ALASKA LEGISLATURE COMMITTEE FILES 1997-1998 8672

9394 HOUSE RESOURCES

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Representative Ogan.

REPRESENTATIVE OGAN: There's those -- there's a couple different [indisc.] of thinking on -- on the market window, and assuming that the -- the 2005 window is -- is the correct window, at least it was last year, what I've heard here, it seems that would be a -- be a little glitch in the Asian market that might buy us a little bit of extra time. Is that a fair analysis.

DR. VANURES: No. I have never been the believer in the concept of a window. Like I -- I have also argued that, you know, if -- if the fiscal terms are right, if the fiscal terms are effective, the Asian markets will grow and this project will enter that market when the conditions are -- are -- are appropriate and -- and good for this project. Obviously, if there is less demand, if we have to drop of two or three percent in demand in 1998, [indisc.] to 1997, instead of a growth of five percent, as was predicted, that will cause some delays.

CHAIRMAN HODGINS: Thank you, Dr. VanUres. Representative Bunde, you had a question of Dr. VanUres?

REPRESENTATIVE BUNDE: Yeah, thank you, Mr. Chairman. Dr. VanUres, I -- I think perhaps you may have answered this question. There was some discussion a moment ago about the price of Alaska North Slope crude, and was it fair to characterize your remarks as to say that the chances

DRAFT

Alaska North Slope LNG Economics

Based on Pedro van Meurs' February, 1997 Report

Base Case Economic Assumptions

- Project cost of $15 Billion
- LNG Price of $3.50/MMBTU
- Six year sales volume ramp-up
- Peak sales 14.5 million tons/yr

Economic Results

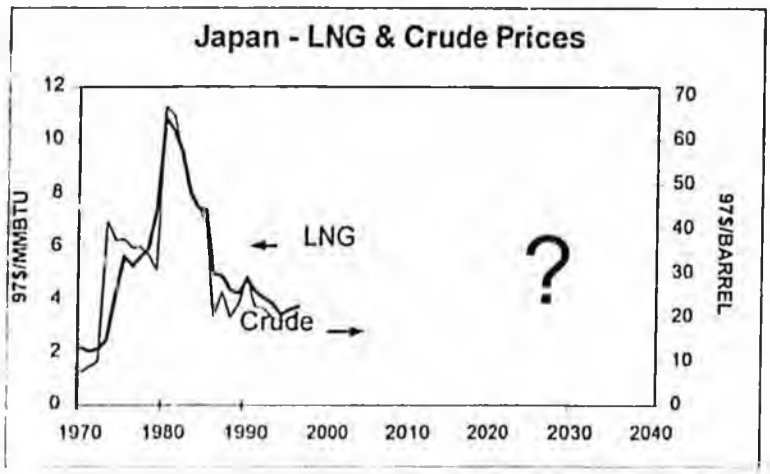
	$15 Billion	$12 Billion	Benchmarks
ROR - Total Capital	8.9%	10.8%	PvM "hurdle rate" of 12% to 14%*
ROR - Investor s Equity	11.4%	14.6%	PvM "hurdle rate" of 15% to 17%*
Netback Price	-$0.10/mcf	$0.64/mcf	PvM "minimum" of $0.98 to $1.02/mcf

* Each investor will have his own judgment as to the minimum acceptable ROR which will depend on many factors including the investor's cost of capital and the judgment as to the relative risk of the project.

Project Risks

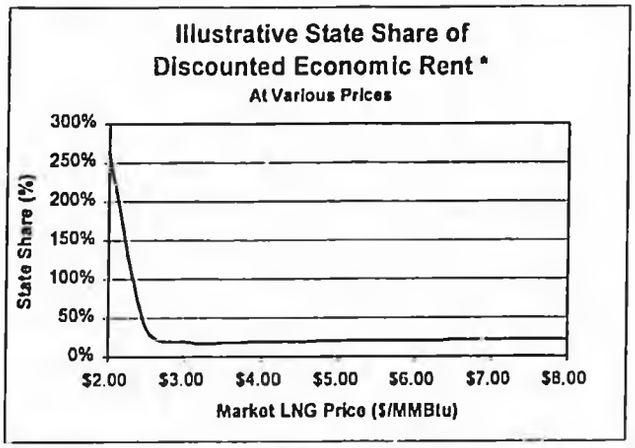
- The relative risks of a project is an important factor in deciding about the attractiveness of a project and in deciding the hurdle rate.
- Van Meurs states, "It should be noted that relatively speaking the Alaska project cannot be considered low risk."

Relative Project Risk Alaska vs Ras Laffan		
	Alaska	Ras Laffan
Risks		
Regional conflict risk	Very Low	Very High
General country risk	Low	Average
Gas reserve risk	Low	Very Low
Gas price risk	Average-High	High
Regulatory/legal risk	High	Low
Risk of cost overrun	High	Low
Market access	High	Average
Fiscal stability	High	Low



Key Conclusions from van Meurs' Report

- The Project is currently uneconomic
- The state fiscal system is not favorable to the project because it:
  - Does not offer fiscal stability ("an ANS LNG project will not occur without a significant enhancement of the stability of the fiscal terms.").
  - Is front-end loaded (i.e. state take begins before the project produces any revenue).
  - Is regressive (i.e. state take increases with decreasing profitability).



* Current Fiscal System at $12 Billion Investment

Van Meurs' Recommendations

- Substantially reduce costs.
- Improve profitability through a fiscal package in which the Federal, State and Local governments cooperate.
- Reduce the risks to the project (e.g. provide fiscal stability via a contractual arrangement between the state and the producers).

of a future legislature to revoke that contract and change that person's tax liability through the enactment of a general law. Viewed another way, Sections 1 and 4 of Article IX allow a contract to stand in the stead of a general law imposing a tax. This means that a future legislature may amend the tax liability imposed by the contract just as it may amend any general tax law.

[A contract that can be amended by any general tax law is not really a contract. The DOL's position that a tax contract entered into by the state is subject to unilateral change or even termination by the state runs contrary to the basic tenet of contract law that a purported agreement that does not bind both parties is illusory and therefore unenforceable, i.e., it is not really a contract. Accordingly, the DOL's position, if correct, would render a section of the Alaska Constitution as having no effect. As shown above, Article IX, Section 1 clearly provides that there may be circumstances under which the power of taxation may be contracted away. If the state is incapable of entering into a binding tax agreement (i.e., a contract), it necessarily follows that the power of taxation cannot therefore be "contracted away" as provided for in the Constitution.]

There is a contrary interpretation of Article IX, Sections 1 and 4. Article IX, Section 1 does not clearly state that the power of taxation may never be contracted away; instead, it states "[t]his power shall not be suspended or contracted away, except as provided in this article." Nowhere else in Article IX is the suspension or contracting away of the taxing power explicitly discussed. The minutes of the Constitutional Convention reveal, however, that what the framers had in mind was the provision in Section 4 empowering the legislature to create tax exemptions by general law.

[The Alaska Constitutional Convention was specifically presented with the opportunity to establish a constitution which would prohibit a legislature from entering into a binding tax contract and they intentionally chose not to do so. The language for the section which ultimately became Article IX of the Alaska Constitution initially proposed to the Finance and Taxation Committee of the Constitutional Convention provided: "the power to (sic) taxation shall never be surrendered, suspended or contracted away" and did not provide for any possible exceptions. The explanatory information provided with this proposed language provided in part: "Its object is to prevent the state from exempting, particularly by contract, individuals and corporations from taxation." 3 Constitutional Studies, Staff Paper IX, "State Finances", at 4-5 (1955).

It should be noted that the same explanatory material provided:

> *The power to tax is not considered inalienable, however. In granting exemptions, one legislature may bind another and thereby lose for the state its power to tax. The exemption may, under certain conditions, result in a contract relationship that legislatures may not abrogate without violating the federal constitutional guarantee against state legislation impairing the obligation of contracts. (Emphasis added.) Id. at 15-16.*

In the face of this information, the framers of the Alaska Constitution clearly chose to provide the legislature with the authority to grant binding tax exemptions, if authority to do so is granted by general law, and such authorization does not result in a complete surrender of the taxing authority.

The commentary of the Constitutional Convention further demonstrates the intent of the framers of the Alaska Constitution on this issue. The December 16, 1955 commentary concerning the Article IX, Section 4 language on exemptions provided in part: "The legislature is authorized to make further tax exemptions to encourage, among other things, new industry." This commentary also provided: "The power to tax is never to be surrendered, but under terms that may be established by the legislature, it may be suspended or temporarily contracted away. This could include industrial incentives, for example." Also, the Secretary of the Finance Committee to the convention stated on the floor of the convention on December 19, 1955: "Section 1 is a rather routine statement that the power of taxation shall never be surrendered or contracted away. The reason for the division of the thought there and the addition of the words 'except as provided herein' is to remove doubt as to what we might mean later on down in the article by providing exemptions . . . . Section 4 deals with exemptions from taxation, most of which is pretty standard . . . . And then in the last paragraph of that section it provides that other exemptions may be provided by general law. This would allow for, among other things, a granting of tax incentives to new industries." (Emphasis added.)

The Alaska Legislature in both the Alaska Industrial Incentive Act and the Industrial Incentive Tax Credit Act has provided that the granting of the tax exemption or the tax credit established a contract between the taxpayer and the state. The Acts specifically provided: "A grant of tax exemption under this chapter is considered a contract between the grantee and the state," AS 43.25.040 (repealed), and "A grant of tax credit under this chapter shall be considered a contract between the grantee and the state," AS 43.26.020 (repealed). The Alaska Supreme Court has recognized that the tax exemptions granted pursuant to the Alaska Industrial Incentive Act were not subject to challenges under the commerce and equal protection clauses of the Constitution and recognized that there was a contract between the state and the grantee. The issue of whether a future legislature was bound to that contract, however, was not before the court.]

The framers' choice of language creates an ambiguity, if not an outright conflict, between Secs. 1 and 4, because a general law tax exemption as a rule is not considered a "suspension" or a "contracting away" of the taxing power, but rather an exercise of it This ambiguity leaves open the argument that the framers' intent was to allow the legislature to authorize by general law the state to enter contracts exempting persons from certain taxes and that such contracts would be binding on future legislatures--i.e., future legislatures could not impose new or different tax obligations on the signatories to the contracts without running afoul of the Impairment of Contracts Clause of the U.S. Constitution.

ALASKA CONSTITUTIONAL CONVENTION

Commentary on the Article on Finance and Taxation

(Sec. 1 Taxing Power)

The power to tax is never to be surrendered, but under terms may be established by the legislature, it may be suspended or temporarily contracted away. This could include industrial incentives, for example.

(Sec. 2 Taxation of Non-residents)

This section and its wording is required by the latest proposed enabling act, H.R. 2535.

(Sec. 3 Uniform Standards for Assessment)

The legislature is authorized to set up, notwithstanding home rule or any system for the selection of assessors, uniform standards of assessment.

