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ECONOMIC IMPACTS OF NATURAL GAS DEVELOPMENT WITHIN THE YUKON TERRITORY



Executive Summary

The Western Canadian Sedimentary Basin (WCSB) does not end at the 60th parallel, which demarcates the northern borders of Alberta and British Columbia. There is every reason, and increasing evidence, to believe that rich deposits of oil and gas extend into the Yukon Territory and the Northwest Territories as well. In the case of Yukon, there has been little exploration within the territory's eight oil and gas basins, so the available geological data is sparse. This study has two aims: to describe the conventional natural gas resource in Yukon and to consider the potential of conventional natural gas production and infrastructure development in the territory. Unconventional resources, such as shale gas,¹ are not considered in the report, nor are recent innovations in production, such as hydraulic fracturing. Data and economic analysis have been taken from a variety of sources, including the Canadian Energy Research Institute's (CERI) North American Natural Gas Pathways study,² CERI's proprietary economic models, findings published by the Government of Yukon, and consultants' reports.

Operating and capital expenditures have been calculated using CERI's US Canadian Multi-Regional I/O 3.0 model in order to estimate GDP, employment, and taxation over the period 2017-2041. For capital expenditures, CERI assumes the majority of spending will occur in the mature, oil- and gas-focused Alberta economy, with the much smaller Yukon economy receiving less. For operating expenditures, CERI assumes that most spending would occur in Yukon where the sites, facilities, and maintenance staff would be located. Specialized operational expertise would be sourced from Alberta. The injection assumptions are explained in detail in Chapter 4 of this report. We assume that all capital and operational spending outside of Yukon occurs in Alberta.

The GDP, employment, royalties, and taxation projections in this report should be considered as lower-bound economic impact estimates. They reflect a Yukon oil and gas sector that is presently in a nascent stage and has not yet developed robust economic linkages to other sectors in the territory or the other provinces and territories in Canada. In the future, assuming Yukon's oil and gas sector begins to grow and infrastructure is built, those linkages will materialize. The linkages will generate more oil and gas investment in Yukon's economy generally. Economic linkages with other provinces would expand also, with GDP, taxation, and employment all increasing at greater rates than today. In short, as the oil and gas industry and economy grow in Yukon, there will be more economic activity and jobs for the same amount of investment.

The report includes two gas industry development scenarios. Scenario 1 represents modest domestic development. Scenario 2 offers more significant development of Yukon's resources, whereby domestic needs are met and surplus gas is exported.

¹ Though there is likely potential for shale gas development in the Yukon, this report is limited to consideration of the conventional resource in the territory, which has been researched to a greater extent.

² CERI Study 138, "North American Natural Gas Pathways", June 2013. Available at http://ceri.ca/images/stories/2013-09-05_CERI_Study_No_138_-_North_American_Natural_Gas_Pathways.pdf

Consideration of natural gas development in Yukon will continue to take place within the broader context of global energy dynamics as explored in CERI's North American Natural Gas Pathways study. Notably, natural gas as a share of global energy consumption³ has grown by 32 percent over the past 40 years. Of the other two leading energy sources worldwide, coal grew by 11 percent while oil demand grew by 32 percent over the same period. In 1973, all fossil fuels accounted for 94 percent of global energy consumption; by 2013, the percentage had decreased, but fossil fuels still accounted for 87 percent of global energy consumption. Natural gas is an increasingly important energy source in a world economy that remains largely driven by hydrocarbons.

This report's findings include the following:

- Natural gas development is driven in part by increased demand from mining investment.
- Basin availability and land access must be addressed in advance of energy infrastructure development in Yukon.
- 36 percent of Yukon's sedimentary basins that are oil and/or gas prospective, representing 5.4 percent of the territory's land area, are available for development in 2014.
- A further 40 percent of hydrocarbon prospective areas in Yukon, representing 6 percent of the territory's land area, are temporarily unavailable but may be made available in the future.
- Eagle Plain basin is the most feasible area for development in 2014, with 73 percent of the land area available. The second most feasible area is Peel Plateau & Plain basin, with 36 percent of the land area available.⁴
- Liard basin in southeast Yukon is a promising third basin that could see development when more of its land becomes unencumbered and accessible.
- The analysis outlines economic benefits, including fiscal impacts, to Yukon and the rest of Canada associated with natural gas development.

