5	Average
2	9	12	53	52	4.13

5. How satisfied are you with the quality, flexibility and reliability of the pipeline company's transactional systems (nominations, bulletin boards, reporting, contracting, etc.)?

1	2	3	4	5	Average
5	9	32	51	27	3.69

6. How satisfied are you with the timeliness and accuracy of the pipeline company's invoices and statements?

1	2	3	4	5	Average
3	9	19	49	38	3.93

7. How satisfied are you with the timeliness and usefulness of *operations* information (outages, available capacity, scheduled maintenance, flows, etc.) provided by the pipeline company?

1	2	3	4	5	Average
5	9	24	61	26	3.75

8. How satisfied are you with the timeliness and usefulness of *commercial* information (tolls, service changes, new services, contract information, etc) provided by the pipeline company?

1	2	3	4	5	Average
1	11	34	65	16	3.66

9. How satisfied are you with the degree to which the pipeline company demonstrates an attitude of continuous improvement and innovation?

1	2	3	4	5	Average
8	21	46	38	11	3.19

10. How satisfied are you with the accessibility and responsiveness of the pipeline company to shipper issues and requests?

1	2	3	4	5	Average
6	19	28	51	18	3.46

11. How satisfied are you that the pipeline company works towards fair and reasonable solutions when resolving issues?

1	2	3	4	5	Average
6	24	32	42	12	3.26

12. How satisfied are you with the suite of service options (FT, IT, backhaul, etc.) offered by the pipeline company?

1	2	3	4	5	Average
3	6	33	47	15	3.63

13. How satisfied are you that this pipeline company's transportation tolls are competitive?

1	2	3	4	5	Average
9	14	55	39	4	3.12

14. How satisfied are you with the collaborative processes (negotiations or task force meetings) utilized by this pipeline company?

1	2	3	4	5	Average
6	8	47	45	7	3.35

15. How satisfied are you that the current negotiated settlement agreement or tariff arrangements work well to provide fair outcomes?

1	2	3	4	5	Average
7	9	43	49	9	3.38

16. How satisfied are you that the NEB has established an appropriate regulatory framework in which negotiated settlements for tolls and tariffs can be reached?

1	2	3	4	5	Average
5	7	35	51	16	3.58

17. When toll and tariff matters are not resolved through settlement, how satisfied are you with the Board's processes to resolve disputes?

1	2	3	4	5	Average
4	11	33	38	13	3.46

18. What could the Board be doing to improve its processes through which tolls and tariffs are determined?

19. Additional comments