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Proposed Alaska Natural Gas Pipelines: Potential Impacts on the Steel Industry

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Proposed Alaska Natural Gas Pipelines: Potential Impacts on the Steel Industry

Summary

Natural gas finds associated with oil production on the Alaska North Slope are a large national resource, whose use is restricted because of the very high cost of delivering this gas to markets. Congress authorized construction of a pipeline in 1976 and President Carter selected a route to follow the existing Alaska oil pipeline and the Alaska Highway. So far, the Alaska pipeline has not been considered commercially feasible, although two separate consortia have recently filed project applications with the state of Alaska. Meanwhile, plans are moving ahead to build a pipeline via a Canadian route, to bring gas from the Mackenzie River delta to the major North American markets.

Both Houses of Congress approved legislation in 2002, and again in 2003, to encourage development of a pipeline. An $18 billion loan guarantee for constructing the Alaska natural gas pipeline was initially included on the Senate side, and adopted as part of the conference report on H.R. 6, the Energy Policy Act of 2003 (H.Rept. 108-375). The conference report was approved on November 18, 2003, in the House, but the Senate failed to close debate on the bill during the first session. Congress did pass, and the President signed, the FY 2004 comprehensive appropriations bill, (P.L. 108-199), which contains a provision that could extend the loan guarantee to construction of facilities to liquefy Alaska natural gas, including ships to transport this product to the U.S. West Coast, if the loan guarantee provision itself becomes law.

The 2002 Senate-approved bill included a price support mechanism, to insure a "price floor" for Alaskan gas in the U.S. market. This same bill was re-approved in the Senate in 2003, but the House has never voted for the price-support mechanism, and it is not in the H.R. 6 conference report. The Bush Administration opposes the price floor provision. The Canadian government has also expressed its opposition to any policy of government intervention that would disfavor Canadian natural gas in the U.S. market.

If a pipeline were to be built, it would provide a significant boost to demand for steel in North America, as the American Iron and Steel Institute (AISI) estimates that 3 to 5 million tons of steel could be required, depending on the route and design of the pipeline, and that up to 14,000 "work years" could be generated in the steel and pipe industry. AISI believes that sufficient capacity exists or can be readily developed in North America for manufacturing the necessary steel pipe. H.R. 6 contains a "sense of Congress" resolution that North American steel should be used in the project. ExxonMobil Corporation, one of the three developers of Alaska North Slope oil and gas, has announced an agreement with two Japanese companies to commercialize a new type of steel that could reduce Alaska pipeline costs.

This report explores the economic and industry tradeoffs inherent in current efforts to commercialize Alaska North Slope natural gas, and the impact on the steel industry. The report will be updated as warranted.

Contents

List of Figures

Proposed Alaska Natural Gas Pipelines: Potential Impacts on the Steel Industry

Introduction: An Alaska Natural Gas Pipeline

Alaskan natural gas is a major potential U.S. energy resource that is largely untapped. The Alaska Department of Natural Resources estimates recoverable gas reserves in the Prudhoe Bay oil field at about 30 trillion cubic feet (tcf), which is the energy equivalent of about 5.3 billion barrels of oil. For comparison, the entire annual U.S. consumption of natural gas is approximately 20 tcf. But most of the gas that has so far been produced on Alaska's North Slope, 80% of the 8 to 9 billion cubic feet produced annually, has been reinjected back into the ground. Only a small amount has been used for operations in conjunction with oil production and transportation, such as powering oil through pipelines, and other local uses.

This resource has not so far been developed because of a lack of any means of cost-effective transportation to major markets. Using a more stringent definition than the state, the Energy Information Administration (EIA) of the federal Department of Energy estimates that proved natural reserves in the entire state of Alaska are 9.7 tcf – because absence of a pipeline, or near-term prospects for a pipeline, render the rest of Alaska's gas reserves commercially unrecoverable.[1] If a pipeline were to be built, it would be a major project from the perspective of the steel industry.

Congress has established a statutory framework for an Alaska natural gas pipeline. The legislative authority for designation of an Alaska natural gas pipeline route, and for the U.S. role in the approval, construction and operation of such a pipeline, was established in the Alaska Natural Gas Transportation Act of 1976 (15 USC 719 *et seq.*), which remains in effect. Acting under that framework, a private sector consortium has planned a natural gas pipeline that would parallel the existing Alaska oil pipeline (Trans Alaska Pipeline System) from the North Slope to Fairbanks, then head southeastward along the Alaska Highway and into Canada via the Yukon Territory, British Columbia and Alberta. This is the proposed Alaska Natural Gas Transportation System (ANGTS), which has received approvals and agreements from the U.S. and Canadian governments.[2]

According to Foothills Pipe Lines, the Canadian-based consortium partner jointly owned by TransCanada Pipelines Ltd. and Duke Energy, "the project currently stands in an advanced state of readiness awaiting market demand." Phase I ("Prebuild") of the ANGTS pipeline was actually completed in the early 1980s and

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[1] CRS Report RL31278. *Arctic National Wildlife Refuge: Background and Issues*, p.42.

