The Alaska Natural Gas Pipeline: Background, Status, and Issues for Congress

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Summary

Constructing a natural gas pipeline from Alaska's North Slope to the lower-48 states has been a government priority—periodically—for more than four decades. Beginning with the Alaska Natural Gas Transportation Act of 1976, Congress has repeatedly affirmed a national need for an Alaska gas pipeline. In remarks to the press President Obama has likewise described an Alaska gas pipeline as "a project of great potential ... as part of a comprehensive energy strategy."

A key step in advancing the pipeline project was the inclusion of $18 billion in federal loan guarantees for such a pipeline in the Alaska Natural Gas Pipeline Act of 2004 (P.L. 108-324). More recent milestones were the State of Alaska's 2008 award to TransCanada Corporation (TransCanada) of a license to build a natural gas pipeline from Prudhoe Bay to the lower-48 states and the concurrent announcement of a competing pipeline proposal, the Denali project, by BP and ConocoPhillips. Through 2010, the Denali and TransCanada pipelines were proceeding along similar tracks. However, in May 2011, Denali's developers announced the discontinuation of their pipeline project due to insufficient customer support. TransCanada officials reportedly maintain that their project is still active and on pace to seek a pipeline certificate from FERC in 2012. Despite these assurances, some industry analysts are skeptical that the TransCanada pipeline could ultimately prove viable when the Denali pipeline did not.

Many potential obstacles to an Alaska gas pipeline remain at this time, especially the project's economics. Since passage of P.L. 108-324, the combination of new shale gas supplies and reduced growth in gas demand due to the recent U.S. economic downturn have caused natural gas prices to plummet. While demand for natural gas will likely rebound as the U.S. economy resumes its growth, independent gas producers assure strong lower-48 domestic natural gas supplies for the foreseeable future. The Energy Information Administration projects U.S. shale gas production will nearly triple from 2009 to 2035, continuing to put downward pressure on gas prices. In such a price environment, there are ongoing concerns as to the cost-effectiveness of an Alaska gas pipeline, with long-term pipeline economics a constantly moving target.

Proponents maintain that, if an Alaskan gas pipeline begins transporting gas to lower-48 markets by 2020 as its developers anticipate, it would result in reduced U.S. energy prices, increased energy security, and lower U.S. emissions of carbon dioxide. They assert that the project would also create a significant number of jobs and support regional economic development. Like other infrastructure projects in wilderness areas, however, an Alaska gas pipeline would also involve significant environmental costs, many of which have yet to be determined. Ultimately, the regional effects of any pipeline development on the Alaskan/Canadian environment must be weighed against its economic value, energy security value, and its global benefits in reducing carbon emissions from fossil fuels. To date, the judgment of Congress has favored construction of a pipeline—but ensuring that its public benefits continue to outweigh its costs will likely remain a key oversight challenge.

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Introduction

Over forty years ago, large natural gas reserves were discovered at Prudhoe Bay, Alaska. Since that time, Congress has been encouraging the development of those natural gas resources. Principal among its policies has been promoting the construction of a natural gas pipeline from the Alaska North Slope to the lower-48 states. Beginning with the Alaska Natural Gas Transportation Act of 1976,[1] and continuing through the Alaska Natural Gas Pipeline Act of 2004 (P.L. 108-324), Congress has repeatedly affirmed a national need for an Alaska natural gas pipeline.[2] The presidential administrations of Jimmy Carter, Ronald Reagan, and George W. Bush also supported an Alaska gas pipeline project. The Obama administration has also voiced support for such a pipeline. In remarks to the press during his first month in office, President Obama described an Alaska gas pipeline as "a project of great potential ... as part of a comprehensive energy strategy."[3]

While it has been on the drawing board for decades, on and off, interest in an Alaska natural gas pipeline revived in the early 2000s because of accelerated growth in U.S. natural gas demand, price volatility in the natural gas market, and the increased importation of liquefied natural gas (LNG) from overseas. Moreover, many analysts expected a national policy of carbon dioxide control, which could further increase natural gas demand for electric power generation and, possibly, transportation fuel. These factors led legislators to revisit the potential for an Alaska natural gas pipeline to meet future growth in U.S. demand for natural gas and to restart the process of Alaska gas pipeline development.[4] Important milestones in this activity were Alaska's August 2008 award to TransCanada Corporation (TransCanada) of a license to build a natural gas pipeline from Prudhoe Bay to the lower-48 states and the concurrent announcement of a competing pipeline proposal. To date, however, despite renewed support at both the federal and state levels, construction of an Alaska natural gas pipeline has not begun.

Issues for Congress

This report provides a brief review of the history of efforts to develop an Alaska natural gas pipeline, including project status, recent developments, and the current project outlook. It also discusses key policy issues related to the construction of the pipeline and its potential role in the context of U.S. energy and climate policy.[5] Specific issues of particular interest to Congress include the implications for U.S. energy supplies and energy prices of an Alaska gas pipeline, and proposed legislation to raise the federal loan guarantee for the pipeline's construction. Other issues include an Alaska gas pipeline's environmental impacts, its physical security, and its relationship to the proposed Mackenzie Valley pipeline in Canada.

[1] 15 U.S.C. § 719 et seq.

[2] For example, see P.L. 108-324 § 103(b)(2)(A) "a public need exists to construct and operate the proposed Alaska natural gas transportation project."

[3] Erika Bolstad, "Obama Calls Alaska Gas Pipeline Promising," *Anchorage Daily News*, February 11, 2009.

[4] U.S. Energy Information Administration, *Natural Gas Monthly*, August 2009, Table 2. Full initial pipeline capacity is 4.5 billion cubic feet per day.

[5] Portions of this report previously appeared in CRS Report RL34671, *The Alaska Natural Gas Pipeline: Status and Current Policy Issues*, by William F. Hederman.

Background

Arctic Alaska has substantial natural gas resources. The U.S. Geological Survey (USGS) has estimated that conventional natural gas reserves on Alaska's North Slope potentially exceed 100 trillion cubic feet (Tcf), over four times the total annual gas consumption of the United States.[6] The agency's assessment of undiscovered conventional gas resources across the entire Arctic region concluded that over 1,600 Tcf of additional natural gas reserves remains to be found, with a significant share located under U.S. territory.[7] The USGS has also estimated that the North Slope, specifically, may contain up to 158 Tcf of technically recoverable natural gas in the form of methane hydrates.[8] Although methane hydrate resources cannot yet be developed because there are no commercially viable methods to do so, future technologies may make such production economic. Taken together, these vast natural gas resources—both proven and anticipated—in Arctic Alaska have been the motivation for a natural gas pipeline to supply Alaskan natural gas to the lower-48 states.

In 1976, Congress passed the Alaska Natural Gas Transportation Act (ANGTA) to provide for sound decision-making on an Alaska Natural Gas Transportation System (ANGTS). The statute provided for congressional and presidential participation in the pipeline planning process and sought to expedite pipeline construction. The three main policy steps in the process were all completed by the end of 1977. First, the Federal Power Commission recommended (equally) two potential gas transportation options, both overland pipeline proposals along different routes through Alaska and Canada to the lower-48 states.[9] (A third, rejected, option was an overland pipeline across Alaska combined with an LNG export terminal in the port of Valdez.) President Carter then selected the route running along the Alaska Highway in preference to the northern route through the Mackenzie Delta, as shown in **Figure 1**. Congress approved the president's decision through a joint resolution on November 8, 1977.[10] This may have been the last time the project proceeded according to the original plan. A timeline including passage of ANGTS and other key events in the development of the Alaska gas pipeline project is presented in the **Appendix**.

