

The Past and Future of LNG in Alaska *November 2005*

Why do negotiations between the State and the North Slope gas producers ignore LNG [liquefied natural gas] export proposals, including that of the Alaska Gasline Port Authority [AGPA]?

By Arlon R. Tussing¹

The three main North Slope gas producers [ConocoPhillips, BP and ExxonMobil], and Alaska's Murkowski Administration, agree that an overland pipeline from Prudhoe Bay, crossing Canada to the U.S. Midwest, is the most promising transport system under present and foreseeable conditions, for marketing Arctic gas.

Nevertheless, plans to ship LNG in “cryogenic” [low-pressure refrigerated] tankers from a Southcentral Alaska port such as Valdez or Kenai, to the Lower 48 or East Asia remain *technically plausible* marketing alternatives to a transcontinental gas pipeline. Currently, the most prominent proposal for such an alternative is sponsored by the Alaska Gasline Port Authority [AGPA], a coalition of three municipalities—the North Slope and Fairbanks North Star Boroughs, and the City of Valdez—which are located North to South along the route of the Trans-Alaska oil pipeline from the Arctic Ocean to Prince William Sound.

Alaska business interests (with the notable exception of North Slope oil and gas producers), State legislators, and according to some opinion surveys, a majority of the Alaska public, have consistently tended to prefer one variant or another of the LNG alternatives (often misleadingly labeled as “All-Alaska” systems) to any overland pipeline scheme.

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- Advocates of marketing North Slope gas as LNG look to a precedent of almost four decades of LNG exports from a liquefaction plant at Nikiski on Alaska's Kenai Peninsula, to supply electrical-generation fuel in Japan. This traffic, which commenced in the 1960s, constituted the world's second-ever intercontinental LNG project, and most of the initial sales market that supported development of natural-gas resources in the Cook Inlet Basin, which resources continue to supply a major share of the residential and commercial energy demand in Anchorage and Alaska's Railbelt region.
- A second influential precedent for LNG advocates in Alaska is the endorsement and vigorous support that the Alaska Legislature and Executive Branch gave in the mid-1970s to an unsuccessful proposal of El Paso Natural Gas Company to export North Slope gas as LNG to California, in a competition before the Federal Power Commission [FPC] and its successor, the Federal Energy Regulatory Commission [FERC], between El Paso's LNG plan and sponsors of two rival schemes for pipeline systems crossing Canada into the Lower 48.²
- The conditions that first made an LNG project economically viable and attractive to the Cook Inlet gas producers, Japanese electric utilities, and the State of Alaska in the 1960s included world-scale gas reserves that had been discovered near tidewater in the search for oil, and which were then surplus to a miniscule local natural-gas market. Moreover, U.S. maritime law permitted use of relatively low-cost foreign-owned, -built, and -operated tankers for **export of LNG to Japan**.
- These favorable conditions mostly evaporated in the 1980s and 1990s as the Cook Inlet gas reserves were deeply drawn down by sales for LNG exports to Japan, fertilizer manufacture (also largely for export), and expanding local gas demand. The federal export license for the Kenai LNG plant is thus scheduled to expire in 2009, absent an unlikely showing to the Federal Energy Regulatory Commission [FERC] that large new Cook Inlet reserve additions have made the proposed exports surplus to local need. In the 21st Century, Japan and other East Asian markets can now look toward larger LNG and pipeline-gas supply alternatives in Sakhalin and East Siberia, Southeast Asia and the Middle East, at prices that are likely to be much lower than new purchases from Alaska.

Notwithstanding enduring devotion on the part of Alaskan advocacy groups, LNG alternatives to a pipeline through Canada for marketing Arc-

2 The United States and Canadian governments ultimately rejected the El Paso plan, and "certificated" (approved construction and ownership of) an international pipeline proposal very similar to the plan now supported by the three major ANS leaseholders and Alaska's Murkowski administration.