[2] CRS Report RL31278, pp. 44-45.

is in operation. Its two legs, stretching from a central collecting point in Alberta respectively in the direction of the U.S. West Coast and the Midwest, deliver one-third of Canada's total annual gas exports to the United States.[3]

But the crucial third leg, connecting the "prebuilt" network to the North Slope, has never been started. It would run for 2,140 miles, from Prudhoe Bay to Edmonton, Alberta.[4] Extension of an additional pipeline to the Midwest, to add capacity to the current network, would yield a total length of 3,500 miles.[5] The planned ANGTS pipeline along the Alaska Highway route and the completed lower legs of the pipeline into the United States are shown in Figure 1.

Different Approaches to an Alaska Natural Gas Pipeline

Location of the Pipeline

The geographical location of an Alaska natural gas pipeline is not fully settled. According to one press report, it is not clear whether rights granted by U.S. and Canadian authorities in the 1970s to build the ANGTS pipeline are still valid.[6] In January 2004, two consortia filed proposals with the Alaska state government to build a gas pipeline along the Alaska Highway route, but with some changes from the existing ANGTS plan. One group was a consortium that included the three North Slope oil and gas producers. The other consortium is led by MidAmerican, a major U.S. pipeline operator. It is requesting permission to build a 745-mile pipeline from the North Slope to a point on the Alaska Highway at the Yukon border. A Canadian partner would complete the pipeline to join the "prebuilt" pipeline in Alberta.[7]

Meanwhile, a separate group, the Arctic Resources Consortium (ARC), based in Canada, has promoted an alternative Northern Route Gas Pipeline Project (NGPP). This project is proposed to access the Prudhoe Bay gas field in Alaska, then to swing offshore across the top of the state, under the Beaufort Sea, and to join the existing Alberta pipeline connection via the Mackenzie River (see Figure 1). This route could then also serve to deliver to the North American market the more recently found gas reserves of the Mackenzie Delta, as well as the Alaska North Slope gas.

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[3] Information from the website [http://www.foothillspipe.com].

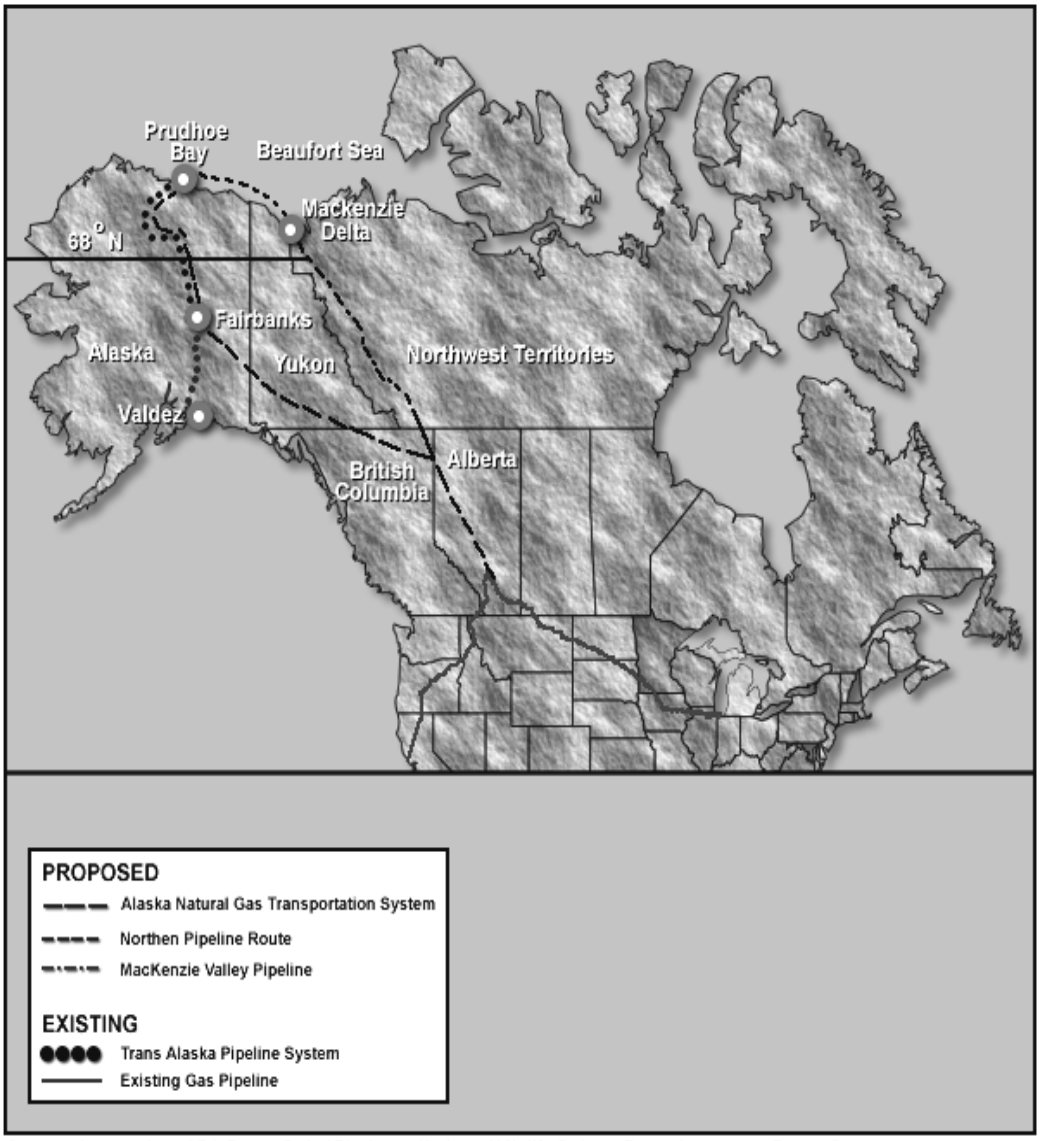
[4] The length of 2,140 miles is from a chart in Arctic Resources Corporation (ARC). *The Right Solution to Tap Arctic Gas* (Nov. 12, 2002), Fig. 2 [http://www.arcticresources.com]. It was confirmed to the author by EIA on Nov. 19, 2003.