Stalled Development

In the winter of 1977-1978, the United States experienced serious shortages of interstate natural gas supplies due to wellhead gas price controls imposed under a 1954 Supreme Court decision.[11] In response to these delivery problems, Congress passed the Natural Gas Policy Act of 1978 (NGPA), which effectively reversed the court's decision. Congress also passed the Powerplant and Industrial Fuel Use Act of 1978 (PIFUA), which restricted the construction of gas-fired power plants and the use of natural gas in large industrial boilers.[12] In the wake of these statutes

[6] David W. Houseknecht, U.S. Geological Survey, *Conventional Natural Gas Resource Potential, Alaska North Slope*, Open File Report 2004-1440, December 13, 2004; U.S. Energy Information Administration, *Annual Energy Outlook 2011*, DOE/EIA-0383(2011), April 2011, p. 141.

[7] U.S. Geological Survey, *USGS Arctic Oil and Gas Report*, Fact Sheet, July 2008.

[8] U.S. Geological Survey, *Gas Hydrate Resource Assessment: North Slope, Alaska*, Fact Sheet, October 2008

[9] The Federal Power Commission (FPC) was the predecessor of the Federal Energy Regulatory Commission (FERC).

[10] H.R. J. Res. 621, P.L. 95-158, 91 Stat. 1268, 95th Cong., 1st Sess., 1977.

[11] Phillips Petroleum Co. v. Wisconsin, 347 U.S. 672

[12] P.L. 95-62 and P.L. 95-620.

and related policies, a natural gas oversupply developed, causing natural gas prices to fall sharply and persistently. At the same time, in an often repeated pattern for major U.S. energy supply projects, cost estimates for the Alaska gas pipeline increased. As a result of these factors, the desirability of the Alaska natural gas transportation system declined.[13] Commercial attention to the Alaska gas pipeline initiative essentially disappeared by the mid-1980s.

Figure 1. Alaska Oil and Natural Gas Pipelines 2011

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

Although the full Alaska gas pipeline system made little progress, the southernmost parts of the project did get developed during this period to transport growing natural gas supplies from the Western Canadian sedimentary basin. Producers from Alberta, along with Canadian authorities and U.S. and Canadian pipeline companies, cooperated to pre-build the downstream legs of the ANGTS. The western leg of the ANGTS, paralleling the Pacific Gas Transmission pipeline, began service from Alberta to California in 1981. The eastern leg, the Northern Border Pipeline, went into service from Alberta to the Midwest in 1982 (**Figure 1**).

Marine Transport Options

In the 1980s, reacting to the lack of progress on the land-based pipeline system, the U.S. Maritime Administration authorized a study of marine options for transporting Alaskan natural gas as LNG aboard specialized tankers to determine whether they might offer U.S. shipbuilding opportunities. Such tankers had been transporting LNG to Japan from natural gas fields in south central Alaska (Cook Inlet) since 1969. The results of the study indicated roughly comparable economics for pipeline and LNG transport to the U.S. west coast. LNG sales to the Pacific Rim

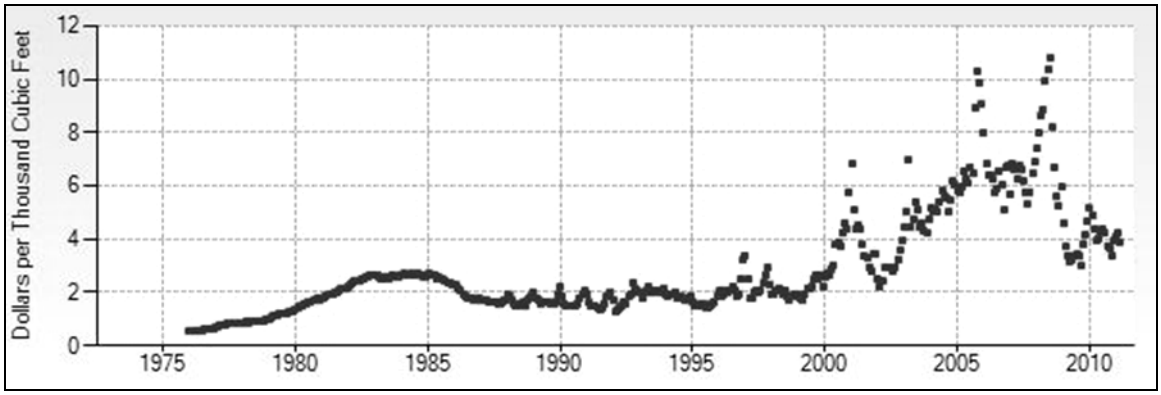
[13] See discussion in D. Fried and W. Hederman, "The Benefits of an Alaska Natural Gas Pipeline," *The Energy Journal*, Vol. 2, No. 1, January 1981, p. 22.

generally had greater economic potential, but were viewed as politically untenable because they would increase U.S. energy exports rather than increase domestic supplies.[14]

Renewed Interest in the Pipeline

Serious reconsideration of the construction of a natural gas pipeline from the Alaska North Slope began around 2000. This reconsideration was prompted, in large part, by tightening gas supplies to the lower-48 states and corresponding increases in natural gas prices and price volatility as shown in **Figure 2**.

Figure 2. Growth and Volatility in Monthly U.S. Natural Gas Prices



Source: U.S. Energy Information Administration, "U.S. Natural Gas Wellhead Price," Internet database, May 31, 2011, http://www.eia.gov/dnav/ng/hist/n9190us3m.htm. Prices are in nominal dollars.

One important sign of renewed interest in an Alaska pipeline was the recommendation in the 2001 *National Energy Policy* report that the administration "expedite the construction of a pipeline to deliver natural gas to the lower 48 states."[15] Nearly concurrent with the release of this report, President George W. Bush issued Executive Order 13212, which set forth the administration's policy that executive departments and other federal agencies act to expedite projects that would increase the production, transmission, or conservation of energy.[16] To this end a federal interagency task force was established in 2001, co-chaired by the Departments of Energy and State, to identify any impediment to processing an Alaska gas pipeline permit application and to recommend ways to streamline the process.[17]

In 2004, Congress passed the Alaska Natural Gas Pipeline Act (P.L. 108-324, Div. C), a key step in advancing the pipeline project. This act originated in broader national energy legislation that

[14] W. F. Hederman, "A Review of Marine Systems Use in Developing Alaska Natural Gas," SPE 11294, *SPE Hydrocarbon Economics and Evaluation Symposium*, March 2, 1983, Dallas, TX.

[15] National Energy Policy Development Group, *National Energy Policy*, Office of the Vice President, May 16, 2001, p. 7-18.

[16] E.O. 13212, "Actions to Expedite Energy-Related Projects," 66 F.R. 28357, signed by President Bush on May 18, 2001.