(Sec. 4 Exemptions from Taxation)

All property owned by the state and its subdivisions is exempt from taxation unless the legislature directs otherwise. An exception from tax immunity might be appropriate if a government engaged in what is normally a private business, such as operating a ski resort, a moving picture theater, or a swimming pool.

The second sentence of this section is intended to exempt from taxation that part of the property of religious, charitable, cemetery, or educational organizations which is actually used for those purposes, as the legislature may direct. But their property used for other

OILWATCH ALASKA

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DT: March 31,1998 **FAX CONTAINS FOUR (4) PAGES**
TO: Representative Ramona Barnes
FR: Jim Sykes, Executive Director
RE: Questions about Gas to Liquids (GTL) Technology, HB 393

Dear Representative Barnes,

Thank you for asking some important questions in regards to HB 393. Your forthrightness about doing thorough committee work on the bill was appreciated.

I will recap some of the content during our last meeting with Dr. Van Mueres in regards to GTL. Please be aware that the views of Dr. Van Mueres and those of state economists are not always the same in this area. Dr. Van Mueres sketched out the following example:

> *Imagine $100 billion worth of Natural gas at $3.50 per mcf. Subtract $15 billion for the cost of the pipeline and maybe another $10 billion for operating costs over the life of the line. You are left with $75 billion to tax the natural gas that goes through the pipeline. Next, imagine losing around 40% of the energy converting to gas liquids which may be worth $0.50 per mcf that would leave approximately $15 billion of taxable product. The plant that makes the gas liquids could also make diesel which could be sold commercially. The state may not currently have a way of taxing the end diesel product which companies could use in operations or sell for profit.*

GTL Technology is developing to where less energy is required to convert the gas liquids and more energy is retained in the conversion. It might be good to find out if the state could successfully tax a GTL downstream product such as diesel. It would seem prudent to address such an issue prior to negotiating a contract for our natural gas.

I am enclosing some of the latest information on GTL and potentially newer and better technologies from the Scientific American March issue. If GTL technologies become substantially more efficient and profitable, the state should prepare to tax them for their real value. Under the present circumstances, GTL's do not appear to be worth much to the State of Alaska, although that could change. It is very doubtful that new GTL technologies would address the same markets as LNG within the same time frame of 2005.

If you have further questions, please call 277-8910, 338-5551 or the cell phone at 230-3081.

Most sincerely,

Jim Sykes

Liquid Fuels from Natural Gas

Natural gas is cleaner and more plentiful than oil. New ways to convert it to liquid form may soon make it just as cheap and convenient to use in vehicles

by Safaa A. Fouda

Recently countless California motorists have begun contributing to a remarkable transition. Few of these drivers realize that they are doing something special when they tank up their diesel vehicles at the filling station. But, in fact, they are helping to wean America from crude oil by buying a fuel made in part from natural gas.

Diesel fuel produced in this unconventional way is on sale in California because the gas from which it is derived is largely free of sulfur, nitrogen and heavy metals--substances that leave the tailpipe as noxious pollutants. Blends of ordinary diesel fuel and diesel synthesized from natural gas (currently produced commercially by Shell in Indonesia) meet the toughest emissions standards imposed by the California Air Resources Board.

But natural gas is not only the cleanest of fossil fuels, it is also one of the most plentiful. Industry analysts estimate that the world holds enough readily recoverable natural gas to produce 500 billion barrels of synthetic crude—more than twice the amount of oil ever found in the U.S. Perhaps double that quantity of gas can be found in coal seams and in formations that release gas only slowly. Thus, liquid fuels derived from natural gas could keep overall production on the rise for about a decade after conventional supplies of crude oil begin to dwindle.

Although global stocks of natural gas are enormous, many of the deposits lie far from the people in need of energy. Yet sending gas over long distances often turns out to be prohibitively expensive. Natural gas costs four times as much as crude oil to transport through pipelines because it has a much lower energy density. The so-called stranded gas can be cooled and compressed into a liquid for shipping by tanker. Unfortunately, the conversion facilities required are large and complex, and because liquefied natural gas is hard to handle, the demand for it is rather limited.

But what if there were a cheap way to convert natural gas to a form that remains liquid at room temperature and pressure? Doing so would allow the energy to be piped to markets inexpensively. If the liquid happened to be a fuel that worked in existing vehicles, it could substitute for oil-based gasoline and diesel. And oil producers would stand to profit in many instances by selling liquid fuels or other valuable chemicals made using the gas coming from their wells.

Right now the gas released from oil wells in many parts of the world holds so little value that it is either burned on site or reinjected into the ground. In Alaska alone, oil companies pump about 200 million cubic meters (roughly seven billion cubic feet) of natural gas back into the ground daily—in large part to avoid burdening the atmosphere with additional carbon dioxide, a worrisome greenhouse gas.

But recent technical advances have prompted several oil companies to consider building plants to convert this natural gas into liquid form, which could then be delivered economically through the Alaska pipeline. On the Arabian Peninsula, the nation of Qatar is negotiating with three petrochemical companies to build gas conversion plants that would exploit a huge offshore field—a single reservoir that contains about a tenth of the world's proved gas reserves. And Norway's largest oil company, Statoil, is looking at building relatively small modules mounted on floating platforms to transform gas in remote North Sea fields into liquids. Although these efforts will use somewhat different technologies, they all must address the same fundamental problem in chemistry: making larger hydrocarbon molecules from smaller ones.

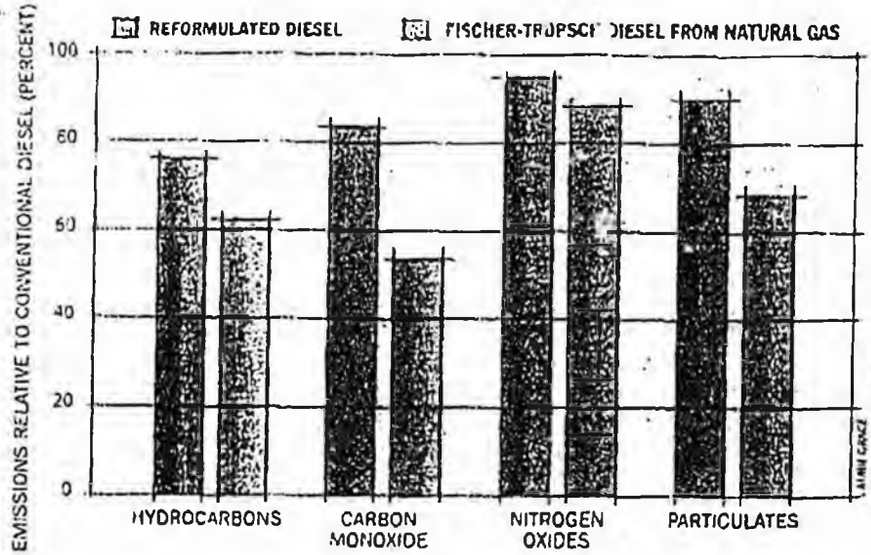
The Classic Formula

The main component of natural gas is methane, a simple molecule that has four hydrogen atoms neatly arrayed around one carbon atom. This symmetry makes methane particularly stable. Converting it to a liquid fuel requires first breaking its chemical bonds. High temperatures and pressures help to tear these bonds apart. So do cleverly designed catalysts, substances that can foster a chemical reaction without themselves being consumed.

The conventional "indirect" approach for converting natural gas to liquid form relies on brute force. First, the chemical bonds in methane are broken using steam, heat and a nickel-based catalyst to produce a mixture of carbon monoxide and hydrogen known as syngas (or, more formally, synthesis gas). This process is called steam re-forming.

The second step in the production of liquid fuels (or other valuable petrochemicals) from syngas uses a method invented in 1923 by Franz Fischer and Hans Tropsch. During World War II, Germany harnessed this technique to produce liquid fuels using syngas made from coal and atmospheric oxygen, thus establishing a reliable internal source for gasoline and diesel.

This Fischer-Tropsch technology has allowed Sasol in South Africa to produce liquid fuels commercially for decades using syngas derived from coal. The company uses the same basic technique today: syngas blown over a catalyst made of cobalt, nickel or iron transforms into various liquid hydrocarbons. Conveniently, the Fischer-Tropsch reaction gives off heat, and often this heat is



HARMFUL VEHICLE EMISSIONS were lowered somewhat in 1993, when U.S. regulations required that diesel fuel be reformulated to reduce pollution. Fuel derived from natural gas using Fischer-Tropsch synthesis creates even fewer emissions than reformulated diesel.

used to drive the oxygen compressors needed to make syngas.

Just which liquids emerge from the reaction depends on temperature. For example, running a reaction vessel at 330 to 350 degrees Celsius (626 to 662 degrees Fahrenheit) will primarily produce gasoline and olefins (building blocks often used to make plastics). A cooler (180 to 250 degree C) operation will make predominantly diesel and waxes. In any case, a mixture results, so a third and final step is required to refine the products of the reaction into usable fuels.

Refining synthetic crudes derived from gas is in many respects easier than working with natural crude oil. Synthetic crude contains virtually no sulfur and has smaller amounts of cancer-causing compounds than are found in conventional oil. So the final products are premium-quality fuels that emit fewer harmful substances.

A Partial Solution

This brute-force method of converting gas to liquids is reliable, but it is expensive because it uses so much energy. Conventional steam re-forming compresses methane and water vapor to about 30 times normal atmospheric pressure and heats these reactants to about 900 degrees C. And one must add more heat still, to coax the energy-hungry reaction continuously along. This extra heat comes from injecting a small amount of oxygen into the mixture, which combusts some of the methane (and, as an added benefit, makes more syngas). Chemists call this latter maneuver partial oxidation.

In general, syngas is generated using various combinations of steam re-forming and partial oxidation. In most cases, the process requires large quantities of oxygen—and oxygen is costly. Existing methods of separating oxygen from air rely on refrigeration to cool and liquefy it, an energy-intensive and expensive manipulation. Hence, lowering the cost of oxygen is the key to making syngas cheaply.

Fortunately, recent developments promise to revolutionize the way oxygen is produced over the next few years. One strategy is simply to work with air instead of pure oxygen. Syntroleum Corporation in Tulsa has developed a way to make liquid fuels using blown air and methane for the re-forming step, followed by Fischer-Tropsch synthesis. At sites where natural gas is sufficiently cheap (for example, places where it is now being flared), the process should prove profitable even at current crude oil prices. Together with Texaco and the English company Brown & Root, Syntroleum plans to build a commercial plant that will use this technique within two years.

Several other private companies, universities and government research laboratories are pursuing a wholly different approach to the oxygen problem: they are developing ceramic membranes through which only oxygen can pass. These membranes can then serve as filters to purify oxygen from air. Though still difficult and expensive to construct, laboratory versions work quite well. They should be commercially available within a decade.

Such materials could reduce the cost of making syngas by about 25 percent and lower the cost of producing liquid fuels by 15 percent. These savings would accrue because the production of syngas could be done at temperatures about 200 degrees lower than those currently used and because there would be no need to liquefy air. With cheap and plentiful oxygen, partial oxidation alone could supply syngas. This first step would then release energy rather than consume it.