[5] Sen. Lisa Murkowski. "Murkowski Says Gas Loan Guarantee Designed to Help Get Alaska Natural Gas to Market, Regardless of Final Project," press release, Dec. 2, 2003.

[6] Larry Persily, "TransCanada Wants Piece of Pipe," *Petroleum News* (Feb. 8, 2004), p. 4.

[7] Larry Persily, "The Wait Is Over," *Petroleum News* (Jan. 25, 2004), p. 1; and, "Exxon Unwilling to Line Up," *Petroleum News* (Feb. 8, 2004), p. 1; Mid American Energy Holding Co., "Application Filed to Build Alaska Pipeline," press release (Jan. 22, 2004).

Figure 1. Alaska Oil and Gas Pipelines



Source: Adapted from CRS Report RL31278, ***Arctic National Wildlife Refuge***, Figure 6, based on Energy Department maps

A Mackenzie River pipeline would require a separate 1,350 mile project. ARC claims that it could feasibly build a single 1,665-mile pipeline connecting both Alaska North Slope and Mackenzie Delta gas to North American markets.[8] It states that the route originally fell out of consideration when President Carter decided on the Alaska Highway route in 1977, in part because of Canadian aboriginal claims issues, which were still unsettled at that time.[9] In June 2003, TransCanada Pipelines joined this consortium and agreed to fund participation by a group representing indigenous

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[8] ARC, *Right Solution*, Fig. 2 and p. 7.

[9] *Ibid.*, p. 4.

Canadians, to allow them to participate in a Mackenzie River project, which may be going ahead on its own, regardless of any connection to Prudhoe Bay.[10]

The Alaska state legislature enacted a law that bans construction of a gas pipeline in northern state waters, while strongly supporting proposals for a pipeline to the south. As noted in an earlier CRS report, "... State officials see a greater gain through the income multiplier effect of construction within the state and greater access by Alaskan communities to the new gas supplies. Also at issue is the fact that a Canadian route would likely serve new Canadian gas fields, which would then compete with Alaska in U.S. markets."[11]

The Senate-passed version of the energy bill in the 107th Congress agreed with the Alaskan position. It provided that no pipeline could be constructed for Prudhoe Bay gas that traverses the submerged lands of the Beaufort Sea, as well as its adjacent shoreline, and that enters Canada "at any point north of 68°N latitude " (Sec. 704(d) of H.R. 4). In a March 2003 article, Peter Behr of the *Washington Post* stated that the route along the Alaska Highway was "mandated by the Senate last year to secure the greatest number of construction jobs for Alaskans."[12]

In the 108th Congress, the House on April 11, 2003, passed a new version of its energy bill, H.R. 6, which included as Sec. 12004(d) this identical provision on location of the gas pipeline. The same provision was also included as Section 133(d) of S. 14, as approved by the Senate Energy and Natural Resources Committee on April 30, 2003. But S. 14 also included a "sense of Congress" provision (Sec. 145) that, as North American gas demand will continue to increase, it will be necessary to complete a separate Mackenzie Delta natural gas project, and that "Federal and State officials should work together with officials in Canada to ensure both projects can move forward in a mutually beneficial fashion." This section further noted that, "Federal and state officials should acknowledge that the smaller scope, fewer permitting requirements and lower cost of the Mackenzie Delta project means it will most likely be completed before the Alaska Natural Gas Pipeline."