[17] U.S. Department of Energy, National Energy Technology Laboratory, *Delivering Alaskan North Slop Gas To Market*, June 2004, p. 8, http://www.netl.doe.gov/publications/factsheets/policy/Policy003.pdf. Other task force members included the Department of the Interior (Bureau of Land Management and Minerals Management Service), the Department of Transportation (Office of Pipeline Safety), and the Federal Energy Regulatory Commission.

was introduced in 2001, but advanced only slowly through Congress during 2002 and 2003. The Alaska provisions were eventually removed from the broader bill and enacted separately.[18] Among its key provisions, P.L. 108-324:

- clarified that, despite the passage of time since the earlier legislation, the Federal Energy Regulatory Commission (FERC) could still accept, review, and act upon applications for a new pipeline project under the Natural Gas Act or the Alaska Natural Gas Transportation Act;
- created an Office of the Federal Coordinator (OFC) for the issuance by other federal agencies of necessary pipeline permits;
- provided for a pipeline development loan guarantee of as much as $18 billion;
- established guidance for FERC to regulate the pipeline's capacity bidding process so that it would be available to parties beyond the three major North Slope producers—thereby promoting competition in Alaska North Slope natural gas development.[19]

The American Jobs Creation Act of 2004 (P.L. 108-357 § 706) provided a 7-year cost-of-investment recovery period for tax purposes (instead of the previously allowed 15-year period) and a designated economic life (class life) of 22 years for the Alaska natural gas pipeline. These provisions were intended by Congress to reduce the cost of capital for the project.[20] The act also provided a tax credit for a North Slope natural gas treatment plant required for the pipeline's operation. Broader, national energy legislation, which passed in 2005 (Energy Policy Act of 2005, P.L. 109-58), also addressed the Alaska natural gas pipeline. P.L. 109-58 required FERC to submit to Congress on a semi-annual basis progress reports about licensing and building the pipeline (§ 1810).[21] In June 2006, consistent with P.L. 108-324 and in accordance with E.O. 3212, fifteen federal agencies with regulatory and other responsibilities related to an Alaska natural gas pipeline signed a memorandum of understanding "to use best efforts to achieve early coordination and compliance with deadlines and procedures established by relevant agencies" in support of the pipeline's development.[22]

Alaska Gasline Inducement Act (AGIA)

In 2007, Alaska passed the Alaska Gasline Inducement Act (AGIA), seeking to encourage expedited construction of a natural gas pipeline from Alaska's North Slope to gas markets in Alaska and the lower-48 states.[23] AGIA requires a pipeline developer to meet certain requirements advancing the project in exchange for a license providing up to $500 million in matching funds, thereby reducing the developer's financial risks. Among other provisions, the statute requires a

[18] State of Alaska, Department of Revenue, *The Alaska Natural Gas Pipeline Act of 2004*, undated, p. 1, http://www.revenue.state.ak.us/gasline/Annex%201.pdf

[19] The FERC issued a final rule on the open season matter on February 9, 2005 (FERC Order No. 2005).

[20] U.S. Congress, Joint Committee on Taxation, *General Explanation Of Tax Legislation Enacted In The 108th Congress*, Joint committee print, JCS-5-05, May 2005, p. 330.

[21] P.L. 109-58, 119 Stat. 594(2005), 42 U.S.C. Section 15801 *et seq*.

[22] U.S. Dept. of Agriculture, et al. ,*Memorandum of Understanding Related to an Alaska Natural Gas Transportation Project*, June 2006, p. 3, http://www.usace.army.mil/CECW/Documents/cecwo/reg/mou/Alaska_MOU.PDF.

[23] AS 43.90 et seq.

developer's commitment to: apply by a specific date for key regulatory approvals, to hold an open season for soliciting bids from North Slope gas producers for future shipments on the pipeline, and to expand the pipeline on rate and tariff terms that would allow gas producers to fully develop Alaska's North Slope natural gas resources.[24] The AGIA also establishes a competitive, public process for the evaluation and selection of pipeline proposals under specific criteria.

Alaska Gas Pipeline Proposals

Developers have proposed seven major pipeline projects to develop North Slope natural gas reserves since 2007. Five of these proposals were filed under the AGIA process. Two have been proposed outside that process.

AGIA Proposals

In July 2007, the State of Alaska issued a Request for Applications (RFA) seeking proposals from any interested developer willing to meet the AGIA requirements. The state received competing applications from five developers:

- **TransCanada Pipelines Ltd. (TransCanada)** and Foothills Pipe Lines, Ltd., proposed a pipeline along a route similar to the ANGTS route for the originally approved project. The pipeline would connect with the existing TransCanada Alberta network at the Alberta hub. TransCanada would not construct a North Slope gas treatment plant to process wellhead gas for pipeline transport, although the company stated a willingness to develop such a plant if necessary. The original capacity of this pipeline would be between 4.5 to 5.0 billion cubic feet per day (Bcf/d). According to FERC staff, it would be expandable to 5.9 Bcf/d through the use of greater compression only, and, therefore, at relatively low added cost. [25] ExxonMobil, one of the three major Prudhoe Bay natural gas producers, joined with TransCanada to develop this project in June 2009.[26] The project anticipates an in-service date of 2018.
- **Alaska Gasline Port Authority (AGPA),** a municipal entity (including the City of Valdez, Fairbanks North Star Borough, and North Slope Borough), proposed a pipeline from the North Slope to Valdez, where the gas could be liquefied and shipped as LNG to Asia, the West Coast of the United States, Mexico, or Hawaii. The "All Alaska Gasline/LNG Project" would be constructed and operated by private contractors but publicly financed.
- **Alaska Natural Gasline Development Authority (ANGDA)** proposed a smaller capacity lateral pipeline to link from whatever major North Slope pipeline was

[24]State of Alaska, "Frequently Asked Questions Regarding the Alaska Gasline Inducement Act ("AGIA") and the AGIA Process," November 8, 2008, p. 1, http://www.gov.state.ak.us/agia/agia_faqs_11808.pdf.

[25] Federal Energy Regulatory Commission, *Sixth Report to Congress on Progress Made in Licensing and Constructing the Alaska Gas Pipeline*, August 29, 2008, p. 8.

[26]TransCanada Corp., "TransCanada and ExxonMobil to Work Together on Alaska Pipeline Project," Press release, June 11, 2009.

selected to South Central Alaska (Anchorage and other locations), making up for declining production there.

- A **China Petroleum and Chemical Corporation (Sinopec)** subsidiary and Little Susitna Construction Company proposed a pipeline from the North Slope to Valdez in the south where the gas would be liquefied and exported to the Pacific Rim as LNG.
- **AEnergia LLC**, a startup company formed by persons with large project engineering experience, proposed a North Slope-to-Alberta pipeline jointly owned by the producers (74%), the State of Alaska (25%), and AEnergia (1%).[27]

Of these applications, former Alaska Governor Sarah Palin determined that only TransCanada's met the AGIA requirements and was complete enough to be evaluated. In May 2008, the governor recommended the TransCanada proposal to the state legislature. The legislature accepted this recommendation and voted to award TransCanada the AGIA license in August 2008.[28] The Sinopec and AEnergia proposals subsequently were not pursued; the other three proposals are still active.

Other Proposals

In addition to the proposals filed under Alaska's AGIA process, developers made two alternative proposals to construct North Slope gas pipelines or otherwise bring North Slope natural gas to market.

- **BP and Conoco Philips (Denali)**, two of the three major Prudhoe Bay natural gas producers, jointly proposed a 4.0 Bcf/d pipeline project outside the AGIA process (and, thus, ineligible for the $500 million in state funds). The BP-Conoco Philips "Denali" Pipeline would follow a route similar to that of the TransCanada project to the Alberta hub. The Denali project, however, would include a gas treatment facility and would consider the option of new pipelines through Alberta and to the lower-48 states if deemed necessary. [29] The project schedule proposed initial pipeline service in 2018.[30]
- **Enstar Natural Gas Company** proposed a 690-mile smaller capacity (0.5 Bcf/d) "bullet" pipeline from the North Slope to South-central Alaska as an alternative to the ANGDA lateral pipeline proposal. The Enstar pipeline would not depend upon the construction of a larger Alaska natural gas pipeline (either TransCanada's or Denali) to supply natural gas to in-state markets.[31]
- **Alaska Natural Resources To Liquids, LLC** was one of several "gas-to-liquids" (GTL) proposals that would convert North Slope natural gas to liquid hydrocarbon fuels (e.g., diesel and gasoline) and then transport them via a new

[27] Federal Energy Regulatory Commission, *Fifth Report to Congress on Progress Made in Licensing and Constructing the Alaska Gas Pipeline*, February 19, 2008, pp. 2-3.