Scenario 1

This scenario considers a domestic pipeline option from Eagle Plain basin to Stewart Crossing, with a lateral line to the Casino mine site (see Figure 4.1). This pipeline would be constructed and operated over the 2017-2041 timeline.

- Natural gas development capital and operating investment under Scenario 1 would equal C\$9,758⁵ million in all Canadian provinces.

³ Primary energy consumption grew from 5,710.29 MTOE in 1973 to 12,730.43 MTOE in 2013, according to the 2014 BP Statistical Review of World Energy. Within that period, natural gas consumption increased from 1,046.16 MTOE to 3,020.38 MTOE; coal consumption rose from 1,558.97 to 3,826.71 MTOE; and oil grew from 2,763.56 to 4,185 MTOE.

⁴ Since the development of this analysis, Yukon government has made public statements that indicate all of the Peel Plateau & Plain basin is likely to be 100% encumbered/unavailable while judicial action relating to the area is concluded. The analysis in this report does not account for this reduction in available oil and gas lands.

⁵ Unless otherwise stated, all currency amounts are in 2013 Canadian dollars.

- Scenario 1 could provide the territory with 50 MMcf/d of natural gas for 80 years, assuming no further exploration or development.
- Natural gas development under Scenario 1 would create a total of C\$10,506 million of GDP impact in Canada, with C\$875 million of that GDP impact in Yukon over the 2017-2041 timeline.
- Natural gas development under Scenario 1 would create and preserve a total of 62,000 person years of employment in Canada, with 6,000 person years of the employment created and preserved in Yukon over the 2017-2041 timeline.⁶
- Natural gas development under Scenario 1 would create total tax receipts of C\$2,077 million in Canada, with C\$101 million of those receipts in Yukon over the 2017-2041 timeline.
- Natural gas development under Scenario 1 would create royalty income for Yukon of \$452.9 million from \$3,870 million in sales gas value over the 2017-2041 timeline.

Scenario 2

Scenario 2 offers a domestic and export pipeline option to move natural gas from Peel Plateau & Plain basin and Eagle Plain basin to Stewart Crossing and then further south to the US border near Haines, Alaska; a lateral line would also be built between Stewart Crossing and the Casino mine site (see Figure 4.7). A generation and liquefaction facility at Stewart Crossing would provide on-grid supply and serve other off-grid mines. The export pipeline would feed a small LNG plant to be constructed in Haines. All pipelines and facilities would be built and operated over the 2017-2041 timeline.

- Under Scenario 2, estimated total capital and operating investment in all Canadian provinces from 2017-2041 would equal C\$27,653 million.
- Scenario 2 could provide the territory with 50 MMcf/d of natural gas and the Haines plant with 180 MMcf/d of natural gas for 24 years, assuming no further exploration or development.
- Natural gas development under Scenario 2 would create a total of C\$32,791 million in GDP impact in Canada, with C\$2,712 million of that GDP impact felt in Yukon over the 2017-2041 timeline.
- Natural gas development under Scenario 2 would create and preserve 191,000 person years of employment in Canada with 19,000 of the person years created and preserved in Yukon over the 2017-2041 timeline.
- Natural gas development under Scenario 2 would create tax receipts of C\$6,497 million, with C\$314 million of those receipts in Yukon over the 2017-2041 timeline.
- Natural gas development under Scenario 2 would create royalty income for Yukon of \$1,360 million from \$13,530 million in sales gas value over the 2017-2041 timeline.

⁶ Person years of employment does not equal total jobs. For example, 6,000 person years of employment could be 6,000 jobs for one year, 3,000 jobs for two years or 1,000 jobs for six years. Person years equals the number of jobs times the number of years each job will exist.