The provisions on location of the Alaska pipeline and on the Mackenzie River pipeline were both included in the conference report on H.R. 6 (Energy Policy Act of 2003), which was considered on the floors of both houses before the end of the first session of the 108th Congress. The conference report included the language on location of a gas pipeline as Sec. 373(d). The provision on the Mackenzie River pipeline was included as Sec. 384. The H.R. 6 conference report was passed by the House 246-180 on November 18, 2003. In the Senate, however, a cloture motion to

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[10] Peter Behr, "Agreement Advances Canadian Gas Pipeline; Project Moves Ahead of Alaska Proposal," *Washington Post* (June 19, 2003), p. E4; "Canadian Gas Pipeline Takes Big Step in Deal with Arctic Indigenes," Agence France Presse (June 19, 2003); David Pike, "Accord on Canadian Gas Pipeline Could Unleash Drilling Boom," *International Oil Daily* (June 23, 2003); Gary Park, "Gas Line on Track," *Petroleum News* (Jan. 18, 2004), p. 1.

[11] CRS Report RL31278. *Arctic National Wildlife Refuge: Background and Issues*, p. 47.

[12] *Washington Post*. "Natural Gas Line Proposed in Alaska," by Peter Behr (Mar. 26, 2003).

limit debate on H.R. 6 failed (57-40) on November 21, 2003, and no further action was taken in the first session.[13]

Financing the Pipeline

Another key question on approaches to building a pipeline is the matter of government financial support. The three major North Slope oil and gas development companies, ExxonMobil, ConocoPhillips and BP, undertook a joint study of the costs of a natural gas pipeline, especially in view of a rise in the North American price of natural gas. The study, completed in April 2002, estimated the cost of a new pipeline as $19.4 billion if the ANGTS route were used, and $18.6 billion if it followed the NGPP route. Either way, the companies concluded that the cost was prohibitive for natural gas to be commercially delivered to the U.S. market, even at relatively high natural gas price levels.[14]

In response to this question of cost, the Senate has considered a number of financial measures to support construction of an Alaska pipeline. In 2002 it included a $10 billion loan guarantee for private sector parties that would undertake the project (Sec. 710 of H.R. 4, as approved in April 2002), and a price floor mechanism that would guarantee a minimum price for Alaskan natural gas through tax credits (Sec. 2503 of the same bill). In the 108th Congress, the Senate Energy and Natural Resources Committee increased the Alaska natural gas pipeline loan guarantee to $18 billion when it approved S. 14 (Sec. 144). The price floor provision was included as Section 511 of the revised Energy Tax Incentives Act (S. 1149) reported by the Senate Finance Committee.[15] The stated intention of the Energy Committee was to amend the Energy Tax Incentives Act "into S. 14 during floor action."[16]

BP and ConocoPhillips reportedly stated that they would not go forward with development of a pipeline without approval of these incentives.[17] ExxonMobil opposes the incentives. The company believes that such a project should only go forward without incentives and price supports.[18] However, after initial hesitation, it joined the "producers' consortium" in submitting a project proposal in January 2004.[19]

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[13] H.R. 6 procedural details are summarized in CRS Issue Brief IB10116, *Energy policy: The Continuing Debate and Omnibus Energy Legislation (H.R. 6)*, by Robert L. Bamberger, pp. 1 and 4-6.

[14] Interview with ExxonMobil spokesman Bob Davis, April 25, 2003. The study assumed that the pipeline would be completed to Chicago, so it could be possible to effect some savings if capacity could be shared with the existing ANGTS "prebuilt" pipeline to the Midwest.

[15] See S.Rept. 108-54, part J.

[16] Senate Committee on Energy and Natural Resources. "Highlights of the Energy Policy Act of 2003 and the Energy Tax Incentives Act of 2003," press release, May 1, 2003.

[17] Behr article, *Washington Post*, Mar. 26, 2003.

[18] Davis interview, Apr. 25, 2003.

[19] "Exxon," *Petroleum News* (Feb. 8, 2004), p. 10.

The Bush Administration in 2002 indicated its opposition to the "price-floor subsidy provision ... and any similar provision because it would distort markets, could cost over $1 billion in annual lost revenue, and would likely undermine Canada's support for construction of the pipeline and thus set back broader bilateral energy integration."[20] The Statement of Administration Policy of May 8, 2003, on Senate energy legislation reiterated opposition to "the price-floor tax subsidy provision in the Senate Finance Committee bill, because it could distort markets and could be very costly."[21] In response, Senators John Breaux, Jeff Bingaman and Tom Daschle wrote President Bush on May 21, 2003, asking him to "reconsider" this position. The three senators argued that, "Given the inevitable volatility of gas prices over the 50 year life of this project, this Administration position effectively means that no pipeline will be built ..."[22]

The Canadian government position has been one of declared official neutrality between the two (or more) potential routes, but opposition to any mandated, unilateral selection of routes by the U.S. government, particularly if this is included in a policy utilizing price support mechanisms for Alaskan gas, which Canada strenuously opposes.[23] Price supports and any other mechanisms that favor Alaskan gas over imports from Canada also raise trade policy questions under World Trade Organization agreements.