[28] Alaska HB 3001, August 1, 2008.

[29] BP and ConocoPhillips, "BP and ConocoPhillips Join on the Alaska Gas Pipeline," Joint press release, April 8, 2008.

[30] BP and ConocoPhillips, "Denali - The Alaska Gas Pipeline Project," Web page, October 15, 2009, http://www.denalipipeline.com/overview.php.

[31] Fairbanks Economic Development Corp., *In-State Gas Pipeline Supply Options Study*, February 5, 2009, p. 39.

pipeline or through the existing Trans Alaska Pipeline System (**Figure 1**) to Valdez for marine shipment out of state.[32] While not intended to deliver natural gas to the lower-48 states, such a project would develop Alaska's North Slope gas reserves as an alternative to a natural gas pipeline.

According to trade press accounts, despite the support of some in Congress, there are currently no active GTL project proposals for the North Slope, and the economic and technical challenges make such a project unlikely.[33] Of the other Alaska natural gas pipeline projects, only the TransCanada, Denali, and AGPA proposals would transport natural gas out of Alaska. The ANGDA and Enstar proposals involve smaller projects focused exclusively on natural gas supplies to markets within Alaska. Because the latter two proposals are of more state interest than national interest, they are not discussed further in this report.

Project Economics

An Alaska gas pipeline or pipeline/LNG terminal combination transporting natural gas from the North Slope to the lower-48 states would be, by some measures, the largest civilian construction project in the history of North America. When initially announced, the TransCanada and Denali pipeline developers estimated total project costs of $27 billion[34] and $30 billion,[35] respectively. The Energy Information Administration has assumed total capital costs for a TransCanada or Denali-type pipeline of approximately $28.8 billion and capital costs for a pipeline/LNG project of approximately $35.4 billion.[36] In light of these enormous capital requirements, policy makers and investors alike have paid close attention to key factors affecting the economic viability of the proposed projects, as well as their potential impact on regional and national economic development.

Natural Gas Price Expectations

Future prices of natural gas will have the greatest influence, by far, on the cost effectiveness of an Alaska natural gas pipeline. According to a 2008 study prepared for the Alaska legislature, the net present value of the TransCanada pipeline would be positive with long-term real natural gas prices above $5.00 per thousand cubic feet (Mcf) and potentially at lower prices.[37] A federal tax credit for the pipeline proposed in 2002 under H.R. 4 implied economic viability of the project at

[32] Alaska Natural Resources To Liquids, LLC, "A Legacy Decision for Alaska," Presentation to the Alaska State Legislature, Joint Legislative Budget and Audit Committee, June 20, 2008; Tim Bradner, "Natural Gas: Exxon, BP, Independent All Planning Gas-To-Liquids Projects," *Alaska Journal of Commerce*, April 16, 2000.

[33] "Senator Calls for GTL Plant to Prop Up TAPS Pipeline Volumes," *BMI Americas Oil and Gas Insights*, April 1, 2011.

[34] TransCanada Corp., *Application for License: Alaska Gasline Inducement Act*, November 30, 2007, p. 2.5-2. 2007 dollars.

[35] Wesley Loy, "BP, Conoco Join Forces to Pursue Gas Pipeline," *Anchorage Daily News*, April 9, 2008. 2008 dollars.

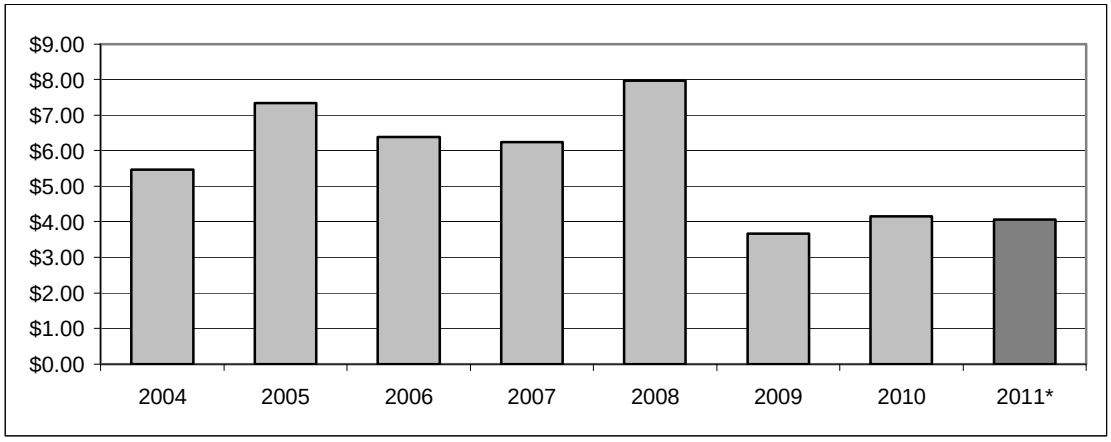
[36] U.S. Energy Information Administration, March 2009, p. 39. Costs are adjusted to 2009 dollars. A gas-to-liquids option is assumed to have capital costs of approximately $60 billion.

[37] Black & Veatch, *Net Present Value (NPV) Analysis*, Presentation to the Alaska State Legislature, Joint Legislative Budget and Audit Committee, June 18, 2008, p. 18, http://lba.legis.state.ak.us/proposals/doclog/2008-06-18black_veatch_npv_spec_sess_jnt_comm.pdf.

a gas price of approximately $4.00/Mcf (in 2011 dollars).[38] By comparison, the EIA's most recent analysis projects lower-48 wellhead natural gas prices to rise from $4.09/Mcf in 2011 to $5.81/Mcf in 2030.[39] Based on such projections, assuming adequate gas production from North Slope fields, TransCanada's project would be marginally cost-effective. Assuming similar economics, the Denali project would also likely be marginally cost-effective.

Figure 3. Annual Average U.S. Wellhead Natural Gas Prices

(Nominal dollars per thousand cubic feet)



Source: U.S. Energy Information Administration, "U.S. Natural Gas Wellhead Price," Internet database, October 20, 2009, http://tonto.eia.doe.gov/dnav/ng/hist/n9190us3M.htm.

*2011 value is January-March average.

Although the EIA's forecast of natural gas prices could potentially support the construction of an Alaska gas pipeline, such forecasts are dynamic and can change unexpectedly due to structural changes in natural gas markets, changes in regulation, and general economic conditions. For example, when Congress passed the Alaska Natural Gas Pipeline Act of 2004, the average annual price for U.S. wellhead natural gas was $5.46/Mcf and rising (**Figure 3**). Four years later, in 2008, the average annual gas price increased to $8.07/Mcf. This high price level, however, spurred unexpected growth in the production of "unconventional" natural gas from shale deposits in the lower 48-states.[40] The combination of new shale gas supplies and reduced growth in gas demand due to the recent U.S. economic downturn subsequently caused natural gas prices to plummet. For the first three months of 2011, wellhead natural gas prices averaged $4.07/Mcf. While demand for natural gas will likely rebound as the U.S. economy resumes its growth, independent gas producers assure strong lower-48 domestic natural gas supplies for the foreseeable future. The EIS projects U.S. shale gas production will nearly triple from 2009 to

[38] H.R. 4, Energy Policy Act of 2002, Engrossed Amendment as Agreed to by Senate, Section 2503. The provision was not enacted.