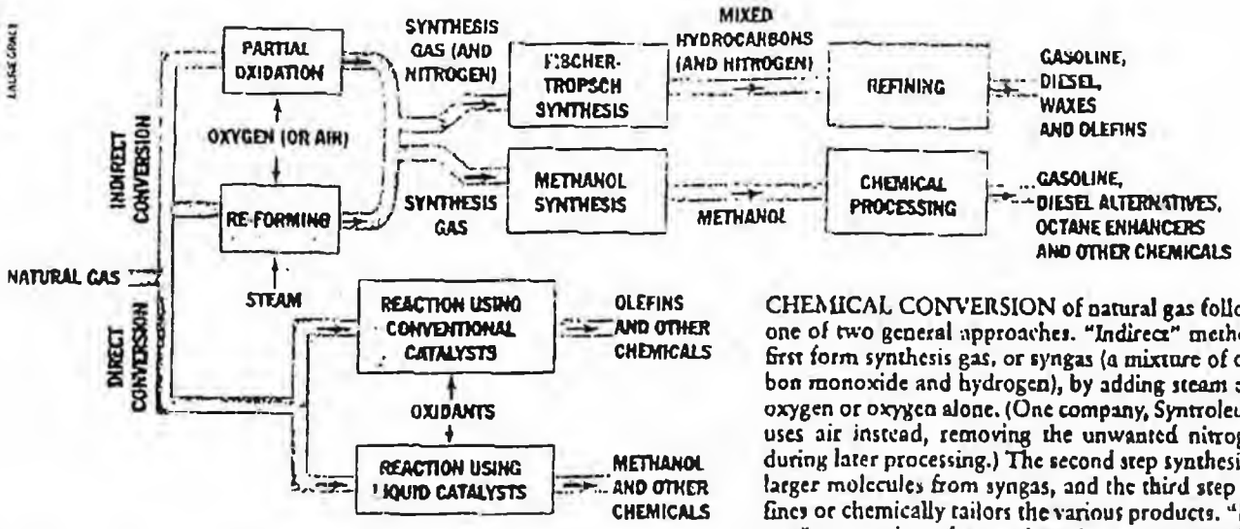
My Canadian colleagues and I, along with researchers at the University of Florida, are now attempting to create a different kind of ceramic membrane that would offer yet another advantage. The membranes we are trying to develop would remove hydrogen from the gas mixture, driving the partial oxidation of methane forward and providing a stream of pure hydrogen that could be used later in refining the final products or as an energy source itself.

We also expect to see significant improvements soon in the catalysts used to make syngas. In particular, researchers at the University of Oxford are studying metal carbides, and my colleagues at the Canadian Center for Mineral and Energy Technology are investigating large-pore zeolites. Both materials show great promise in reducing the soot generated during operation, a problem that not only plugs the reactor but also reduces the activity of the catalysts over time.

Cheaper than Oil?

Although the prospects for such brute-force methods of converting natural gas to liquid fuel improve every day, more ingenious techniques on the horizon would accomplish that transformation in a single step. This approach could potentially cut the cost of conversion in half, which would make liquid fuels produced from natural gas actually less expensive than similar products refined from crude oil.

Early efforts to achieve such "direct" conversion by using different catalysts and adding greater amounts of oxygen had produced mostly disappointment. The hydrocarbons that were formed proved more reactive than the methane supplied. In essence, they burned up



CHEMICAL CONVERSION of natural gas follows one of two general approaches. "Indirect" methods first form synthesis gas, or syngas (a mixture of carbon monoxide and hydrogen), by adding steam and oxygen or oxygen alone. (One company, Syntroleum, uses air instead, removing the unwanted nitrogen during later processing.) The second step synthesizes larger molecules from syngas, and the third step refines or chemically tailors the various products. "Direct" conversion of natural gas in one step requires an oxidant and may involve special liquid catalysts.

faster than they were produced. Unless the product is somehow removed from the reaction zone, yields are too low to be practical.

Fortunately, researchers have recently found ways to circumvent this problem. The trick is to run the reaction at comparatively mild temperatures using exotic catalysts or to stabilize the product chemically—or to do both. For example, chemists at Pennsylvania State University have converted methane to methanol directly using a so-called homogeneous catalyst, a liquid that is thoroughly mixed with the reactants and held at temperatures lower than 100 degrees C. And Catalytica, a company in Mountain View, Calif., has achieved yields for direct conversion that are as high as 70 percent using a similar scheme. Its liquid catalyst creates a relatively stable chemical intermediate, methyl ester, that is protected from oxidation. The final product (a methanol derivative) is easily generated with one subsequent step.

Methanol (also known as wood alcohol) is valuable because it can be readily converted to gasoline or to an octane-boosting additive. And in the near future methanol (either used directly or transformed first into hydrogen gas) could also serve to power fuel-cell vehicles on a wide scale. Thus, methanol can be regarded as a convenient currency for storing and transporting energy.

Moreover, the reactions used to synthesize methanol can be readily adjusted to churn out diesel alternatives such as dimethyl ether, which produces far fewer troublesome pollutants when it burns. So far dimethyl ether, like propane, has found little use as a transportation fuel because it is a gas at room temperature and pressure. But recently Air Products, a supplier of industrial gases in Allentown, Pa., announced the production of a dimethyl ether derivative that is liquid at ambient conditions. So this substitute for conventional diesel fuel would reduce emissions without major changes to vehicles and fueling stations.

Now You're Cooking with Gas

Scientists and engineers are pursuing many other possible ways to improve the conversion of natural gas into liquids. For instance, process developers are constantly improving the vessels for the Fischer-Tropsch reaction to provide better control of heat and mixing.

The most ambitious efforts now under way attempt to mimic the chemical reactions used by specialized bacteria that consume methane in the presence of oxygen to produce methanol. Low-temperature biological reactions of this kind are quite promising because they can produce specific chemicals using relatively little energy.

Whether or not this bold line of research ultimately succeeds, it is clear that even today natural gas can be converted into liquid fuels at prices that are only about 10 percent higher per barrel than crude oil. Modest improvements in technology, along with the improved economics that come from making specialty chemicals as well from gas, will broaden the exploitation of this abundant commodity in coming years. Such developments will also provide remarkably clean fuels—ones that can be easily blended with dirtier products refined from heavier crude oils to meet increasingly strict environmental standards. So the benefits to society will surely multiply as people come to realize that natural gas can do much more than just run the kitchen stove. ◻

The Author

SAFAA A. FOUDA received a doctorate in chemical engineering from the University of Waterloo in 1976. Since 1981 she has worked at the CANMET Energy Technology Center, a Canadian government laboratory in Nepean, Ontario. There she manages a group of researchers studying natural gas conversion, emissions control, waste oil recycling and liquid fuels from renewable sources. Recently she headed an international industrial consortium intent on developing better methods to convert natural gas to liquid fuels.

Further Reading

METHANE CONVERSION BY OXIDATIVE PROCESSES: FUNDAMENTAL AND ENGINEERING ASPECTS. Edited by E. E. Wolf. Van Nostrand Reinhold, 1992.

THE DIFFERENT CATALYTIC ROUTES FOR METHANE VALORIZATION: AN ASSESSMENT OF PROCESSES FOR LIQUID FUELS. J. M. Fox III in *Catalysis Reviews: Science and Engineering*, Vol. 35, No. 2, pages 169–212; August 1993.

CONVERT NATURAL GAS INTO CLEAN TRANSPORTATION FUELS. M. Agee in *Hart's Fuel Technology and Management*, Vol. 7, No. 2, pages 69–72; March 1997.

REMOTE GAS STRATEGIES. World Wide Web site by Zeus Development Corporation available at http://www.remotegasstrategies.com/

10.2.4 FURTHER ENHANCED COMPETITION

Significant improvements in fiscal terms may result in making the Yemen project more attractive.

Qatar may also become more aggressive in marketing gas once the current two projects are fully onstream. An ongoing further development of more projects would be beneficial for the Qatar economy.

10.3 RECOMMENDATION

Improved fiscal terms may help considerably in securing the earliest possible "slot" for the Alaska project during the 2005 - 2010 period. This would avoid the risks of further delays. However, on the other hand a delay in the project may be in some cases beneficial for Alaska and it is therefore not necessarily disastrous if some delays would occur.

Based on generalized economic calculations the indicative Project ROR of these projects could be compared with the applicable hurdle rates as follows for the $ 3.50 scenario:

INDICATIVE COMPARATIVE ANALYSIS AND RATING OF FUTURE PROJECTS				
	Hurdle	ROR	Diff	Rating
	%	%	%	%
Alaska - $12 billion	12.0%	10.8%	-1.2%	5
Canada-PACRIM	12.0%	12.0%	0%	2
Australia-Gorgon	12.0%	11.1%	-0.9%	4
Russia-Sakhalin II	14.0%	11.0%	-3.0%	8
Mal-Bintulu III	12.0%	11.4%	-0.6%	3
Indon- Irian Jaya	13.0%	14.1%	+1.1%	1
Indonesia-Natuna	13.0%	10.8%	-2.2%	7
PNG-Hides	13.0%	11.3%	-1.7%	6
Yemen - Hunt	13.0%	9.9%	-3.1%	9

It can be seen how Alaska seems to rate in the middle of the group of future projects.

Both the Canadian PAC-RIM and the Irian Jaya project are in the hurdle rate range. Malaysia III is close to the hurdle rate. The other projects seem unattractive at this time.

The total output of the projects would be 37.8 million tons per year. Only a few of these projects might be launched prior to 2010. Therefore, for Alaska to be able to enter the market in the 2005 - 2010 period, Alaska would have to compete with the best of these projects.

This indicates that the rate of return of the Alaska project would have to be improved considerably in order to make the project more profitable in comparison with the indicative rate of return of competing projects.

5.5 EFFECT OF TIME ON THE PROJECT

The effects of time on the Alaska LNG project are important.

As indicated earlier, the ramp-up speed could add about 0.7% to the Project ROR if the ramp up time could be reduced from 6 to 3 years. It is likely that the ramp up time could be reduced somewhat over time.

By the year 2010 the Pacific markets may increase at a rate of 3 million or more per year instead of 2.5 million tons per year. This might result in a situation where the ramp up time could be reduced to 5 years or 4.5 years. This would increase the rate of return and make the market access risk less.

At the same time the liquid loss which is estimated at 384 million barrels if the project starts in 2005 might be reduced to less than half this amount by the year 2010. This would add about 0.2% to the Project ROR.

A general benefit to Alaskan's might be that over time the CIF prices for gas in East Asia may increase in real terms, creating a considerably higher economic rent which in turn would result in much higher government revenues.

The main drawback of delays in the Alaska project is that the project may be "nibbled to death" by small projects coming in ahead of the Alaska project. Petroleum exploration in Asia used to be primarily for oil. Gas was considered a by-product. However, the strongly emerging gas markets in Asia have now created a situation where petroleum companies are now exploring for gas.

Exploration in Thailand, Pakistan and China is in many cases aimed at discovering gas. Vietnam may shortly initiate a program aimed at making gas exploration more attractive. Therefore, it can be expected that many gas discoveries will be made during the next decade.