The conference report of November 18, 2003, on H.R. 6 (H.Rept. 108-375) included the loan guarantee provision as approved in the Senate Energy Committee, but did not include the price floor/tax credit mechanism to reduce the risk of low natural gas prices. Section 386 would authorize the Secretary of Energy to issue a guarantee within two years after a "final certificate of public convenience and necessity (including any Canadian certificates of public convenience and necessity) is issued for the project." As in the version approved earlier by the Senate Energy Committee, the guarantee would be for 80% of the total cost of a "qualified" project, up to $18 billion.

According to a press report, ConocoPhillips has publicly confirmed that it will not participate in the pipeline project without a price floor mechanism. An Alaska executive of the company informed a conference in Anchorage on November 20, 2003, that, "We're not going to be able to advance the project without the risk mitigation." The same press source noted that BP was still "interested" in moving forward with the project, though it would find the risk-mitigation tax credit "helpful."[24]

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[20] Secretary of Energy Spencer Abraham. Letter to Rep. W.J. Tauzin, June 27, 2002.

[21] Office of Management and Budget. "Statement of Administration Policy: S. 14 – Energy Policy Act of 2003" (May 8, 2003), p. 2.

[22] Sens. Breaux, Bingaman and Daschle. Letter to President George W. Bush, May 21, 2003.

[23] Ambassador of Canada Michael Kergin. "Trust the Market (and Canada)," article in *Wall Street Journal*, May 15, 2002; Letter to U.S. Under Secretary of State for Economic Affairs Alan P. Larson, Sept. 17, 2002.

[24] Tim Bradner, "ConocoPhillips Out of Gas Line," *Alaska Journal of Commerce* (Nov. 30,

(continued...)

The Liquefied Natural Gas Option

High prices for natural gas since 2000 have revived interest in the United States and abroad in developing liquefied natural gas (LNG) technology. LNG is gas that has been liquefied by cryogenic technology, transported in special-purpose carriers, then regasified for normal commercial use. All four LNG plants that were built in the United States in the 1970s have been reopened, and more are currently being considered, including on the U.S. West Coast.[25]

Thus, another possibility that has emerged is a new natural gas pipeline wholly within Alaska to feed an LNG operation. From there, the LNG could be transshipped by special-purpose maritime carriers to domestic or foreign markets. Alaska voters in a November 2002 referendum by 61% authorized a new state authority to build a gas pipeline to parallel the existing oil pipeline from Prudhoe Bay to Valdez, and to build a new LNG plant there.[26] But ConocoPhillips Alaska representatives in July 2003 shared with members of the new Alaska Natural Gas Development Authority the results of an extensive multi-company industry study, which concluded that an Alaska North Slope LNG project was not commercially competitive with other LNG projects.[27]

To enhance the prospects for such an alternative, Senator Lisa Murkowski sought to "provide equal financial incentives" for federal support in transporting Alaska natural gas to U.S. markets, "whether that gas moves by pipeline through Canada or by tanker from Alaska's south coast."[28] She succeeded in adding to H.R. 2673, the comprehensive appropriations bill considered at the end of the first session of the 108th Congress, a provision to achieve this purpose. Section 146 of the conference report on the bill "amends Section 386 of the Energy Policy Act of 2003 to permit the consideration of an option providing a loan guarantee for [an LNG] transportation

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[24] (...continued)
2003).

[25] Dept. of Energy. EIA. *The Global Liquefied Natural Gas Market: Status & Outlook* (DOE/EIA-0637), December 2003. Chairman Alan Greenspan of the Federal Reserve Board (FRB) has emphasized the potential role of LNG in relieving recurrent U.S. natural gas shortages and price volatility; see FRB, Testimony of Chairman Alan Greenspan, "Natural Gas Supply and Demand Issues," House Committee on Energy and Commerce (June 10, 2003). See also Bureau of National Affairs. *Daily Report for Executives* (*DER*), "Four-Year Spike in Natural Gas Prices Alters Consumption, Development Outlook, EIA Says" (Dec. 17, 2003); Susan Warren, "Qatar Pursues Natural Gas Deals," *Wall St. Journal* (July 14, 2003), p. B4; Wesley Loy, "State to Court Asian Buyers for Natural Gas," *Anchorage Daily News* (Aug. 12, 2003), p. F1.

[26] Ben Spiess, "Ulmer Authorizes Gas Pipeline Referendum for November 5 Ballot," *Anchorage Daily News* (Mar. 13, 2002), p. F4; Tim Bradner, "Voters Approve Gas Authority; Now What?" *Alaska Journal of Commerce* (Nov. 17, 2002), p. B1.