[39] U.S. Energy Information Administration, *Annual Energy Outlook 2011*, DOE/EIA-0383(2011), Reference case tables, "Natural Gas Supply, Disposition, and Prices, Reference case," April 26, 2011, p. 44, http://www.eia.gov/oiaf/aeo/tablebrowser/#release=AEO2011&subject=0-AEO2011&table=13-AEO2011&region=0-0&cases=ref2011-d020911a. Prices are in 2009 dollars.

[40] U.S. Energy Information Administration, *Is U.S. Natural Gas Production Increasing?*, Energy Brief, June 11, 2008, http://tonto.eia.doe.gov/energy_in_brief/natural_gas_production.cfm.

2035, continuing to put downward pressure on gas prices.[41] In such a price environment, there are ongoing concerns as to the cost-effectiveness of an Alaska gas pipeline, with long-term pipeline economics a constantly moving target. Nonetheless, Alaska state officials reportedly stated in 2009 that, notwithstanding unprecedented shale gas development across North America, the outlook for the pipeline was "extremely healthy from an economic standpoint."[42] The state's Alaska Pipeline Project Report, released in October 2009, likewise stated that "the temporary weakness of North American natural gas demand is not a determining factor in establishing the economic viability of an Alaska natural gas pipeline."[43]

Construction Costs and Cost Uncertainties

TransCanada and Denali estimated similar costs for their proposed projects—between $28 billion and $30 billion. Some analysts, however, have suggested that these estimates are conservative and that project costs could reach $40 billion.[44] Infrastructure analysts point to numerous examples of cost overruns for other recent multi-billion dollar, decade-long transportation projects, such as Boston's "Big Dig" Central Artery/Tunnel Project, the English Channel Tunnel, and the Oresund Bridge from Denmark to Sweden.[45] They conclude that "large construction cost escalations in transport infrastructure projects are common and exist across different project types, different continents, and different historical periods."[46] While the TransCanada and Denali pipeline developers have claimed extensive experience managing the construction of major pipeline projects within budget, the scale of an Alaska gas pipeline would be unprecedented, and the risk of cost overruns might be significant. Projected costs for a similar but smaller Arctic natural gas pipeline proposal, the Mackenzie Valley Pipeline (further discussed below), which is also still in development, reportedly doubled between 2005 and 2007.[47]

Economic Development

The Alaska natural gas pipeline project has important implications for Alaska's economy. By one estimate commissioned by the state in 2006, the net present value of state and local government earnings from the project, including associated North Slope natural gas production, could exceed $29 billion over its lifetime.[48] New natural gas royalty revenue could offset future declines in ongoing oil royalties from mature North Slope oil fields, which have accounted for 85% of the state's unrestricted general fund, on average, since the Trans Alaska Pipeline System began

[41] U.S. Energy Information Administration, *Annual Energy Outlook 2011,* April 26, 2011, p. 37.

[42] Rena Delbridge, "State Sticks by Pipeline Deal," *Alaska Dispatch*, October 26, 2009.

[43] Alaska Dept. of Revenue and Dept. of Natural Resource, *Alaska Pipeline Project Report: Licensed under the Alaska Gasline Inducement Act (AGIA),* October 31, 2009. p. 21.

[44] Tim Bradner, "Wobbly Market May Crimp Gas Line," *Alaska Journal of Commerce*, February 2, 2009.

[45] A. E. Barinov, "Systemic and Political Factors Affecting Cost Overrun in the World Economy's Large Investment Projects," *Studies on Russian Economic Development*, Vol. 18, No. 6, 2007, pp. 650–658.

[46] Bent Flyvbjerg, Mette K. Skamris Holm And Søren L. Buhl, "What Causes Cost Overrun in Transport Infrastructure Projects?," *Transport Reviews*, Vol. 24, No. 1, January 2004, p. 16.

[47] "Former Canadian Official: State Gas Line Faces Numerous Hurdles," *Associated Press*, April 15, 2008.

[48] Information Insights, Inc., *Economic, Fiscal and Workforce Impacts of Alaska Natural Gas Projects*, Prepared for Alaska Department of Revenue, May 10, 2006, p. 8. Adjusted to 2009 dollars.

operation.[49] Although state oil revenues set a record in FY2009 due to high global oil prices, oil production in Alaska has actually declined 63% from its peak in 1988.[50]

Development of an Alaska natural gas pipeline to the lower-48 states would also create many new jobs. The Alaska-commissioned analysis concluded in 2006 that the pipeline

> increases the state's labor force needs by an average of 18,000 direct, indirect and induced workers per year during construction. The project also creates a sustained impact of about 26,000 jobs per year after construction from both pipeline operations and jobs generated by state and local spending of project-related oil and gas revenue.[51]

Throughout the nation, numerous additional jobs would be created in support of, or resulting from, the pipeline's construction. According to one estimate cited in 2004 by Senator Lisa Murkowski, up to 1.1 million jobs nationwide could be created—directly and indirectly—by the pipeline, although details of this analysis are not publicly available.[52] A different analysis of public infrastructure spending reported that 21,888 total jobs are created for every $1 billion in new investment in natural gas projects.[53] Based on this ratio, a $28 billion Alaska gas pipeline would create approximately 600,000 new jobs, including jobs in Canada. These jobs include those directly involved in constructing the new project, supplying the project (e.g., line pipe, construction equipment), and induced by the general spending of new pipeline-related employees. Projections of new jobs are highly uncertain, however, particularly for a project as unique as an Alaska gas pipeline, so the actual number of jobs to be created remains somewhat speculative.

In addition to job creation, the presence of a major interstate pipeline from the North Slope to the lower-48 could change the economics of many local energy markets within Alaska. For example, both TransCanada and Denali agreed to provide up to five natural gas delivery points within Alaska, which could allow local communities near the pipeline right-of-way to provide new natural gas service. Delivery to Anchorage and other South-central Alaska markets could also offset declining natural gas supplies from gas fields at Cook Inlet. New or sustained supplies of natural gas to these communities would be an important factor in their economic health.

Current Project Status

Because the pipeline/LNG proposals for transporting natural gas out of Alaska would involve interstate commerce, they are subject to federal siting approval by FERC under the Natural Gas Act of 1938.[54] Additional state and local approvals for aspects of the project would be required, as

[49] Resource Development Council for Alaska, Inc., "Alaska's Oil and Gas Industry," Web page, June 2, 2011, http://www.akrdc.org/issues/oilgas/overview.html#Anchor-Facts-51540.

[50] Ibid.

[51] Information Insights, Inc., May 10, 2006, p. 82.

[52] U.S. Congress, House Committee on Energy and Commerce, Subcommittee on Energy and Air Quality, May 6, 2004, p. 10.

[53] Political Economy Research Institute, How Infrastructure Investments Support the U.S. Economy: Employment, Productivity and Growth, January, 2009, p. 25.

[54] Section 7 of the Natural Gas Act authorizes FERC to issue certificates of "public convenience and necessity" for "the construction or extension of any facilities ... for the transportation in interstate commerce of natural gas" (15 U.S.C. § 717f).

well as approvals from Canadian federal, territorial, provincial, and First Nation agencies for the sections of the project running through Canada.