*tic natural gas have never had much credibility or support from energy or financial analysts, major gas producers, or other prospective shippers of North Slope gas such as Lower-48 gas-pipeline companies, local gas distributors, and industrial gas users.*³

- The decisive consideration that has sustained a broad preference (except among sectoral and local interests in Alaska), for overland pipeline gas transport over marine shipments of LNG from Alaska targeted to marine terminals on the West Coast, is the existence of a broad, densely interconnected band of pipelines stretching from the Upper Midwest into the Gulf States and beyond. This network creates an integrated natural-gas market that is several times larger than any market that could be accessed directly from a marine LNG terminal on the West Coast.
- It follows that any given volume of Alaska gas production delivered into a pipeline hub near Chicago would face a more robust and reliable destination market, and have less tendency to depress prices in that market, than would delivery of similar volumes as LNG into the Pacific Northwest or California.

Over the next twenty years, long-distance shipments of LNG from foreign sources into Lower 48 ports will almost certainly make up the biggest additions both to America's natural-gas supply and to America's total supply of primary energy. LNG receiving terminals are likely to be built on the three major coasts of North America: Pacific, Gulf of Mexico, and Atlantic.

This outlook stems from the interaction of several fundamental differences between domestic and international markets for natural gas and LNG:

- Recent expansion of domestic natural-gas demand in North America has resulted from (1) continuing general economic growth, (2) the technical superiority and greater energy and cost-efficiency of gas-fired combustion turbines in generating electricity, compared to coal-, oil-, or nuclear-powered steam plants, and (3) stricter restrictions and penalties on greenhouse-gas emissions;

³ In the 1970s, two large California gas distribution companies sought financing and government approval for liquefaction of Cook Inlet natural gas and its sale in California. This project was abandoned in the early 1980s because of the increasing abundance of conventional Lower-48 gas supplies and public fears regarding the safety of LNG.

- Maturation of established gas-producing basins has led to lagging replacement rates for domestic gas reserves in the United States, and also (since about 2002) for the first time in Canada;⁴
- In sharp contrast to these North American conditions is the existence outside the United States and Canada of huge inventories of known but undeveloped gas reserves, and expanses of highly prospective territory which (although sometimes intensively searched for oil) are thus far virtually unexplored for natural gas; and the location of many of these opportunities near tidewater and thus easily accessible for export as LNG;⁵ plus
- Recent and ongoing technical advances in the treatment and liquefaction of natural gas for shipment as LNG and in the design and operation of cryogenic ocean carriers, promise dramatic reductions in the resource cost of LNG delivered to North American ports.

⁴ According to BP's *2005 Statistical Review of World Energy*, proved gas reserves in both the United States and Canada at the end of 2004 were stagnant near a long-term theoretical and empirical minimum "life index" of current production [**reserves-to-production ratio**] **equivalent to about 9.5 years**.

⁵ **For the whole world excluding the United States and Canada**, in contrast, the "life-index" ratio of year-end 2004 gas reserves to 2004 gas production, was almost nine times greater, according to the *BP Survey*. Despite recently fashionable speculation about an impending final "peak" in both world oil and gas production, new gas discoveries **have increased the global life index** of natural-gas reserves **from 64 years at year-end 1994, to 88 years in 2004!**

The foregoing developments that are generally favorable to imports of LNG from foreign sources to the Lower 48 may, in addition, make LNG imports to Alaska an attractive supply alternative for Anchorage and the Railbelt. However, these conditions are not likely to improve the economic prospects for sales of North Slope natural gas as LNG in either Lower-48 or East Asian markets.

LNG from Alaska North Slope gas is almost certain to be an incurably high-cost competitor in both domestic and East Asian ports, relative to such foreign LNG sources as Sakhalin, Northwest Australia, East Timor, South America, or Qatar, where newly producing “supergiant” fields are located nearer to potential liquefaction sites and export terminals. None of these prospective alternative sources of LNG for North America will require capital outlays for processing and transport upstream of the liquefaction plant, even remotely comparable to the outlays that would be needed for export of North Slope gas as LNG.