[27] Kristen Nelson, "LNG Not Cost Competitive for ConocoPhillips," *Petroleum News* (July 13, 2003), p. 2.

[28] Sen. Lisa Murkowski, "Murkowski Says Gas Loan Guarantee Designed to Help Get Alaska Natural Gas to Market ..." press release (Dec. 2, 2003).

project in Alaska."[29] It limits the principal in the LNG portion of the project that could receive the federal loan guarantee to $2 billion, out of the total $18 billion limit. The cost of building LNG tankers could be included.[30] A House opponent of the measure stated in a letter to colleagues on the Energy and Commerce Committee that this provision had been rejected in subcommittee, with bipartisan opposition, and represented an unwarranted subsidy for construction of LNG facilities.[31] H.R. 2673, including Sec. 146, passed the House 242-176 on December 8, 2003, and the Senate by 65-28 on January 22, 2004. It was signed into law (P.L. 108-199) by President Bush on January 23, 2004.

Pursuit of the LNG option would entail a much shorter pipeline (the Trans Alaska oil pipeline is about 800 miles long) and therefore would imply use of a much smaller amount of steel. Of course, if the federal guarantee is used, an additional amount of domestic steel may be required for building Jones Act-qualified LNG tankers. Senator Murkowski has emphasized that her amendment to H.R. 2673 and thereby to Section 386 of H.R. 6 only serves to give Alaska the additional flexibility it has sought in bringing its natural gas to the U.S. market.[32] Unless the underlying bill, H.R. 6, is passed, any amendment to Section 386 remains moot. The companies that own the gas remain less interested in an LNG project, and, along with Alaska Governor Frank Murkowski, continue to emphasize the Alaska Highway pipeline.[33]

Impact on the Steel Industry

The impact of an Alaska natural gas pipeline on employment and revenues in the steel industry could be significant. The American Iron and Steel Institute (AISI) supports the project, though it has been neutral with respect to routing and financing issues. It estimated, for example, in a statement attached to a letter to then-Senator Frank Murkowski, who was then ranking member of the Energy and Natural Resources Committee, that the project could generate "up to 10,000 work years of

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[29] Description quoted from H.Rept. 108-401, p. 1180. See account in Larry Persily, "Federal Loan Guarantee Extended to LNG," *Petroleum News* (Dec. 7, 2003), p. 13.

[30] Inclusion of the cost of building LNG tankers is justified on grounds that they would have to be U.S.-built and -manned under the Jones Act, and therefore the price of construction may be "two to three times as much as foreign-built ships;" Sen. Murkowski press statement (Dec. 2, 2003).

[31] Rep. Ed Markey, letter to Reps. Joe Barton and John Shimkus (Dec. 2, 2003) and "Markey Calls on Republicans to Reject Secret Subsidy for LNG in Omnibus Spending bill," press release (Dec. , 2003).

[32] Sen. Murkowski, press release (Dec. 2, 2003).

[33] Christian Schmollinger, "Pork Barrel Language No Guarantee for Alaska LNG Project," *Oil Daily* ((Dec. 4, 2003);Associated Press, "Governor Pushes Alaska Highway Pipeline Route ..." *Anchorage Daily News* (Dec. 2, 2003), p. F2; Tim Bradner, "Pipeline Firms Eye Highway Line," *Alaska Journal of Commerce* (Dec. 14, 2003), p. B1. For an earlier CRS report that reviews technical aspects of all these options, see CRS Report RL31165, *Natural Gas Reserves in Alaska: An Overview of Conventional and Non-conventional Development and Transport Options*.

direct employment from North American steel supply. In addition almost 4,000 additional work years would be used to manufacture pipe from steel."[34] This estimate was based on the use of 3 to 5 million tons of steel. By comparison, in 1999-2000, "three North American steel pipe producers supplied over 1,000,000 tons of steel for the 2,000 mile Alliance Pipeline running from Northern British Columbia to Chicago," which AISI claimed to be "the most technologically advanced and largest pipeline construction project ever in North America."[35] The total production of steel in the United States has recently been about 100 million tons per year, with imports adding roughly 20-30 million tons to meet U.S. demand.

The relative capabilities of U.S. and Canadian industries to supply steel for the project would depend on a number of variables, including the time frame for completing the project, the route chosen and the pipeline specifications.[36] According to AISI, gas producers have indicated that they would require a pipe of maximum capacity, to ensure the ability to transport a high enough volume of gas to earn an adequate return on a privately financed system.