Through 2010, the Denali and TransCanada pipelines (only one of which could be constructed) were proceeding along similar tracks. Both had initiated FERC's pre-filing process, whereby prospective pipeline developers engage with stakeholders—including state, local, and other federal agencies—before filing an application for a Natural Gas Act 7(c) pipeline certificate. Although Denali began the pre-filing process in June 2008, and TransCanada in April 2009, both projects conducted open seasons in 2010 soliciting commitments for future gas shipments. If the open seasons yielded sufficient interest from gas shippers, either the Denali or TransCanada project could file pipeline siting applications with FERC, Canada's National Energy Board, and other agencies. However, in May 2011, Denali's developers announced the discontinuation of their pipeline project "because of a lack of customer support."[55] TransCanada officials reportedly maintain that their project "has made good progress on commercial negotiations with customers" and is on pace to seek a pipeline certificate from FERC in 2012.[56] Despite these assurances, some industry analysts are skeptical that the TransCanada pipeline could ultimately prove viable when the Denali pipeline did not.[57] Based on TransCanada's original development schedule, its pipeline project, if it proceeds, could be in service by approximately 2020.[58] EIA's most recent scenarios in which the pipeline is constructed project in-service dates between 2026 and 2030.[59]

The TransCanada and Denali pipeline projects had been competing and mutually exclusive proposals, each backed by different North Slope producers. To reduce project costs and improve the likelihood of success, some key policy makers had been encouraging the various developers to come together on a single pipeline project. For example, Alaska Governor Sean Parnell stated in 2009, "Four major, international companies all working on an Alaska gas line. To me, that's good news. Now the challenge is to get them working on the same project."[60] Given that the Denali project has been terminated, producer cooperation on TransCanada's pipeline may now be a greater possibility. Whether BP and Conoco Philips, having discontinued their Denali project, would seek to join Exxon in the TransCanada project, is an open question.

The LNG Option

The AGPA proposal to build a pipeline from the North Slope to Valdez, and then ship out natural gas on LNG tankers, has not advanced to the detailed planning and project development stage. However, TransCanada committed to including the option of transporting natural gas for the AGPA's proposed LNG project within its open season for its mainline pipeline from the North Slope to Alberta.[61] According to remarks to Alaska legislators in June 2009, TransCanada saw "serious interest" among potential shippers for an LNG alternative to its all-land pipeline

[55] Denali—The Alaska Gas Pipeline, LLC., "Denali Discontinues Gas Pipeline Project," Press release, May 17, 2011.

[56] Bill McAllister, "TransCanada Responds to Denali Project Folding," KTVA CBS 11 News, Alaska, May 19, 2011.

[57] Cassandra Sweet, "TransCanada Sticks to Alaska Gas Pipeline Project Even as Rival Bows Out," *Wall Street Journal*, May 17, 2011; Andrew Halcro, "Denali's Demise Doesn't Bode Well For State-Backed Gas Pipeline," *Alaska Dispatch*, May 18, 2011.

[58] U.S. Energy Information Administration, March 2009, p. 77.

[59] U.S. Energy Information Administration, April 26, 2011, p. 40.

[60] Stefan Milkowski, "Parnell Chamber Talk Focuses on Energy," *Petroleum News*, Vol. 14, No. 40, October 4, 2009.

[61] Federal Energy Regulatory Commission, *Eighth Report to Congress on Progress Made in Licensing and Constructing the Alaska Gas Pipeline*, August 26, 2009, p. 6.

proposal.[62] Interest in advancing the LNG project further increased after September 2009, when the AGPA's general counsel, Bill Walker, declared his candidacy for the Alaska governorship with the AGPA gas pipeline/LNG project as the primary issue in his campaign.[63] Concerns about the economic viability of the TransCanada pipeline also cast doubt on the viability an LNG alternative project, however, so the likelihood of such a project remains unclear.

Policy Issues for Congress

Congress's last major action to promote an Alaska gas pipeline was passing the Alaska Natural Gas Pipeline Act in 2004. Under that federal statutory framework, as well as provisions in Alaska state law, the TransCanada pipeline project is said to be proceeding on schedule. Since 2004, Congress has been monitoring progress on pipeline development, with only a few legislative proposals directly addressing these projects (further discussed below). As Congress continues to oversee Alaska gas pipeline activities, several policy issues may attract particular attention. The most important of these is continued uncertainty about whether an Alaska gas pipeline will ultimately be constructed—and, if not, the broader implications for U.S. energy supplies and energy prices. Other important issues are Canada's development of a Mackenzie Valley Pipeline, the federal loan guarantee for the Alaskan pipeline's construction, the environmental impact of the project, and its physical vulnerability to acts of terrorism.

Alaska Gas Pipeline Development Uncertainty

Many policy makers and developers have had high expectations for the contribution of an Alaska natural gas pipeline to U.S. energy supplies. But given the scale, investment requirements, and 10-year time frame required to construct such a pipeline, there continues to be uncertainty regarding its completion. As discussed above, the project faces specific risks deriving from gas prices and pipeline construction costs—but it also faces significant risks involving natural gas production costs, environmental impacts, interest rates, tax policies, and regulatory uncertainty. If, through some combination of these factors, the pipeline's development stalls (again), it may have a ripple effect on the U.S. energy sector and the broader economy. For example, a large quantity of Alaskan natural gas could help to moderate growth and volatility of natural gas prices in the lower-48 states. Without such supplies, the U.S. market could be more exposed to unanticipated disruptions in shale gas supplies or, in some regions, imported LNG—which has a history of price volatility in the international market. Not having Alaskan natural gas supplies might also make it more difficult or costly to reach U.S. carbon reduction targets by substituting cleaner natural gas for other fossil fuels in power generation or motor vehicles.[64]

Canada's Mackenzie Valley Pipeline

Because large sections of a proposed Alaska natural gas pipeline to the lower-48 states would pass through Canada, the involvement of Canadian agencies is essential for the pipeline's success.

[62] Tony Palmer, Vice President, TransCanada Corp., Testimony before the Alaska House Resources Committee, June 23, 2009.

[63] Bill Walker, All-Alaska Governor, Web page, October 15, 2009, http://www.billwalkerforgovernor.com.

[64] For further discussion and analysis of U.S. greenhouse gas policy, see CRS Report RL34513, *Climate Change: Current Issues and Policy Tools*, by Jane A. Leggett.

Canada has cooperated with the United States for decades on a variety of general matters related to the development of an Alaska natural gas pipeline (e.g., the pre-build segments in the early 1980s). However, Canada has been pursuing its own Arctic natural gas projects as well. The Canadian project of greatest importance, which could affect an Alaska natural gas pipeline project, is the development of a Mackenzie Valley pipeline.

The Mackenzie River Delta region in the Canadian Arctic contains an estimated 40 Tcf of natural gas.[65] The Canadian government has been interested in developing a pipeline to transport this natural gas to North American markets since it was first discovered in the 1970s in a process that has, in many ways, paralleled the Alaska gas pipeline's development. The main proposal has been a new pipeline from the delta through the Mackenzie River Valley to the existing natural gas pipeline network in Alberta, as illustrated earlier in **Figure 1**. Initially, developers also proposed transporting North Slope gas through a spur pipeline connecting to the proposed Mackenzie pipeline, but the Alaskan connection was rejected by a Canadian government inquiry report in 1974, three years before President Carter also rejected this option.[66] The current configuration of a stand-alone pipeline to Alberta is similar in design to the Alaska gas pipeline proposals, albeit smaller in capacity (1.2 Bcfd) and lower in cost ($15 billion) with a projected in-service date of 2016.[67]

Although there has been significant activity to advance the development of the Mackenzie Valley Pipeline, the project has been controversial due to environmental impacts and escalating costs.[68] According to press reports in October 2009, the Canadian government appeared to be reconsidering the level of financial support it planned to provide the project due to "concerns about the project's price tag."[69] The pipeline's developers maintained that it remained viable, however, and the project continued to receive government support as they proceeded with project groundwork and meeting regulatory requirements.[70] In March 2011, Canadian authorities provisionally approved the Mackenzie pipeline project, although some analysts believe it may not be constructed without new government subsidies for the same reasons the Denali project was cancelled.[71]

Because the Mackenzie Valley pipeline would commercialize a major new source of North American natural gas, and would draw on a limited pool of construction resources and materials available for such a project, it has been viewed by some as a direct competitor to an Alaska gas pipeline.[72] For example, the demand for steel and pipe for a Mackenzie Valley project would be significant, and it is not clear that there is adequate, large diameter pipe production capacity in the

[65] U.S. Geological Survey, "Assessment of Undiscovered Oil and Gas Resources of the Mackenzie Delta Province, North America, 2004," Fact Sheet 2006-3002, March, 2006.