- LNG from North Slope natural gas would have to undergo the expense of treatment at a conditioning plant in the ultra-high construction-cost environment of the Arctic Slope, followed by the expense of transmission through a 800-mile pipeline across Alaska with its comparably high construction costs—**before** encountering liquefaction and storage facilities and then embarking on a marine tanker voyage **whose cost alone** might be comparable to the **total costs** borne by a shipment to the U.S. West Coast from a tidewater gas field in another Pacific Rim country.
- Another handicap faced by LNG from Alaska in U.S. markets, relative to LNG from East Asian, South Pacific or South American sources, stems from U.S. maritime law (specifically the 1920 “Jones Act”), which requires water transport between U.S. ports to use only vessels owned by U.S. citizens, built and equipped in the United States, and manned by American crews. With this handicap, it is conceivable that the marine voyage costs alone from an Alaska LNG port to a port on the West Coast, might be comparable to the **total costs** borne by a shipment to the U.S. West Coast from a tidewater gas field in another Pacific Rim country
- However, because this “cabotage” law does **not** apply to shipments of LNG from foreign sources into Lower-48 ports, it is probably sufficient in itself to create an insuperable competitive handicap for LNG from Alaska, both relative to LNG

from Indonesia, Australia, or Russia, and relative to natural gas from Alaska shipped by pipeline to the Lower 48.^{6,7}

Ironically, some of the very features of LNG-based marketing schemes for North Slope gas that have a special attraction for their Alaska advocates, also tend to deter support from North Slope producers and other prospective investors and gas shippers. Chief among these features are . . .

- The LNG system's need for roughly the same pipeline mileage within Alaska as a transcontinental pipeline, and for a similar North Slope gas-treatment and conditioning plant, with their attendant high construction expenses, plus . .
- The added expense, including employment expenses ("jobs") associated with building and operating a multi-billion-dollar gas-liquefaction plant and marine terminal in Southcentral Alaska; in addition to . . .
- Other system configuration and design choices express the hopes or promises of Alaskan LNG advocates to divert part of the produced gas from secure, high-value sales markets in the Lower 48 to new in-State uses—which, relative to export sales, are likely to be speculative, discounted and/or subsidized.

The sponsorship and prospective governance of the LNG delivery system proposed by AGPA is inherently unsettling to those parties whose paramount interests in a pipeline are most directly expressed as a function of the present value of expected gas-sales revenues—the North Slope leaseholders and Alaskans generally as beneficiaries of State services and the Permanent Fund.

- What tends to be particularly troublesome about the AGPA proposal is that it is a creature of three small municipal entities that have different sets of perceived self-interests or public purposes, none of which is the single concern—netback sales revenues—which most preoccupies and aligns the interests of the four major gas shipper/marketers.

⁶ It has been more than 25 years since an LNG tanker has been built in any American yard; the estimated capital cost of domestically built tankers is about three times, and the operating costs of U.S.-owned and manned tankers at more than twice those of foreign vessels. About 85 years of experience under the Jones Act suggests that there is close to zero likelihood that Congress would grant Alaska LNG a waiver of these restrictions.

⁷ One strategy suggested for avoiding the Jones Act disabilities is to locate the West Coast LNG receiving terminal in Canada or Mexico, and to re-import the regasified product into the United States by pipeline. If ultimately deemed lawful under maritime law and approved by FERC, this arrangement would involve additional construction and operating costs for the trans-border pipeline link.

- Advocates of an LNG system, including AGPA, tend to emphasize its merits largely in terms of indirect “benefits” such as construction contracts, payrolls, and “low-cost” (i.e., likely discounted or subsidized) fuel targeted to specific communities or enterprises. Such impacts tend to be, or at least may be, negatively correlated with shippers’ net returns from gas sales. Each resulting increase in transport costs per unit of delivered gas, and each such reduction in final sales volumes or revenues, implies a loss of net income from gas sales to the largest and ultimately most influential Stakeholder groups and Stakeholder institutions—the producers, the state general fund, and the Permanent Fund.

The combined effect of the foregoing conditions makes it more likely, in our judgment, that imports of LNG from Sakhalin or another foreign source into Alaska will take place to supplement dwindling (or fears of dwindling) Cook Inlet gas reserves, before any gas from Prudhoe Bay is exported commercially as LNG.