The maximum diameter considered is 52 inches, capable of delivering 6.0 billion cubic feet of gas per day (Bcf/d), as indicated in data provided by AISI. But 52-inch pipe has only been produced in very limited capacities in North America (or anywhere else) and the rating requirement for producing such pipe in the necessary quantity at reasonable cost and timeliness may be larger than the X80 grade that is currently the highest available. Use of this size and grade of pipe would create a high level of logistical complexities in pipeline construction and operation, requiring 48 compressor stations along the ANGTS route. Using a 48-inch pipe would reduce operational and construction difficulties somewhat, and it could be made from X80-rated steel, but would reduce capacity to 4.0 Bcf/d. Downsizing to a 42-inch pipe would substantially reduce retooling costs, but would also reduce capacity to 2.0 Bcf/d. Arctic Resources Corporation claims that construction and operational difficulties could be minimized by laying twin 36-inch X80 pipes along the proposed NGPP/Mackenzie River route, where, it believes, construction difficulties would be

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[34] The phrase "North American steel" is used throughout this report and most AISI documents, instead of "U.S." steel. The U.S. and Canadian steel industries are highly integrated. Moreover, if any pipeline were to run through Canada, agreement by that country's government and participation by Canadian steelmakers in any competitive bidding process would presumably be required.

[35] Quotations from Andrew G. Sharkey, III, AISI. Letter to Sen. Frank Murkowski (April 17, 2002), with attached statement. Estimates of total amounts of steel from interviews with Chip Foley, AISI, April 22 and 24, 2003. Other sources identified the three major steel pipe suppliers as Ipsco, Inc.; the Welland Pipe unit of Stelco; and, Oregon Steel's pipe mill in Napa, California, with participation also by Berg Steel Pipe; interviews with Martha Gibbons, Ipsco, Inc., and Tom Danjczek, Steel Manufacturers Association (May 1, 2003).

[36] The 800-mile Trans Alaska oil pipeline was built in the 1970s using 500,000 tons of special cold-weather steel 48-inch diameter pipe imported from Japan. U.S. Dept. of the Interior, with Argonne National Laboratory. "TAPS History," in *TAPS Renewal Environmental Impact Statement*, http://tapseis.anl.gov.

minimal, only 10 compressor stations would be required, Mackenzie Delta gas would be tapped in addition to Alaska gas, and the total capacity would be 5.2 Bcf/d.[37]

While demand for natural gas has grown rapidly, especially for use in electric power generation, in recent years in the United States,[38] this has not led to a more general growth of profitable capacity in the large-diameter steel pipe industry. There are only a few large-diameter pipe producers now active in North America. Ipsco, Inc. was originally a Canadian company, which now has more of its assets in U.S. mills and its operational headquarters in Illinois. It has recently been profitable mainly because of a boom in western Canada oil and gas drilling, but its large-diameter pipe business has lagged.[39] Stelco, based in Hamilton, Ontario, is reorganizing under Canadian bankruptcy law. It has closed its Welland Pipe unit due to weak demand. Stelco reportedly still manufactures large-diameter pipe in a joint venture with Oregon Steel.[40] Oregon Steel is a minimill operator with a separate large-diameter pipe unit in Napa, California. But in 2003 the company indicated that its large-diameter pipe shipments fell by half in volume over the previous year and this was the primary reason that the company as a whole lost money.[41] Berg Steel Pipe, a subsidiary of Europipe, jointly owned by German and French steel interests, manufactures pipe in Panama City, Florida, and has been a large-diameter pipe supplier in North America for more than 25 years[42].

Many of these units are based on minimill operations, which in 2003 have faced much higher input costs. Not only have natural gas prices been higher, but prices for scrap, the main input for most minimills, were at record levels at the beginning of 2004.[43] Among the large integrated companies, U.S. Steel and Bethlehem Steel have both closed steel pipemaking operations in recent years, though both U.S. Steel and Bethlehem's successor, the International Steel Group (ISG), may be able to produce the plate size required for large-diameter pipe. U.S. Steel has not recently been a

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[37] Estimates and data from 2002 analyses supplied to AISI task force established on the Alaska Natural Gas Pipeline (provided on April 22, 2003).

[38] The report to President Bush on National Energy Policy in May 2001 indicated that natural gas electricity generation had already overtaken hydropower and other renewables in the 1990s and was projected to increase from 16% to 36% as a fuel source for U.S. electric power by 2020. National Energy Policy Development Group. *National Energy Policy* (May 2001), Fig. 5-5. But more recent EIA estimates state that the relative high and volatile price of natural gas since 2000 could serve to reduce demand below such projections. For example, it notes that, "Beyond the completion of plants currently under construction, little new [gas-fired] generating capacity is expected to be added before 2010;" see *DER*, "Four-Year Spike ..." (Dec. 17, 2003).

[39] *American Metal Market* (*AMM*), April 25, 2003.

[40] *AMM*, April 24, 2003.

[41] *AMM*, May 1, 2003.

[42] Information from their website at [http://www.bergpipe.com].