[66] Thomas R. Berger, Commissioner, *Northern Frontier, Northern Homeland: The Report of the Mackenzie Valley Pipeline Inquiry, Volume One*, Ministry of Supply and Services Canada, April 15, 1977, p. xiii.

[67] Federal Energy Regulatory Commission, *Seventh Report to Congress on Progress Made in Licensing and Constructing the Alaska Gas Pipeline*, February 20, 2009, p. 6.

[68] Claudia Cattaneo, "Little Hope in the Pipeline," *Financial Post*, July 1, 2009.

[69] John Ivison and Carrie Tait, "Pipeline Dream in Peril," *National Post*, October 27, 2009.

[70] Jeffrey Jones, "Imperial Oil CEO 'Dismayed' by Mackenzie Report," *Reuters*, November 3, 2009.

[71] National Energy Board (Canada), "National Energy Board Issues Certificate of Public Convenience and Necessity for Mackenzie Valley Pipeline," Press release, Calgary, AB, March 10, 2011; "Mackenzie Pipeline Needs Federal Cash: Insiders," CBC News, January 12, 2011.

[72] See, for example: James Irwin, "Alaska Pipeline Advance Could Threaten Mackenzie Valley Pipeline," *Natural Gas Week*, March, 7, 2005.

entire world to supply both Alaska and Mackenzie Valley projects at the same time. While the future of natural gas prices and the availability of construction commodities is difficult to predict, because of their physical similarities and links to the same infrastructure, the fates of the Mackenzie and Alaska gas pipelines may remain intertwined.

Federal Loan Guarantee

As mentioned above, to reduce the financial risks associated with the development of an Alaska natural gas pipeline, the Alaska Natural Gas Pipeline Act of 2004 authorizes the Department of Energy (DOE) to issue up to $18 billion of project loan guarantees for up to 80% of its capital costs and a term of 30 years. The Consolidated Appropriations Act of 2005 (P.L. 108-447) extended the availability of loan guarantees to developers of an LNG project, such as that proposed by AGPA, that would transport natural gas from South-central Alaska to West Coast States.[73] DOE solicited comments and information from the public in 2005 in advance of a possible rulemaking concerning the loan guarantee provisions, but has not issued such rules.[74]

Federal loan guarantees for an Alaska natural gas pipeline have been controversial because they are viewed by some stakeholders, especially supporters of Mackenzie Pipeline development, as an unfair form of subsidy.[75] They also expose the federal government to a significant portion of the financial risk associated with the project. The Congressional Budget Office estimated in 2003 that the loan guarantee under P.L. 108-324 would involve a 10% subsidy and cost $2 billion over the 2010-2013 period, although the agency acknowledged that this estimate was "quite uncertain."[76] Some in Congress have called for greater federal loan guarantees for an Alaska gas pipeline. Responding to the recent fall in natural gas prices and tighter credit markets in the wake of the U.S. banking crisis, Senators Bingaman and Murkowski included provisions in the American Clean Energy Leadership Act of 2009 (S. 1462) that would have raised the limit from $18 billion to $30 billion (§ 353), among other provisions. The bill was not enacted, however, and there have been no similar legislative proposals to date in the 112th Congress.

Environmental Impacts

The addition of significant natural gas resources from Alaska's North Slope to the lower-48 states' fuel supplies would be considered by many policy makers to be environmentally beneficial because natural gas produces much lower atmospheric emissions than other fossil fuels (although still far more than renewables, nuclear power, and conservation). Nonetheless the immensity of the roughly 1,750-mile construction project and associated development of North Slope natural gas fields has caused concern about potential environmental effects on land and wildlife. These concerns were heightened by the 2006 shutdown of North Slope oil fields following the discovery of severe corrosion and a small spill from one of BP's Prudhoe Bay oil pipelines.[77] Broader

[73] Title I, Division J § 114.

[74] U.S. Department of Energy, "Alaska Natural Gas Pipeline Loan Guarantee," 70 *Federal Register* 30707-30708, May 27, 2005.

[75] Stephen Barlas, "Energy Bill Likely to Bless Alaska NG Pipeline," *Pipeline & Gas Journal*, November 2002; "U.S. Loan Guarantees for Alaska Pipeline Worry Mackenzie Line Supporters," *CBC News*, May 27, 2009.

[76] Congressional Budget Office, *S. 14 Energy Policy Act of 2003, As Introduced on April 30, 2003*, Cost Estimate, May 7, 2003, p. 7, http://www.cbo.gov/doc.cfm?index=4206&type=0.

[77] For further background see archived CRS Report RL33629, *BP Alaska North Slope Pipeline Shutdowns: Regulatory* (continued...)

environmental impacts from existing North Slope oil development and the associated TAPS pipeline have been significant and are well-documented.[78]

Congress has addressed the direct environmental effects of Alaska gas pipeline development by designating FERC as the lead federal agency in preparing an environmental impact statement under the National Environmental Policy Act of 1969 (P.L. 91-190). Under this statute, pipeline permit applicants must prepare certain environmental reports to aid FERC in its preparation of the environmental impact statement (18 C.F.R. § 380.3). The Environmental Protection Agency, as a supporting agency, often assists in the review of the environmental reports and the issuance of the environmental impact statements. In some cases, however, FERC's environmental reviews of major natural gas projects have been challenged in the courts.[79] Given the scale and uniqueness of an Alaska gas pipeline project, future environmental controversies may arise.

One specific environmental issue that faces Alaska gas pipeline development is the potential use of North Slope gas in Alberta's oil (tar) sands industry. North Slope natural gas, if developed, may be used to fuel oil sand operations in northern Alberta. These operations require large quantities of steam to extract crude oil from regional bitumen deposits. Some stakeholders object to the potential use of natural gas for crude oil production on the grounds that it, in their view, consumes a "clean" fuel to produce a "dirty" one, and because oil sands projects can have significant local environmental impacts.[80] The debate over the environmental impacts and potential energy security benefits of Canadian oil sands production is beyond the scope of this report. Nonetheless, given that the primary rationale for federal support of an Alaska natural gas pipeline is to increase lower-48 natural gas supplies, there is the potential for misunderstanding if substantial volumes of North Slope gas are instead diverted to the Canadian oil sands industry as Alaska natural gas begins flowing. This issue may require policy attention.