At the same time the economics of small LNG liquefaction facilities is improving.

All such conditions could lead to a situation where Alaska may be delayed.

¶ 70,259

Yukon Pacific Corporation (ERA Docket No. 87-68-LNG), November 16, 1989.

DOE/FE Opinion and Order No. 350

Order Granting Authorization to Export Liquefied Natural Gas from Alaska

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[4] *See, e.g., Grand Valley Gas Company*, 1 FE ¶ 70,239 (August 25, 1989); *Potomac Energy Corporation*, 1 FE ¶ 70,237 (August 24, 1989); *Cascade Natural Gas Corporation*, 1 FE ¶ 70,225 (June 12, 1989); and *Wisconsin Public Service Corporation*, 1 FE ¶ 70,230 (June 19, 1989).

merce,[87] the exercise of that authority is subject to any terms or conditions attached by the DOE to the import or export approval.[88] In order to avoid overlap with enforcement of the "ANGTA condition" and to relieve the export from duplicative and unnecessary regulation, the DOE has decided to exercise its authority to limit any jurisdiction the FERC might otherwise acquire over the export project in the event TAGS and ANGTS share a facility that is subject to the FERC's interstate commerce jurisdiction, such as the Alaska Gas Conditioning Facility proposed by the ANGTS sponsors. The FERC shall only exercise such authority over the export project to the extent necessary to ensure that the shared facility is constructed and operated in accordance with FERC's regulations, including those concerning the environment. The FERC shall have no other authority over Yukon Pacific's export project, including its rates, except to the extent necessary to ensure that Yukon Pacific pays its part of the costs of any shared facility. The DOE intends this limitation on the FERC's authority to apply not only to the gas conditioning plant, but also to any other facility subject to the FERC's jurisdiction that the export project might utilize. This limitation does not apply to the FERC's section 3 authority over the liquefaction plant, marine terminal, and transportation of the LNG.

With respect to the liquefaction plant and marine terminal, the Secretary delegated to the FERC section 3 authority over the siting and construction of new import/export facilities. This delegation stipulates that the FERC cannot approve any site that the DOE disapproves. On the basis of its environmental review, the DOE has concluded that the Valdez export site is preferable to all other export sites that were considered in the FEIS, including the Cook Inlet site. Three factors discussed in the FEIS indicate that Port Valdez is environmentally preferable to the Cook Inlet alternative. First, the Cook Inlet alternative creates new disturbances in Minto Flats, an important subsistence use area. By contrast, the impacts of the proposed project are in an existing transportation and utility corridor. Second, the Cook Inlet alternative crosses Denali National Park and Preserve, and would impact visitors traveling to and from the park. While the proposed project would impact visitors and travelers elsewhere, Denali has the greater concentration. Finally, the Cook Inlet alternative includes a 15-mile subsea crossing, an impact to an ecosystem that does not occur under the proposed project. Accordingly, the DOE disapproves all sites other than the Valdez site. This action should not be interpreted as approval of the Valdez site. As discussed previously in Section V.B.5. *supra*, the DOE is requiring as Departmental policy that the FERC conduct its own examination of the health, safety, and environmental impacts associated with Yukon Pacific's use of the Valdez site for its proposed export project, including the liquefaction plant, the marine terminal, the LNG tankers, and the LNG tanker routes, and that it impose all appropriate conditions to mitigate the environmental effects resulting from the construction and operation of those facilities.

VI. Conclusion

After taking into consideration all the information in the record of this proceeding, I find that granting Yukon Pacific authority to export up to 14 million metric tons annually of liquefied North Slope natural gas for sale to the Pacific Rim countries of Japan, South Korea, and Taiwan during a term of 25 years has not been shown to be inconsistent with the public interest.

ORDER

For the reasons set forth above, pursuant to section 3 of the Natural Gas Act, it is ordered that:

A. Yukon Pacific Corporation (Yukon Pacific) is authorized to export for sale to Japan, South Korea, and Taiwan a total of up to 14 million metric tons of liquefied natural gas (LNG) annually from the North Slope of Alaska over a 25-year

[87] *See* DOE Delegation Order No. 0204-112, *supra* note 79.

[88] In *TransCanada Pipelines v. FERC*, No. 87-1229, June 16, 1989, the D.C. Circuit Court of Appeals found "Congress specifically precluded FERC from exercising its general ratemaking authority over imported [and exported] gas except to the extent that the Secretary expressly delegates the task to FERC." *Slip op.*, at 11; *see* also *id.*, at 7-9.

period beginning on the date of the first delivery, upon the conditions herein set forth.

B. For purposes of this Order, the "export project" means the Trans-Alaska Gas System (TAGS) and all appurtenant facilities, including production facilities, gas conditioning facilities, liquefaction plant, marine terminal, and LNG tankers.

C. With respect to the place of exportation for the LNG authorized in Ordering Paragraph A above, all locations other than Port Valdez, Alaska, are hereby rejected.

D. No cost of the export project shall be recovered from U.S. consumers of natural gas except to the extent that the cost relates to facilities and natural gas used and useful for supplying North Slope natural gas to the U.S. consumers.

E. No action shall be taken in connection with the export project that would compel a change in the basic nature and general route of the Alaska Natural Gas Transportation System (ANGTS) or otherwise prevent or impair in any significant respect the expeditious construction and initial operation of ANGTS.

F. All aspects of the export project shall be implemented in accordance with all applicable environmental procedures and requirements and shall comply with all preventive and mitigative measures imposed by Federal and State agencies to protect the public health, safety and environment.

G. All contracts and other documents that underlie the acquisition, transportation, and sale of North Slope gas authorized herein shall be filed with the DOE within 30 days of their execution.

H. Within 48 hours after deliveries begin, Yukon Pacific shall notify the Office of Fuels Programs, Fossil Energy, Room 3F-056, FE-50, 1000 Independence Avenue, S.W., Washington, D.C. 20585, in writing of the date that the first export of LNG authorized in Ordering Paragraph A above occurs.

I. With respect to the exports authorized by this Order, Yukon Pacific shall file reports with the Office of Fuels Programs (1) after the first full calendar month of service, and (2) within thirty days following each calendar quarter, indicating, whether sales of exported natural gas have been made, and if so, giving by month, the total volume of exports in Mcf and the average price for exports per MMBtu delivered to each respective purchaser. The reports shall also provide the details of each export transaction, including the name(s) of the purchaser(s), LNG tankers utilized, volumes sold to each purchaser, and identification of markets served.

J. Except for the authority under DOE Delegation Order No. 0204-112 over the export site, including the liquefaction plant, marine terminal, and related transportation of LNG, the Federal Energy Regulatory Commission (FERC) shall exercise no authority over the export project except to the extent necessary to ensure that (1) any facility used for the provision of natural gas from Alaska to another state and thereby subject to the FERC's interstate commerce jurisdiction is constructed and operated in accordance with the FERC's regulations, including those concerning the environment, and (2) the export project pays its share of the costs of any such facility.

Issued in Washington, D.C., on November 16, 1989.

TAGS PERMITS AND AUTHORIZATIONS

Over the past twelve years YPC has secured or satisfied all of the necessary legal approvals and requirements to export North Slope natural gas to Asia. These include:

1. **Presidential Approval:** *Presidential Finding Concerning Alaska Natural Gas: Removes impediment to Alaska natural gas exports required by Section 12 of the Alaska Natural Gas Transportation Act (15 U.S.C. 719j), January 13, 1988;*

2. **Project-Wide Environmental Impact Statement[1]:** *Trans-Alaska Gas System Final Environmental Impact Statement, June 1988 (23 federal and State agencies);*

3. **Ahtna Right-of-Way[1]:** *Grants to Yukon Pacific Corporation the right to designate and acquire certain rights in any and all lands acquired by or otherwise available to Ahtna under the Alaska Native Claims Settlement Act of 1971 which are reasonably necessary to construct, maintain, operate or terminate the pipeline, October 14, 1988;*

4. **Federal Right-of-Way[1]:** *Right-of-Way Grant for the Trans-Alaska Gas System from The United States of America to The Yukon Pacific Corporation, October 17, 1988;*

5. **State Right-of-Way[1]:** *Trans-Alaska Gas System Conditional Right-of-Way Lease, December 10, 1988;*

6. **DOE's Authorization for Export of Gas[1]:** *DOE/FE Opinion and Order No. 350, Order Granting Authorization to Export Liquefied Natural Gas From Alaska; Limiting of FERC's jurisdiction, November 16, 1989;*

7. **Confirmation of Order 350[1]:** *DOE/FE Opinion and Order No. 350-A, Order Denying Requests for Rehearing and Modifying Prior Order for Purpose of Clarification, March 8, 1990;*

8. **Anderson Bay (Port Valdez) Final Environmental Impact Statement[1]:** *Yukon Pacific Corporation LNG Project: Final Environmental Impact Statement, March 1995;*

9. **Order Granting NGA Section 3 Authorization for the Siting, Construction and Operation of LNG Facility:** *Federal Energy Regulatory Commission's approval of Anderson Bay, Port Valdez, Alaska as the Place of Export, May 22, 1995.*

10. **Prevention of Significant Deterioration (Air Quality) permit for LNG plant/marine terminal at Anderson Bay (Port Valdez):** *Reserves critical Port Valdez airshed "space" for future LNG plant and marine terminal emmissions; issued by Alaska Department of Environmental Conservation, August 5, 1997.*[1]

[1]These assets are exclusive property rights of Yukon Pacific Corporation currently held through its interest in Yukon Pacific Company L.P. and represent over 12 years of effort. It is important to note that the majority of these property rights were obtained before the *Exxon Valdez* oil spill and it is highly unlikely that they could be duplicated in a reasonable period of time, if ever.

Taken together, these authorizations and agreements give YPC the exclusive right to construct TAGS and export Alaska's North Slope natural gas to Asia.

November 12, 1997
House Oil & Gas
Gas Commercialization Team
Hearing on North Slope Gas Commercialization

Testimony by ARCO Alaska, Inc.

Mr. Chairman, for the record, my name is George Findling. I am a Coordinator in the gas commercialization group for ARCO Alaska, Inc. Today, I would like to elaborate on ARCO's plans to commercialize North Slope gas. Since ARCO's plan is LNG delivered to the Far East, I will mostly focus on this. Then I will briefly address gas to liquids technology.

To try to achieve economic viability of an Alaskan LNG, ARCO is moving on a four-point plan. Here's a brief elaboration on each of the four points:

Point #1 - Reduce project costs

Currently our most reliable cost estimate would suggest an expected cost of about $15 billion for the gas conditioning plant, pipeline system, LNG plant/terminal and ships. Although not achievable right now, we think that it is reasonable to visualize a cost goal of $12 billion or lower. But, before we could make such a cost estimate a reality, we need to complete the next phase of engineering and determine if cost reductions are feasible. At this time, ARCO is participating in preparatory work that will allow the next phase of engineering to begin in 1998. There are two important aspects to this engineering work. First, the work may demonstrate that significantly reduced costs are not achievable. Second, we need to find a group of motivated sponsors to fund the engineering work. And this brings us to the second point of our plan.