[43] Primarily because of strong export demand; see *AMM*, "Runaway Prices Rock the Melt Shop Floor," print ed. (Dec. 22, 2003).

major market force in plate and in 2003 agreed to trade its plate operation at Gary, Indiana, to ISG for a different type of operation in the same vicinity.[44]

U.S. steel industry sources expect that North American steel companies can and would make the investment, and provide the expertise necessary, to supply steel for an Alaska natural gas pipeline. President Andrew Sharkey of AISI, citing supply of steel for the Alliance pipeline in the letter to Senator Frank Murkowski quoted earlier as evidence of the industry's capabilities, stated that "North American steel and pipe industries stand ready to work with all other interested parties to arrive at the best pipeline design necessary to accomplish the objective." He further advocated that North American steel suppliers be fully included in the design of pipeline and be given an opportunity to compete for steel procurement.[45] The H.R. 6 conference report includes in Section 381 a "sense of Congress" resolution, by which the sponsors of the pipeline project are urged that they "should make every effort to use steel that is manufactured in North America."[46]

The ExxonMobil Pipeline Steel Project

An alternative to domestic pipe supply from currently available sources has been advanced by one of the three producers of Alaska oil and gas, the ExxonMobil Corporation. As mentioned above, ExxonMobil participated in a study with the other two producers, which concluded that a North Slope pipeline was not, at present, commercially feasible. The company, also as noted above, did not join the other producers in urging measures that would offset pipeline construction costs through gas price supports or other measures that ExxonMobil believes would distort the market price of natural gas in the North American market. ExxonMobil would instead address the cost problem through reducing federal and state regulatory uncertainties, a course it is pursuing in common with the other two producers. This includes securing changes in the federal permitting rules established under the 1976 law and securing assurances in the stability of state rules on royalties and fiscal treatment.[47] ExxonMobil also hopes to achieve substantial cost reductions by using innovative technology in building the pipeline.

In seeking to achieve such a technology breakthrough, ExxonMobil representatives on April 22, 2003, signed a letter of intent with two Japanese companies, Nippon Steel Corporation (NSC) and Mitsui & Co. Ltd., "to commercialize a jointly developed new steel, which is 20-50% stronger than

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[44] CRS Report RL31748, *The American Steel Industry: A Changing Profile*, p. 13.

[45] AISI letter and statement to Sen. Murkowski, April 17, 2002.

[46] H.R. 4, §714, as passed in the Senate, April 25, 2002; and H.R. 6, §12012, as passed in the House, April 11, 2003. Similar language is currently in S. 14, §144.

[47] Both of the latest versions of bills passed in Congress would replace the 1976 Alaska pipeline law with an expedited federal permitting procedure. At the state level, the companies are seeking a state royalty and fiscal regime that would be in place for a 5-7 year pipeline construction period; see, for example, ExxonMobil. "Governor of Alaska and Producers Meet to Discuss Natural Gas Pipelines," press release, March 28, 2003.

alternative pipeline steels in use today. The agreement includes possible upgrades to an NSC pipe mill." The announcement also noted that the formulation for the steel had first been developed in ExxonMobil Upstream Research laboratories, and that further work to make commercial production viable has already occurred jointly with Nippon Steel.[48] The technical announcement indicated that the new steel would be rated X100 and X120, grades that have hitherto not been manufactured anywhere.[49] Press commentary on the ExxonMobil announcement stated that pipe made from the new grade of steel would be lighter in weight, and therefore easier to handle – meaning significant potential reductions in construction costs. In addition to production and long-distance pipeline interests in Alaska and the Mackenzie Delta, ExxonMobil also has interests in a Sakhalin-Japan gas pipeline project and the west-east pipeline project being considered to bring gas from Central Asia to China.[50]

The ExxonMobil proposal for a technologically innovative grade of steel for pipeline construction apparently does not rely on U.S. (or Canadian) steel industry technology. The new rating of steel could be produced under license, although tooling and set-up costs would be substantial for multiple manufacturers working in different locations. But the required order for an Alaska gas pipeline (and a Mackenzie River pipeline, if one were built separately) may be so large as to require sharing of the work by multiple mills anyway.

Conclusion

If, how, when and where an Alaska natural gas pipeline will be built, and by whom, will depend on a complex set of factors, only some of which have been mentioned in this report. If a pipeline is constructed, estimates mentioned in this report indicate that it will be a major steel order, which could be significant for the North American steel industry. Of course, even were Congress to approve new pipeline legislation, any actual orders for steel mills would still be years away. The joint venture between ExxonMobil and the two Japanese companies appears to present an option that will guarantee a debate with respect to whose technology, and whose steel, would be used in this major project, should it go ahead.

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[48] ExxonMobil. "ExxonMobil Signs Letter of Intent with Nippon Steel and Mitsui & Co. Ltd. to Commercialize Advanced High Strength Steel," press release, April 22, 2003.

[49] Technical details are presented in *Proceedings of the Thirteenth (2003) International Offshore and Polar Engineering Conference*, vol. IV (2003), "Steel Development," at www.isope.org.

[50] *Oil Daily*, "Exxon Steel Deal Boosts ANS Gas Prospects," April 23, 2003.