Terrorism Risks and Infrastructure Concentration

An Alaska natural gas pipeline would be integral to U.S. energy supply and have vital links to other critical infrastructure, such as power plants, airports, and military bases. While an efficient and fundamentally safe means of transport, such a pipeline would carry volatile material with the potential to cause public injury and environmental damage—either accidentally or intentionally. For these reasons, similar pipelines have been favored targets of terrorists in North America and overseas. Since September 11, 2001, federal warnings about Al Qaeda have mentioned pipelines specifically as potential terror targets in the United States.[81] Congress has responded with

(...continued)

Policy Issues, by Paul W. Parfomak.

[78] National Research Council, *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope*, Committee on the Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope, National Academies Press, Washington, DC, 2003.

[79] For example, see Jim Springhetti, "State Asks Court to Toss Bradwood Site's Approval," *The Oregonian*, January 26, 2009.

[80] IHS Cambridge Energy Research Associates, *Growth in the Canadian Oil Sands: Finding the New Balance*, Cambridge, MA, 2009, pp. III-1-III-20; Andrew Nikiforuk, *Dirty Oil: How the Tar Sands are Fueling the Global Climate Crisis*, Greenpeace, September 2009.

[81] "Already Hard at Work on Security, Pipelines Told of Terrorist Threat," *Inside FERC*, McGraw-Hill Companies, January 3, 2002.

substantial initiatives to protect U.S. pipelines from such attacks.[82] Nonetheless, due to its great length and passage through remote areas, an Alaska gas pipeline could still be vulnerable to vandalism and terrorist attack.

Concerns about the security of an Alaska gas pipeline are especially significant because of a recent history of physical attacks on existing pipelines in Alaska and Canada. For example, between October 2008 and July 2009, natural gas pipelines in British Columbia, Canada were bombed six times by unknown perpetrators.[83] In 1999, Vancouver police arrested a man planning to blow up the Trans Alaska Pipeline System (TAPS) for personal profit in oil futures.[84] In 2001, a vandal's attack on TAPS with a high-powered rifle forced a two-day shutdown and caused extensive economic and ecological damage.[85] In January 2006, federal authorities acknowledged the discovery of a detailed posting on a website purportedly linked to Al Qaeda that reportedly encouraged attacks on U.S. pipelines, especially TAPS, using weapons or hidden explosives.[86] In November 2007 a U.S. citizen was convicted of trying to conspire with Al Qaeda to attack TAPS and a major natural gas pipeline in the eastern United States.[87] To date, there have been no known Al Qaeda attacks on TAPS or other U.S. pipelines, but such attacks remain a possibility.

Construction of an Alaska gas pipeline directly alongside TAPS also raises concerns because it increases the concentration of critical U.S. energy infrastructure in the same narrow geographic corridor. When infrastructure is physically concentrated in such a limited geographic area it may be particularly vulnerable to geographic hazards such as natural disasters and certain kinds of terrorist attacks. Whereas a typical geographic disruption is often expected to affect infrastructure in proportion to the size of an affected region, a disruption of concentrated infrastructure could have greatly disproportionate—and national—effects. In 2005, Hurricanes Katrina and Rita demonstrated this kind of geographic impact by disrupting a substantial part of the national U.S. energy and chemical sectors, both heavily concentrated in the Gulf of Mexico. In 2008, Hurricanes Gustav and Ike caused similar disruptions, renewing concerns about geographic vulnerability. Adding 8.5% of U.S. natural gas supplies to a right-of-way that currently delivers nearly 17% of the nation's domestic oil production would be a significant increase in the physical concentration of U.S. energy flows.[88] As development of an Alaska natural gas pipeline continues, physical threats and required security measures may be an important policy consideration.

[82] For additional analysis of pipeline security issues, see CRS Report R41536, *Keeping America's Pipelines Safe and Secure: Key Issues for Congress*, by Paul W. Parfomak.

[83] Elise Stolte, "EnCana Puts Record $1M on Bomber's Head," *Edmonton Journal*, July 31, 2009.

[84] D. S. Cloud, "A Former Green Beret's Plot to Make Millions Through Terrorism," *Ottawa Citizen*, December 24, 1999, p. E15.

[85] Y. Rosen, "Alaska Critics Take Potshots at Line Security," *Houston Chronicle*, February 17, 2002.

[86] W. Loy, "Web Post Urges Jihadists to Attack Alaska Pipeline," *Anchorage Daily News*, January 19, 2006.

[87] U.S. Attorney's Office, Middle District of Pennsylvania, "Man Convicted of Attempting to Provide Material Support to Al-Qaeda Sentenced to 30 Years' Imprisonment," Press release, November 6, 2007; A. Lubrano and J. Shiffman, "Pa. Man Accused of Terrorist Plot," *Philadelphia Inquirer*, February 12, 2006, p. A1.

[88] Alyeska Pipeline Service Co., Internet page, Anchorage, AK, November 2, 2009, http://www.alyeska-pipe.com/about.html.

Conclusion

Constructing an Alaska natural gas pipeline from the North Slope to the lower-48 states has been a government priority—on and off and on again—for more than four decades. Concerted efforts by Congress, the State of Alaska, and other stakeholders in the early 2000s resulted in new momentum to proceed with the project. Many potential obstacles remain at this time, especially the project's economics. The Denali pipeline proposal has already been abandoned on economic grounds, but the TransCanada project appears to be proceeding. If a TransCanada pipeline begins transporting Alaskan gas to lower-48 markets by 2020 as its developers anticipate, it could have an impact on U.S. energy prices, energy security, and U.S. emissions of carbon dioxide. The project would also create a significant number of jobs and support regional economic development. Like other infrastructure projects in wilderness areas, however, an Alaska gas pipeline would also involve significant environmental costs, many of which have yet to be determined.

Ultimately, the regional effects of the pipeline's development on the Alaskan/Canadian environment must be weighed against its economic value, energy security value, and its global benefits in reducing carbon emissions from fossil fuels. To date, the judgment of Congress has favored the pipeline—but ensuring that its public benefits continue to outweigh its costs will likely remain a key oversight challenge for the next decade. If the balance tips the other way—either in the eyes of developers or the federal government—and the Alaska gas pipeline is not constructed, Congress may need to redouble its support of other energy initiatives that could fill the substantial expectations unmet by this project.

Appendix. Key Events

Table A-1. Key Events in Alaska Natural Gas Pipeline Development

1968	Prudhoe Bay oil and gas discovered
1969	United States begins export of LNG to Japan from south central Alaska (Cook Inlet)
1976	Alaska Natural Gas Transportation Act (ANGTA) passed, P.L. 94-586
1977	Presidential Decision and FPC Report to Congress on ANGTS
1977	FERC (successor to FPC) issues conditional certificate for pipeline
1978	Trans-Alaskan Pipeline System (TAPS) oil pipeline into service
1981	"Western leg" of Alaska gas pipeline (Pacific Gas Transmission) into service
1982	"Eastern leg" (Northern Border Pipeline) into service
1983	Maritime Administration study of marine alternatives to ANGTS pipeline released
2001	Alaska Natural Gas Interagency Task Force established
2004	Alaska Natural Gas Pipeline Act passed, P.L. 108-324, Division C
2006	New governor announces Alaska Gasline Inducement Act (AGIA) initiative
2007	Five proposals submitted for AGIA consideration
2008	Governor determines one AGIA proposal meets AGIA criteria
2008	Conoco Phillips and BP announce the Denali Project as an alternative to an AGIA project
2008	Alaska legislature approves governor's AGIA recommendation and it becomes law
2009	American Clean Energy Leadership Act of 2009 (S. 1462) proposed to raise loan guarantee
2010	TransCanada and Denali Projects hold open seasons soliciting shipper commitments
2011	Denali Project cancelled due to lack of customer commitments

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