Point # 2 - Develop a viable project structure

There are two considerations here: what will the project structure be and who will participate (i.e. who is a sponsor). To bring focus, we are testing all of our plans for this project against three basic commercial structures. One we call leaseholder/integrated and it is somewhat analogous to the current structure for TAPS. In its pure form, the leaseholders own the downstream facilities in proportion with each's gas throughput, so leaseholders are both shippers and carriers. Also in this structure, the leaseholders sell directly to the buyers in the Far East. The second structure is similar to the first except that the downstream is made up of a carrier consortium that provides both transportation and processing. The third commercial structure is what we call the downstream/consortium, where, again in a pure form, the downstream sponsors purchase gas from the leaseholders and sell LNG to the Far East buyers. Considering the track record of LNG projects around the world, the actual structure for an Alaskan project may well be some variation or combination of these pure commercial structures.

An important step in developing a viable project is to attract sponsors who are interested in risking downstream investment dollars to try to make a project economic. Further, each sponsor needs to bring something, such as unique resources or skills, that help reduce gross project costs and or risks. When you consider the commercial structures discussed above, it is possible that a sponsor group may well be broader that just North Slope Leaseholders. In concept, we would like the sponsor group to be self-assembled and ready to proceed with the next phase of engineering in mid-1998.

Point #3 - Develop a viable market

The essence of LNG marketing is for LNG sellers to develop long term, durable relationships with buyers. Only through such relationships can the sellers and buyers come to understand and believe so much in the economic viability of a project that they are willing to make 30 year commitments. In this regard, there are several marketing matters that underpin ARCO's efforts.

The consensus projections we see on Far East LNG supply and demand seem to reveal a couple of trends. First, committed, expansion and new "phaseable" supplies are likely to meet demand through about 2005. But post 2005, demand begins to out pace these supplies, eventually opening up the opportunity for a large, green field project such as Alaska North Slope Gas. While this gives us some hope, we recognize that there may be more competing green field projects than there is demand. And, as the State of Alaska's consultant, Pedro Van Muers points out, Alaska does not rank on par with the most competitive in terms of overall economic viability, even considering some of Alaska's inherent advantages. Now, it might seem that we should simply declare our intentions to move ahead and that would secure Alaska's place in the market. But the problem with that approach is that the buyers will not commit to a noncompetitive project. Developing an economically competitive project in parallel with traditional marketing activities is essential.

When considering marketing, there is an other matter relating to commercial structure that should be acknowledged. Some have said that the far east buyers do not hear a unified "voice" from Alaska: the translation of this metaphor is that since there is no clear project structure or sponsor group, the roles of individual companies that visit the market place may be unclear to the buyers. For example, currently only the leaseholders can represent themselves as having gas for sale. Remember that buyers are looking to commit to long term LNG supplies: they want to see a rock solid commercial structure made up of highly motivated project sponsors who have access to gas and are ready to risk investment capital. While it requires some patience, we believe that the process of sponsor group self formation will ultimately produce a strong voice to the market.

In keeping with the approach of moving the project forward on all fronts, ARCO has maintained ongoing market activities. In the past two years, we have made six trips to the market and have hosted visits by trading companies here in Alaska. In general, buyers are

reacting positively to the prospects of making an Alaskan project economically viable and seem comfortable with our timing horizons.

Point # 4 Pursue federal and state fiscal /commercial regulatory matters

There seems to be general consensus that modifications to the state fiscal and commercial regulatory approaches are necessary to achieving a viable project. Please remember that such modifications are not sufficient to make a project viable: cost and other risk reductions are still critical. That said, here's a quick summary of the fiscal/regulatory issues.

There are two issues concerning the competitiveness of the state fiscal regime: long term stability and appropriate level of economic rent take. Since the discovery of Prudhoe Bay, there have been many changes in the state tax scheme, both at the statutory level and in the administration of the law concerning oil. No Alaskan LNG project can be competitive with the best international green field LNG projects if this same level of uncertainty exists. Happily, we see significant progress on this issue. In past years, major improvements have been realized on oil tax and royalty issues. Building on this experience, we are hopeful that the HB-250 process implemented by the legislature and administration can lead to the needed stability for an Alaskan LNG project.

The second issue is what the level of State take of economic rent is appropriate and competitive with provinces in which competitive green field projects are located. The work by Pedro Van Muers suggests that the current state fiscal system is too regressive and front end loaded to be competitive.

On the commercial regulatory front, there are issues of content and of jurisdiction. Concerning content, the issues of access (sometimes thought of as common carrier) and of rate (sometimes thought of as tariff) are the most leveraging.

On access, large LNG projects typically establish long term contractual relationships amongst sponsors and between sellers and buyers. Typically, the sales and purchase agreements are the most important to the project and the security of these agreements is essential to every project aspect. Clearly, these contracts are not secure if there is a chance that contracted throughput could be displaced by others. Therefore, the traditional notions of common carrier regulation must be abandoned in favor of some mechanism that creates guaranteed access. Naturally, there can also be no governmental mandate to expand the transportation system for late comers with out adequate compensation.

On the issue of rate regulation, there are two considerations. First, rate regulation will be tied to the commercial structures mentioned earlier. For the leaseholder integrated and carrier consortium structures, a recognition of contracted rates may be appropriate. But, our economic evaluations show that traditional cost of service tariffs will create too much front end burden on the project. Therefore, some type of levelized rate will be needed.

For the downstream consortium, rate regulation is meaningless because the project is in the business of buying gas and selling LNG, not providing transportation services.

Under current law, it is not absolutely clear whether regulatory jurisdiction would be federal or state and that jurisdictional question needs to be resolved. What ever the resolution, the export project requirements relative to access and rate point to less, rather than more, commercial regulatory activity.

On the federal fiscal side, the Pedro Van Muers study has compared overall tax regimes for a variety of potential LNG projects. While the federal and state structure in the US complicates the comparison, his results show that other countries are more competitive. Significantly, since the US government would take a larger share of the economic rent than the state under current law, its actions can be most leveraging to improving project economics. Van Muers identifies the depreciation rate on project investment for federal income tax as a potential candidate for modification.

These are the essentials of our four point plant to pursue an Alaskan LNG project with a target first LNG delivery in 2007. As we have said in the past, this timeframe is only viable if everything in our plans goes positively.

Gas to Liquids Technology

Mr. Chairman, we were requested to also talk about ARCO's views on Gas to Liquids technology. Such a discussion for ARCO will be necessarily brief in the Alaskan context. As I said above, for ARCO, LNG is the base case for Alaska; gas to liquids is the dark horse. It is necessarily the dark horse because development is in progress and pilot testing is needed. While we would not be so foolish as to rule out GTL for Alaska at this early stage, our corporate efforts on GTL are neither targeted to only Alaska nor are they taking away from resources currently being applied to Alaskan LNG. But, if the GTL technology proves to be viable and economic it could provide another option for Alaska.

As we previously announced on October 24, ARCO's Plano research lab is planning a 70-barrel per day pilot plant at our Cherry Point refinery in Washington State. The plant, to be operational in late 1998, is based upon our licensing agreement with Syntroleum. The GTL process is commonly thought to have three basic steps: production of synthesis gas from natural gas, conversion of the synthesis gas to "white crude" and the refining of this white crude to low aromatic, middle distillates. The focus of our pilot plant will be on advancing Syntroleum's proprietary technology for the second of these steps. Our tests may include a wide range of feed gas compositions; we see this technology has as having long term potential for commercializing stranded gas where ever it may occur in the world.

We understand that questions about the implication of GTL in Alaska have been raised. Since all we are doing is not ruling out GTL ARCO has not examined these matters rigorously. Considering that LNG is our base development case in Alaska and considering

that the technology is proprietary, perhaps the best thing we can do is direct you attention to some recent technical survey articles. One was in the Oil and Gas Journal, June 23, 1997 issue. Another was in the June 1997 Quarterly Review of Asian-Pacific Markets by Wood MacKenzie. If there is interest, we would be glad to pursue reprints of these.

Mr. Chairman, thank you for the opportunity to testify. I would be happy to address your questions.

February 24, 1998
House Oil & Gas
Hearing on HB-393 – Alaska Stranded Gas Development Act

Testimony by ARCO Alaska, Inc.:

Mr. Chairman, for the record, my name is George Findling. I am the Business Development Advisor in the gas commercialization group for ARCO Alaska, Inc.

Today, I would like to both express ARCO's overall support for HB-393 and discuss how this legislation fits into ARCO's plans for commercializing its very large gas resource on Alaska North Slope.

First, Mr. Chairman, our North Slope Gas commercialization manager, David Lawrence, was unable to be here today. He hoped you would understand, though, when you learned that he is in the far east continuing efforts to facilitate the self-assembly of a viable sponsor group for an Alaskan LNG project. I would like to expand on this for just a moment.

Several weeks ago, in January, ARCO sent out letters of inquiry to determine the level of interest of those who could potentially help advance a very large, complex, international LNG project in Alaska. Basically, the letters requested, under provisions of confidentiality, the opportunity for us to present a potential plan and discuss alternative ways forward. Since then, we have received many positive responses to the letters and have initiated presentations. This week, David is leading an ARCO Alaska team to the Far East for further presentations. I wish I could provide further details, but the formation process is in the fragile early stages and we do not want to complicate it by making representations for others. As is our policy, when there are developments which can be discussed, we will do so proactively.

I would like now to turn to the bill being considered by the committee. Looking back, the legislature is to be congratulated for enacting HB-250 last year. As you know, that bill created a substantial and cooperative effort during 1997 by the state's gas commercialization team and interested parties. This effort has lead to the proposed legislation now contained in HB-393. I would like to overview the bill and then briefly elaborate on how HB-393 supports ARCO's plans.

I would like to make three main observations about HB-393.

First, it provides the framework under which a competitive fiscal system can be developed. In our view, the framework legislation opens the door for cooperative action, in parallel with developments in other aspects of the project, to help to try to make an Alaskan project commercially viable. We see many important general provisions in the bill. It will not place inordinate demands on the state's staff because it allows the state to entertain applications from only serious parties. It is balanced in keeping sensitive and

proprietary information confidential, yet provides for public scrutiny of essential aspects leading to the fiscal system. It promotes Alaska hire and in-state gas matters. It accommodates current uncertainties in technology, project approach, development timing, and fiscal system development. Finally, it is also important to recognize that HB-393 does not in itself, create any unilateral and irrevocable commitments, which is appropriate at this early stage of project maturity.

Secondly, under this legislation, the fiscal system is provided by long term contract, and this can be very powerful in improving competitiveness. The execution of a fiscal contract near to the time of project sanction can give a level of fiscal stability which is both leveraging to the economics and competitive with other gas-rich provinces.

Third, we would support the addition of language calling for legislative approval of any contract. Not only is it appropriate in such a unique and significant decision, but this process of legislative action can significantly improve the durability and stability of the fiscal system.

