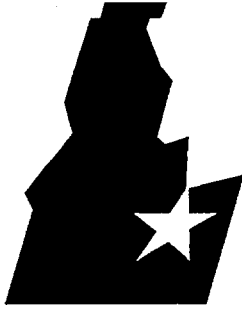


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A handwritten signature in black ink, appearing to be 'A. W.', is written over the Lockheed Martin logo.

Economics of Alaska North Slope Gas Utilization Options

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ECONOMICS OF ALASKA NORTH SLOPE GAS UTILIZATION OPTIONS

ABSTRACT

The recoverable natural gas available for sale in the developed and known undeveloped fields on the Alaskan North Slope (ANS) total about 26 trillion cubic feet (TCF), including 22 TCF in the Prudhoe Bay Unit (PBU) and 3 TCF in the undeveloped Point Thomson Unit (PTU). No significant commercial use has been made of this large natural gas resource because there are no facilities in place to transport this gas to current markets. To date the economics have not been favorable to support development of a gas transportation system. However, with the declining trend in ANS oil production, interest in development of this huge gas resource is rising, making it important for the U.S. Department of Energy, industry, and the State of Alaska to evaluate and assess the options for development of this vast gas resource.

The purpose of this study was to assess whether gas-to-liquids (GTL) conversion technology would be an economic alternative for the development and sale of the large, remote, and currently unmarketable ANS natural gas resource, and to compare the long term economic impact of a GTL conversion option to that of the more frequently discussed natural gas pipeline/liquefied natural gas (LNG) option. The major components of the study are: an assessment of the ANS oil and gas resources; an analysis of conversion and transportation options; a review of natural gas, LNG, and selected oil product markets; and an economic analysis of the LNG and GTL gas sales options based on publicly available input needed for assumptions of the economic variables. Uncertainties in assumptions are evaluated by determining the sensitivity of project economics to changes in baseline economic variables.

The projects evaluated assume gas sales from PBU start in 2005 and reach a peak rate of 2.05 billion cubic feet per day (BCFPD) in 2009, and sales from PTU starting in 2008 at 0.44 BCFPD, for a combined peak rate of 2.49 BCFPD. This results in sales of 17 million metric tonnes per year of LNG, or 300 thousand barrels per day of a GTL liquid hydrocarbon product compatible with the North Slope crude oil and transportable in the Trans Alaska Pipeline System (TAPS). The total investment (1995\$) for the LNG option is \$17 billion and \$13 billion for the GTL option. Both include investments necessary to develop PTU.

The results of the economic evaluations, prepared using the Energy Information Administration 1995 Reference Oil Price forecast that anticipates real oil price growth of about 2.4%/yr, indicate that both LNG and GTL project options will be profitable (10% rate of return on investment) for the gas project developers. In addition, economic returns to the PBU and PTU gas producing units will be higher than they would be without gas sales. Also, of the two options, the GTL route assures minimum flow rates needed to extend TAPS operability for about 20 years after existing North Slope oil-producing reservoirs are largely depleted.

In summary, both the LNG and the GTL options are economically promising and warrant consideration in industry and government decision-making. However, at this point in time, it is not possible to conclude that one option is significantly better than the other. Focused follow-up investigations to this study would be of value to industry and State of Alaska decision makers, and are recommended.