

## RESEARCH REPORT AVAILABLE

The Canadian Energy research Institute (CERI) is pleased to announce the public availability of the full report of **Study No. 113: The Capacity of the Western Canada Natural Gas Pipeline System**, with the release of **Volume 2: Capital Costs and Pipeline Tolls**.

### **ENSURING MARKET ACCESS:**

#### **The Capacity of Western Canada's Natural Gas Pipeline System**

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Volume 1 describes the Western Canada export pipelines, proposed pipelines from the Arctic, research methodology, four scenarios used in the study, key assumptions, and conclusions. Volume 2 details the capital costs and pipeline tolls associated with the system. The Summary Report for each volume provides a detailed overview. The following is a brief synopsis.

Natural gas production in western Canada keeps going at near-record levels, despite operating at times like a rapidly quickening treadmill. And there's plenty more to come down the pipe—from Canada's Mackenzie-Beaufort basins, Alaska's North Slope, and Canada's High Arctic. The natural gas is pipelined to consumers in Western and Eastern Canada, the US Mid-Continent, New England, and Mid-Atlantic States, and California and the Pacific Northwest.

**System capacity** - Five export pipelines connect the WCSB producing region with these demand locations. Together they have a total average annual daily export capacity leaving Alberta and BC of 14,980 MMcfpd (2005): the Duke Gas Pipeline (formerly the Westcoast system) at 1,100 MMcfpd; Gas Transmission Northwest at 2,770; Foothills/Northern Border at 2,180; Alliance at 1,630; and the TransCanada pipeline system at 7,210 MMcfpd.

The capacity of the TCPL eastern mainline will be reduced to 6,695 MMcfpd in 2009, when one of the gas pipelines is converted to oil service for the Keystone pipeline system. The TCPL East system currently has US market connections via of a number of pipelines—Great Lakes, Viking Gas Transmission, Iroquois, and Portland Natural Gas Transmission via TQ&M—as well as interconnections at Sarnia, Ontario, Niagara Falls, Ontario and other smaller nodes.

**Pipeline contracts** - The Alliance pipeline is operating under the primary term contract obligations that extend to 2015, with a provision that shippers may extend the service for a minimum of one year at a time by giving written notice five years in advance. The Northern Border pipeline contract expired in 2006, and it is currently operating under a combination of short-term firm service and interruptible contracts. The Gas Transmission Northwest, Westcoast Energy, and TransCanada pipelines are all operating under a combination of firm and interruptible contracts.

**Supply and system utilization** - The average utilization of these pipelines in 2005 was 83 percent. Gas Transmission Northwest had the lowest at 64 percent, and the Alliance pipeline the highest at 98 percent (including Authorized Overrun Service).

The EUB, CERI and the NEB all forecast a significant increase in the usage of natural gas in the Alberta Oil Sands sector that, coupled with a decline in production of conventional gas, will result in reduced deliveries to Alberta export pipelines (excluding the Alliance pipeline).

Coal Bed Methane development has increased over the past several years, and is forecast to continue an upward trend. LNG imports at Kitimat, BC (2009), and new gas deliveries via a Mackenzie Valley pipeline (2012), would also add to the supply availability. However, this is unlikely to be enough to reverse the declining trend. The current forecasts are for the average utilization of the export pipelines to decline from 83 percent currently to 74 percent in 2012 and 58 percent in 2018. This means that the unused take-away capacity would increase from its current level of 2,500 MMcfpd to 3,500 MMcfpd by 2012 and 6,900 MMcfpd by 2018.

**System developments** - TransCanada has proposed a 1,250 MMcfpd pipeline from northwest to northeast Alberta (the North Central Corridor). This would not contribute to Alberta export capacity, but does offer operational flexibility for intra-Alberta deliveries, negating the need to back-haul gas from the mainline to the Fort McMurray area.

The Mackenzie Valley pipeline, as it is currently proposed, will cost C\$7.8 billion (2006 dollars, as in rest of text) for the pipeline connection from the Inuvik gas processing plant to the NWT/Alberta border. The average transportation tariff will be \$2.42 per Mcf—\$2.28 as a reservation charge plus \$0.16 as a fuel usage charge.

The Alaska Highway pipeline is estimated to cost C\$14.5 billion for the Alaska section and C\$16.4 billion for the Yukon/BC section. The combined average transportation tariff for the gas pipeline from Prudhoe Bay, AK to Boundary Lake, AB will be \$2.69 per Mcf—\$2.50 as a reservation charge plus \$0.19 as a fuel usage charge. The capacity design of the pipeline will be 4,500 MMcfpd delivered to Boundary Lake, AB.

**Transportation costs** - Transporting Alaska gas to Chicago by the Alliance pipeline system would require an additional C\$2.6 billion for the connector pipe from Boundary Lake to Fort Saskatchewan, and an additional C\$11.0 billion for incremental pipe and compression facilities on the Fort Saskatchewan to Aux Sable in Illinois. The combined average transportation tariff from Boundary Lake to Aux Sable will be \$1.61 per Mcf—\$1.27 as a reservation charge plus \$0.34 as a fuel usage charge.

Transporting Alaska gas to Chicago via the TCPL Alberta, Foothills/Northern Border and TCPL East pipelines would require C\$1.8 billion for additional pipe and compression facilities. These facilities are all required on the TCPL Alberta system; the export pipelines will have sufficient spare capacity to handle the additional volumes. The average transportation tariff for the TCPL Alberta/TCPL East and

the TCPL Alberta/Foothills Northern Border systems would be \$1.30 including the Alberta toll and fuel usage charge.

**Keeping a lid on project costs** - Comparing the size of the expansion projects required on the Alliance and TCPL systems, and understanding that construction would overlap the Alaska Highway activity, there is a strong potential for increased cost estimates and project cost overruns. It appears that expansion of the TCPL system would offer less of an impact on construction costs as a result of fewer facility requirements.

**Alaskan gas to markets** - Alaskan shippers would have access to multiple markets in the Pacific Northwest, California, eastern Canada, Chicago and the northeast United States. These would be accessed utilizing the existing infrastructure of the TCPL Alberta pipeline system, and connections with the Gas Transmission Northwest, Northern Border, TCPL East, Iroquois and others. It is difficult to quantify the value of access to multiple markets, but these connections would allow shippers to optimize flow direction, market deliveries, and, ultimately, product value.

Utilizing the spare capacity on the TCPL Alberta system and the associated export pipelines would not only mean significantly less contractual commitments from the Alaskan shippers, because of the minimal facility requirements, but would also offer the Alaskan shippers a 20¢-30¢ per Mcf toll saving compared with the Alliance expansion. This toll saving would also be realized by the existing shippers that transport gas from the WCSB to the eastern markets.



In this study CERI examined a broad series of scenarios using its proprietary models: CERI-PIPH for gas hydraulics; CERI-GASS for gas supply forecasting; and CERI-NPEM for equilibrium market price forecasting. The CERI research team—led by Peter Howard—believes *that “the performance of the pipeline system into and out of western Canada is critical to efficient operation of the North American natural gas marketplace”.*

Companies, government departments and regulatory agencies that understand the issues that CERI has examined and analyzed will be better equipped to take advantage of the business opportunities presented and facilitate operations. This Report is crucial to companies and organizations that want to see the big picture.

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