Mr. Chairman, I would like now to turn to how the legislation relates to the ARCO plans. In our November testimony to this committee, we described how ARCO is moving forward on a four point plan to try to achieve economic viability of an Alaskan LNG project. For reference, I can provide copies of the testimony. Today, I would like to discuss the interrelationships between our plans and the legislation.

We see that the fiscal legislation both enables development to continue and integrates well into those activities. Let's look at those aspects in the context of a time line.

As we have said in the past, our current planning basis has the start up of an LNG project in late 2007, if everything goes right. And this makes 1998 important because a phased conceptual engineering effort should get underway later in the year to stay on track. This engineering is needed to establish confidence in and further reduce estimated project costs, which are essential to the project economics. It is also needed to develop the information necessary to develop proposals to potential gas buyers and to proceed with other project development activities.

In order for this next stage of engineering to commence, a sponsor group needs to be in place that can advance the project and share in the costs. In our preliminary discussions with potential sponsors, they have responded very positively to the prospects of framework fiscal legislation like HB-393. For ARCO specifically, we see passage as an critical signal of the long term willingness of the state to help make the project competitive.

Looking forward, HB-393 integrates well into our LNG project development plans. As the technical work matures and the sponsor group gels, the bill allows an application to be submitted for a fiscal contract. In our view, and again using our planning basis, the development of a fiscal contract should commence no later than 2000. Since the bill is

written generally, it does allow for flexibility in the timing of the application, the project structure and the nature of the new fiscal system, which are three important uncertainties right now. Under the bill, the fiscal contract can be developed in parallel with the other major agreements, such as sales and purchase agreements. Again, using our planning basis, it is our view that the fiscal contract should be in place no later than sometime in 2002. With that, the major agreements could be consummated and project sanction could occur, sometime in the 2003 timeframe.

Mr. Chairman, now I must pause for an important reality check. As I said above, a 2007 startup is our planning basis. But keep in mind that meeting such a start up requires that everything fall in place, almost without a hitch. Most importantly, we ultimately have to have a commercially viable project before it can be sanctioned. Simply stated we are trying to turn what is today a non-competitive project into a competitive project. It should be recognized that this effort may not succeed: for example, in the long term, we might not be able to get costs and cost uncertainty down; the federal government may chose not to provide the essential fiscal modifications that I described in my November testimony and the market may not be able to be developed at prices that can sustain an Alaskan project. In the shorter term, we may have difficulty attracting sufficient potential sponsors or we may find some other insurmountable hurdle. The bottom line message is that any timeline can change and that moving forward on each step requires success in the previous steps. Nonetheless, ARCO continues to be committed to trying to find a viable way forward by pursuing critical technical, fiscal, and commercial avenues.

As we mentioned in our November testimony before this committee, Gas to Liquids is our dark horse case for commercializing North Slope stranded gas. Without negatively impacting our Alaskan LNG development efforts, our Plano research group is trying to advance the technology in parallel. Critical to this effort is our licensing agreement with Syntroleum and our planned pilot test at our Cherry Point refinery this year. We are pleased to see that HB-393 does not preclude this option for commercializing stranded gas.

My final comments relate to commercial regulation, a topic that is not directly related to substance of HB-393. As you may recall, this topic was addressed in 1997 by the gas commercialization team under the auspices of HB-250. It was also addressed in our November testimony before this committee. While ARCO anticipates that state legislation is probably needed, we think more work needs to be done to develop an appropriate proposal. We would anticipate that the particulars of how instate gas will be handled will be part of that commercial regulatory approach. While this topic is not ripe for HB-393, we know that gas for local communities is a vital concern that can not be forgotten. Therefore, we support both the current wording in HB-393 addressing this topic in the application process.

In closing, ARCO is committed to trying to commercialize it's ANS gas as evidenced by our proactive plans. We think that the prospects for success in this effort can be substantially improved by a cooperative effort with the state. By that measure, HB-393,

is an essential step in developing that cooperation and we make this statement of support for the bill before the committee today.

Mr. Chairman, thank you for the opportunity to testify. I would be happy to address your questions.

ARCO Alaska, Inc.
Post Office Box 100360
Anchorage, Alaska 99510-0360
Telephone 907 276 1215

March 31, 1998

Representative Scott Ogan
Chairman
House Resources Committee
Alaska State Legislature
State Capitol (MS 3100)
Juneau, Alaska 99801-1182

Dear Chairman Ogan:

This letter addresses the matter raised at today's House Resources hearing concerning ARCO's planning basis for the startup of an Alaskan LNG project. As we stated in previous testimony to the legislature, our interpretation of the most likely startup date is 2007. I would emphasize that this is our interpretation: others may see it differently. We get to this planning basis in two ways: 1) by looking at various supply/demand figures calibrated by direct discussions with mayor potential LNG buyers and 2) by considering the many activities needed to get a project on line.

Our interpretation of supply/demand data suggests that around 2007, demand outpaces supply in the far east market. We estimate that, by that time, this additional demand may be on the order of 5 to 15 million tons per year, which may allow for the placement of the initial Alaskan LNG supplies. Naturally, this only can happen if the Alaskan project is able to compete economically with other supplies targeting this market.

Whatever the interpretations of the market situation, ARCO believes that the real focus should be on the near term activities that are necessary to develop a competitive project and place the gas in the market at the earliest opportunity. As we have testified previously, we think that the critical activity is to form a viable, motivated sponsor group that can advance the project on all fronts, especially the pursuit of cost improvements. Ideally, we would like to see the formation of the sponsor group and the commencement of conceptual engineering 1998. With that, and assuming that everything goes well, full project funding approval could occur sometime in the 2003 timeframe, allowing startup in 2007. I must repeat that this is our planning basis and it assumes successful outcomes along the way: in short that we are able to turn an uncompetitve project into a competitive project.

Finally, HB-393 is an essential signal that the state wants to proceed down the development road in partnership with private parties. It gives us the basic confidence to pursue our multi-point plan. Therefore, ARCO supports HB-393 in its current form and we recommend favorable action on it.

If we can provide additional information on this matter, please do not hesitate to ask.

Sincerely,

George R. Findling

George R. Findling
Business Development Advisor

Draft Testimony for House Resources - 31st March, 1998

For the record my name is David Brooks. I hold the post of Manager Alaska Gas in BP Exploration Alaska Incorporated and I am responsible for BP's initiatives to commercialize the gas reserves on the North Slope of Alaska.

Mr. Chairman I should like to thank you for this opportunity to testify before this committee and to explain BP's views on this Bill. I would also like to take this opportunity to compliment the Chairman and the members of the House Oil and Gas Committee on their work with the Bill.

The Bill addresses the issue of the commercialization of the gas reserves on the North Slope.

Today in Prudhoe Bay we have proven some 25 trillion cubic feet of gas and the US geological survey suggests that there could be in excess of another 100 trillion cubic feet yet to be found on the North Slope.

That is a lot of gas.

These proven plus yet to find reserves amount to another oil field at least the size of Prudhoe Bay, and that represents a very large commercial prize for BP, the State and the people of Alaska if we can find economic ways to get that gas to market, in some form or other.

I would like to assure the members of this committee that BP is taking the issue of the commercialization of those gas resources very seriously and continues to dedicate resources to exploring routes to commercialize it .

Over the past year or so we have had the pleasure and honor of working with the legislature, the state administration, other gas owners and interested parties on the commercialization of the North Slope gas. The Gas Commercialization Report published in January of this year was an outcome of that work and we consider it to be a very sound and professional review of the challenges surrounding the commercialization of the gas. This Bill is the next logical step following the recommendations of the Commercialization Report.

However, before I comment on the Bill in detail, I would like to note that already the gas on the North Slope is providing significant value to the State of Alaska.

Today some 7 and a half billion cubic feet of gas per day are produced and the majority of this is used in enhanced oil recovery initiatives . We estimate those initiatives have increased the recoverable oil reserves in Prudhoe Bay by some 2 billion barrels and that approximately 40% of today's Prudhoe Bay oil production is attributable to enhanced oil recovery and gas injection techniques. At a crude oil price of around $16 per barrel that additional production generates some $400 million per year for the state.

BP believes that this piece of legislation is important for the State and for the development of stranded gas. However, it is only enabling legislation, it does not commit the State to anything other than to enter into a negotiation, it does not "give anything away". The Bill creates options and as such BP supports it .

Our perception today is that the gas in Prudhoe Bay cannot competitively be brought to market. The Bill defines such gas as "Stranded Gas". But the Bill is broader than gas in Prudhoe Bay. The Bill applies to stranded gas wherever it might be found in Alaska and this is important as there has, as yet been little or no exploration specifically for gas. Thus the Bill creates an option, for the discussion of the North Slope Gas and for the discussion of any other gas that might be found in the future.

The Bill also leaves open the option for the route to commercialization of that gas. The Bill is applicable to both an LNG project and to a gas to liquids project . Although today, neither of these are commercially viable, we hope that one or perhaps both will be at some time in the future. And please do not forget, these two options are not mutually exclusive. The vast quantities of gas already proven on the North Slope means that we could do both an LNG project and a gas to liquids project. A strength of the Bill is that it encourages these options.

The Bill creates an option, an opportunity, for a qualified sponsor of a qualified project to enter in to a negotiation with the State and to define a fiscal contract specific to that project. The contract will be subject to the approval of the legislature, will define the taxes to be paid by the project and will define the extent to which the legislature intends to bind future legislatures on the fiscal treatment of the project. In this, the Bill provides an opportunity for the State and the sponsor of a project to address the fiscal risk in a the project, one of the key risks for gas projects which was identified by the State in the Commercialization Report.

The Bill is also a balanced Bill, in so much as it considers other issues important to the people and the State of Alaska. Any project must address in its scope how it will make gas available for use in the State . The project sponsor will also be required to the extent possible under the law to maximize the use of Alaskan labor and Alaskan contractors - something which BP strongly supports. And the Bill incorporates a process by which the communities in Alaska which will be affected by a project can assure themselves that they are being fairly treated in the negotiation and distribution of the taxes from the project.

Mr. Chairman and members of the Committee,

- This Bill is a piece of legislation that creates options for the State to generate value from the enormous gas resources on the North Slope of Alaska.

- The legislation gives nothing away, it only allows for a negotiation to take place.

- We urge you not to turn it into a gas pipeline Bill but to leave it as it is, applicable both to LNG and gas to liquids.

We also urge you to reconsider the sunset clau. : on page 10 of the Bill. That clause limits the applicability of Bill to projects making an application before the end of June, 2001. And by doing so it closes off options for the future.

Although we are working hard, we cannot control the development of technology or of markets for the gas. We cannot say when additional Stranded Gas fields might be found. But by keeping a cut off date, any cut off date, in the Bill we believe that the State is potentially reducing its options and possibly giving a negative message to the potential developers of technology and stranded gas resources. We would recommend to this Committee that the sunset clause be deleted.

Mr. Chairman, members of the committee with those reservation and comments I would like to reiterate that BP supports this legislation.

Thank you for your attention. I would be happy to answer any questions that you might have.

TAGS Pipeline Costs
vs.
Alliance Project

Comparison of TAGS pipeline cost estimate with cost reported for "Alliance" project.

Pipeline costs are typically expressed on a "diameter inch – mile" basis which accounts for variation of costs with the diameter of pipelines.

TAGS cost:

$6 billion
diameter = 42 inch
length = 796 miles
compressor stations = 3

cost expressed in diameter inch - mile = ($6 billion)/(796 * 42)

= $179,500 per diameter inch - mile

Alliance cost:

$2.7 billion
diameter = 214 miles of 42 inch,
1,632 miles of 36 inch
length = (214 + 1,632) = 1,846 miles
compressor stations = 14

"average" diameter = (214/1846) * 42 + (1632/1846) * 36 = 36.7 inch

cost expressed in diameter inch - mile = ($2.7 billion)/(1846 * 36.7)

= $40,000 per diameter inch - mile

Relative costs of TAGS and "Alliance" projects (on diameter inch - mile basis)

TAGS cost / Alliance cost = $179,500 / $40,000 = 4.5

Alliance project on target for mid-1998 construction start

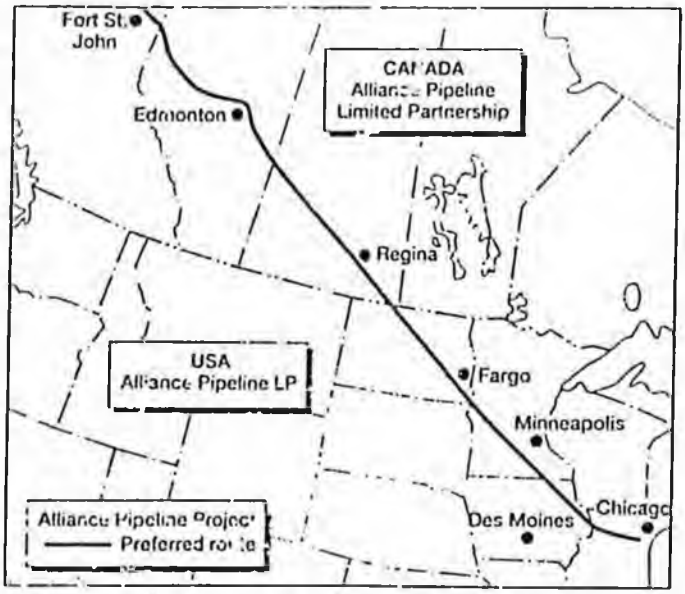
Approval given for contractors to use mechanized welding on pipe line's 900-mi section in United States

A Staff Report

Alliance Pipeline representatives report the 1,900-mi pipe line project to move natural gas from Western Canada to the Chicago area is on track to meet a mid-1998 construction start date.

The project still has to clear a number of U.S. and Canadian regulatory hurdles and finalize financing before construction can start. Alliance fully anticipates that approvals will be received during the Spring, which will allow work to kick off June or July. Pending final approval dates, completion is scheduled for late 1999.

Plans call for the $2.7-billion line to reach Chicago, where it will interconnect with the North American pipe line grid. Design specifications will allow an initial throughput of 1.325 Bcfd of rich natural gas (1,200 Btu/cf) at a maximum allowable operating pressure of 1,740 psi.



Alliance. Pending approvals, the Western Canada to Chicago Alliance gas pipe line project is scheduled for a mid-1998 construction.

The system's Canadian portion will consist of:

- 214 mi of 42-in. and 758 mi of 36-in. steel pipe
- 44 laterals totaling about 479 mi, ranging in length from about 0.2 to 86 mi and in diameters from 4 to 24 in.
- Seven compressor stations of about 31,000 to 38,000 hp each, spaced about 120 mi apart
- Mainline block valves spaced about 20 mi apart.

The U.S. portion will consist of:

- 874 mi of 36-in. steel pipe
- Seven compressor stations of about 31,000 to 38,000 hp each, spaced about 120 mi apart
- Mainline block valves spaced about 20 mi apart

The pipe line will generally parallel existing rights-of-way for most of its length.

Representatives report bid packages were based on using six spreads to build the 900-mi U.S. portion over a year-and-a-half time period. The mileage has been established with reachable objectives in both years. In 1998, the mileage is around 75 to 80 mi, depending on the length of the spread. This leaves some 100 mi per spread to complete in 1999. These objectives are makeable considering most of the route crosses agricultural land.

Alliance also included a unique feature in the bid package. With a number of projects scheduled for 1998 and 1999, the contractors won't be left high and dry in the event the project does not move forward. A specified payment will be made regardless.

Perhaps, the most unusual aspect of the project is that mechanized (automatic) welding will be an integral part of the construction process. This represents the first time mechanized welding will be used on a major U.S. pipe line construction project. The decision to use the system followed extensive demonstrations and testing as well as negotiations with the "unions" involved with construction.

Welded joints will be inspected using the ultrasonic inspection method. Ultrasonic testing, which has proven successful in Canada as well as on international projects, was selected based on speed and economics.

Current status. Alliance is supported by long-term commitments by shippers for contracted capabilities totaling approximately 1,300 MMcfd, or 98% of the available firm capacity of 1,325 MMcfd on the Alliance Pipeline Project.

The project is now moving through the regulatory approvals process in both the U.S. and Canada. Certificates of Public Convenience and Necessity are required from FERC, which approved a Preliminary Determination on Non-Environmental Issues on July 30, 1997, and from the Canadian National Energy Board

(NEB), before which public hearing started on Nov. 17, 1997. In both countries, other federal, state/provincial, regional and local permits/approvals will be required before construction can begin.

Financial advisory services for the Alliance project are provided by: The Bank of Montreal, the Bank of Nova Scotia (Scotia Capital Markets), the National Westminster Bank of Canada (NatWest Markets), the Chase Manhattan Bank of Canada (Chase Securities Inc.) and Goldman, Sachs & Co. Initial response from the investment community reportedly has been positive, and it is anticipated there will not be difficulty in financing the project.

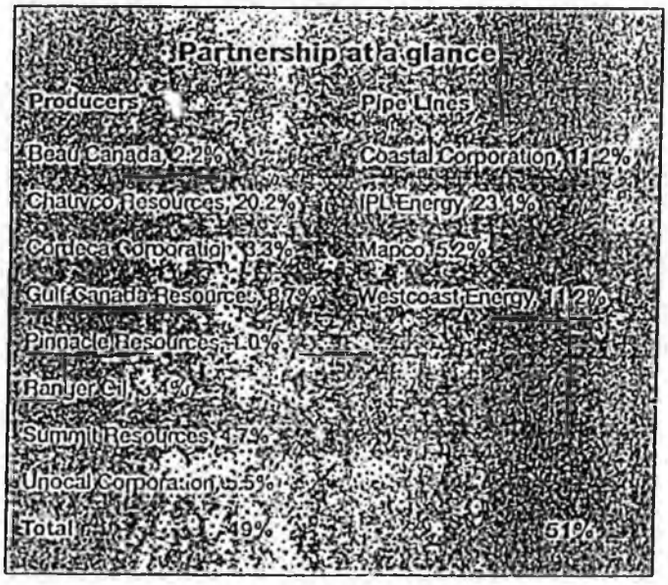
Environmental effects. Land use disturbance generally will not exceed about 105 ft in width. Adverse environmental effects from construction and operation can be minimized since the pipe line will generally parallel existing rights-of-way and because effective mitigative measures will be undertaken. For example, much of the route is located on agricultural land that can be successfully restored by separating topsoil from subsoil and conserving it in stockpiles for replacement after construction.

After the line is installed, all lands affected by construction activities will be cleaned up and rehabilitated. Well proven design and construction measures will be used in all areas to minimize environmental effects and to satisfy commitments to regulators and landowners. The restoration effort will be monitored after construction to ensure successful reclamation occurs.

The pipe will be buried for its entire length except for above ground facilities, such as compressor stations. In Canada, depth of cover will be a minimum of 42 in. in agricultural land, 36 in. in forested areas or native pasture lands, or 24 in. in areas where consolidated rock is encountered.

In the U.S., negotiated Agricultural Mitigation Agreements have been signed with the states of Illinois, Minnesota, Iowa and North Dakota to address many important issues, including depth of cover, drainage tile repair and topsoil conservation.

Design, construction, operation and maintenance of the Alliance Pipeline will use proven and accepted technologies, methods and procedures to protect public health and safety and to preserve private and public property.



Supply/demand. Several independent studies suggest that the Western Canada Sedimentary Basin has significant amounts of natural gas awaiting discovery and development.

Ongoing technological advances such as 3-D seismic and horizontal drilling have expanded reserve potential. Producers have identified northwest Alberta and northeast British Columbia as areas with high potential for new gas developments. However, for these reserves to be developed, lower-cost market access is required.

North America gas demand is expected to grow by about 1.5% per year, or 1 Bcfd/y. Canadian gas cannot participate in this growth without new pipe lines. The Alliance capacity represents about 20% of this demand growth over the next five years.

Given that lead times on a new pipe line are quite long, the market will have sufficient advance knowledge of the Alliance Pipeline to allow gas supply sources to participate in this growing market.

The future of the North American gas market will be tied closely to the emerging cost structure for the next sources of incremental supply. It is likely that the Western Canada Sedimentary Basin represents the incremental supply for the foreseeable future. Reducing the transportation cost of this supply is key to participating in the future growth of, and to providing security of supply for, the North American gas market.

Although North America is currently served by existing pipe lines, deregulation has led to market developments which have resulted in huge growth in short-term gas contracts, with a corresponding reduction in the

Continued on pg. 48-N

Continued from pg. 48-K

long-term market. Alliance will create an opportunity to deliver western Canadian gas to a point where North American market competition exists and the market volume and liquidity is large: the Chicago area market center, or "hub."

This will result in a North American physical gas "hub," where supplies from Canada can compete with existing supplies from the mid-continent, west Texas and the U.S. Gulf Coast and underpin delivery systems to other markets.

By providing increased natural gas transportation capacity to the "hub," Alliance will provide enhanced capability to deliver a significant, competitive, long-term and secure supply to the integrated North American pipe line grid.

Natural gas liquids. The historic practice for natural gas production has been based on the concept of removing natural gas liquids (NGLs) from the indigenous, produced gas-primarily methane-prior to exporting the natural gas from western Canada, even though for the past 25 years much of this NGL supply also has been exported.

As gas supply has increased, this practice has meant either additional liquid pipe line capacity is required to accommodate the NGLs, or that NGLs also would suffer from a lack of market access.

As a unique feature, Alliance will transport high-Btu gas in its natural state of hydrocarbon composition as produced from the reservoirs. This includes mostly methane, but also includes small amounts of ethane, propane and butane.

Only the water, heavy hydrocarbon condensate and other impurities, such as sulfur, will be removed prior to shipment. Through transportation of high-Btu gas, the pipe line minimizes the transport cost on a heating value basis.

It also provides a different market opportunity for higher Btu content NGLs contained in natural gas such as the conventional heating market. NGL extraction at Chicago is an option being studied by the pipe line partners as a separate business opportunity through the Aux Sable Liquid Products LP. ■

LNG demand, shipping will expand through 2010

Warren R. True Pipeline/Gas Processing Editor

The 1990s, especially the middle years, have witnessed a dramatic turnaround in the growth of liquefied-natural-gas (LNG; Fig. 1) demand which has tracked equally strong natural-gas demand growth.

Much of this growth has been for power generation in Asia, but even U.S. LNG demand in 1996 made a strong recovery (OGJ, Jan. 12, 1998, p. 33).

This trend was underscored late last year by several annual studies of world LNG demand and shipping.

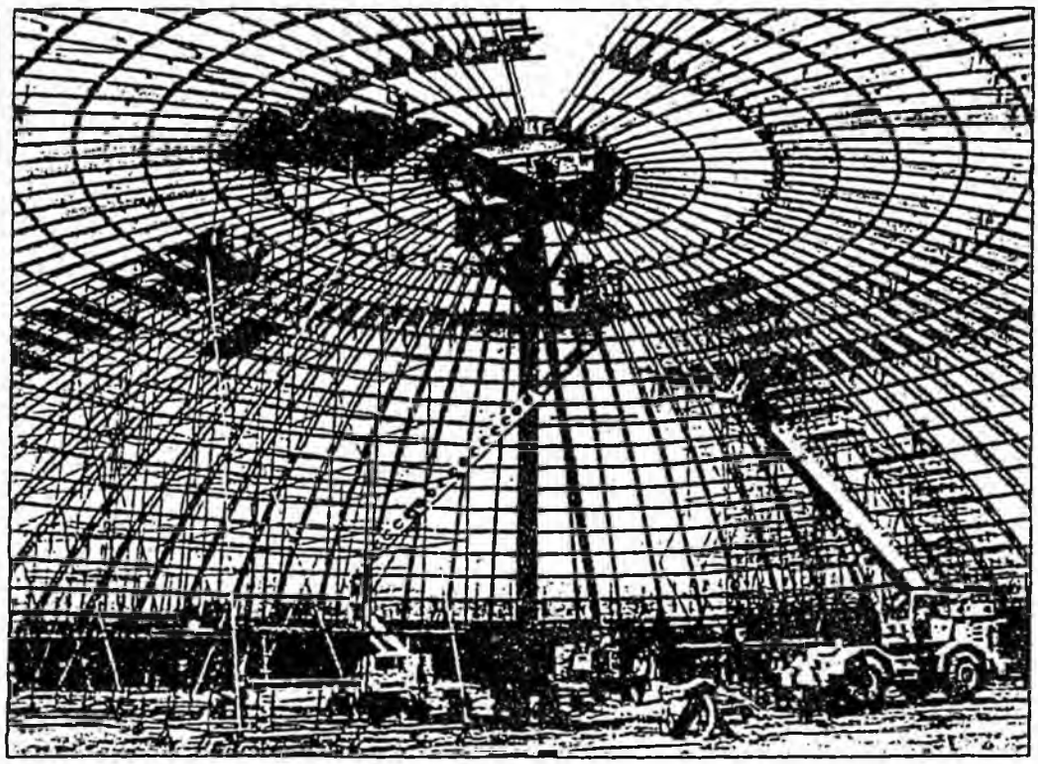
As 1998 began, however, economic turmoil in Asian financial markets has clouded near-term prospects for LNG in particular and all energy in general. But the extent of damage to energy markets is so far unclear.

Overall, nonetheless, demand growth in power-generation markets for natural gas including LNG appears likely to continue through 2000 if more slowly than was evident early in the 1990s.

A study by U.S.-based Institute of Gas Technology, Des Plaines, Ill., reveals that LNG imports worldwide have climbed nearly 8%/year since 1980 and account for 25% of all natural gas traded internationally. In the mid-1970s, the share was only 5%.

In 1996, the most recent year for which complete data are available, world LNG trade rose 7.7% to a record 92 billion cu m, outpacing the overall consumption for natural gas which increased 4.7% in 1996.

By 2015, says the IGT study, natural-gas use would surpass coal as the world's second most widely used fuel, after petroleum. Much of this growth will occur in the developing countries of Asia where gas use, before the current economic crisis began, was projected to grow 8%/year through 2015.



The dome for Tank No. 1 of Atlantic LNG's Trinidad project was installed late last year as the project moves toward start-up in 1999.

Similar trends are reflected in another study of LNG trade released at yearend 1997, this from Ocean Shipping Consultants Ltd., Surrey, U.K. The study was done too early, however, to consider the effects of the financial problems roiling Asia.

Global LNG demand will grow significantly through 2010, says Ocean Shipping's study, and result in eventual growth of seaborne shipping capacity.

World trade in LNG will expand to 122.7 billion cu m in 2000 and 155.8 billion cu m in 2005 from 92.3 billion cu m in 1995.

By 2010, LNG trade levels will reach more than 183 billion cu m, equivalent to an expansion of more than 4.5%/year during the 15-year period.

LNG trade expansion will be most dynamic near term, says Ocean Shipping, bolstered by expansion projects in Indonesia and Malaysia, along with new ones in Qatar, Oman, Nigeria, and Australia.

LNG imports, exports

IGT figures for 1996 (Table 1) show that almost 77% of the world's LNG was delivered to the three Asian countries, Japan, Korea, and Taiwan. Demand in the region rose nearly 9% that year.

Japan retained the title of world's largest LNG importer, with 61% of the total, but its market grew only 5%. Since Korea began importing LNG more than 10 years ago, says IGT's study, its demand has grown 20%/year; in 1996, Korean imports grew 40% to 13 billion cu m.

The shock of currency devaluation and related economic woes in early 1998 will likely slow that growth.

Almost all the remainder of world LNG production went to Europe in 1996, where markets have remained static. That will change for 1997: Italy completed refurbishing its only terminal at Panigaglia and resumed imports from Algeria. Turkey nearly doubled its imports in 1996 and, says IGT, has an enormous appetite currently being fed by spot market purchases.

For exports (Table 2), Asia-

Oceania accounted for 70% of 1996 LNG production, the world's largest being Indonesia with 35% of total sales. Algeria regained its second-place standing after revamping its plants.

Exports from Malaysia rose 29% in 1996 with completion of the Dua plant. And at start of 1997, Qatar moved into ninth position as exporter and will likely be exporting more than 12 million metric tons/year by 2000.

Oman, Trinidad, and Nigeria will soon join the list of exporting countries, possibly by very late 1998.

Ocean Shipping says Japan will import nearly 80 billion cu m/year by 2010, 36% more than in 1995.

South Korea's commitment to gas use and LNG imports is reflected in a growth of about 314% in trade levels to 29.5 billion cu m/year by 2010.

Taiwan's imports will also see more than a threefold increase during 1995-2010, increasing to 14 billion cu m/year. Japan, South Korea, and Taiwan combined, the study said, will account for 70% of world LNG trade in 2010.

New markets in Thailand, India, China, and Philippines should boost LNG trade medium to long-term, although their combined share of trade by 2010 will only reach a 10% share-equivalent to 17.5 billion cu m/year.

Ships, routes

In its annual study of LNG shipping, Ocean Shipping found that, when combined with an increasing level of scrapping, worldwide natural-gas-demand projections suggest a steady rise in total newbuilding.

Records set

Near-term (to 2000) average newbuilding need, in terms of the prevailing fleet capacity, will rise to 8.2%/year from 7%/year. Medium to long-term growth rates will moderate, falling to 5-6%/year to 2010.

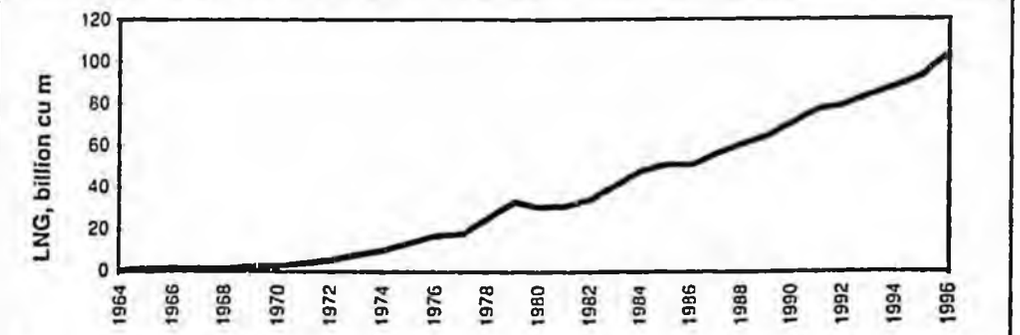
With Middle East exports of LNG to the Far East set to expand the next 15 years, Ocean Shipping says improved economies of scale are likely with the construction of larger LNG carriers.

Port restrictions will be the main constraint to size expansion, with the construction of 175,000-200,000 cu m vessels considered feasible.

LNG newbuilding prices declined during the early 1990s but recovered by 1996 to within 2% of the peak 1991 level. Additional South Korean yards have entered the LNG market with first delivery in 1994, and competition has intensified.

Yards in France, Japan, and South Korea have begun tendering for new vessels, although the project-based nature of LNG trading still results in the majority of new orders being placed with domestic yards, says Ocean Shipping.

GROWTH OF WORLD LNG TRADE



Source: Institute of Gas Technology, Des Plaines, Ill.

Table 1

LNG IMPORTING COUNTRIES, 1996

Country	Million metric tons	Billion cu m of gas	% of total	% change over 1995
Japan	44.237	56.034	60.93	4.50
Korea	9.470	11.995	13.05	35.99
Spain	5.568	7.053	7.67	0.19
France	5.104	6.466	7.03	0.13
France/Belgium*	0.165	0.209	0.23	-76.97
Belgium†	2.862	3.625	3.94	-5.96
Taiwan	2.575	3.262	3.55	5.55
Turkey	1.767	2.238	2.43	97.63
U.S.	0.850	1.077	1.17	124.35
Total	72.598	91.959	100	7.68

*Joint purchases from Abu Dhabi. †To this should be added 0.485 million cu m received by GdF for Distrigaz.

Source: Group internationale des importateurs du gaz naturel liquefié, Paris.

Table 2

LNG EXPORTING COUNTRIES, 1996

Country	Million metric tons	Billion cu m of gas	% of total	% change over 1995
Indonesia	25.372	32.139	34.95	3.85
Algeria	14.412	18.256	19.85	8.94
Malaysia	12.112	15.342	16.68	29.11
Australia	7.151	9.058	9.85	2.19
Brunei	6.038	7.649	8.32	-0.64
Abu Dhabi	5.315	6.732	7.32	9.03
U.S.	1.312	1.662	1.81	-1.79
Libya	0.885	1.121	1.22	-18.99
Total	72.598	91.959	100	7.68

Source: Group internationale des importateurs du gaz naturel liquefié, Paris.

The state of LNG shipping—volumes, vessels, and routes—is published annually by the Society of International Gas Tanker & Terminal Operators Ltd. (Sigtto), London. The most recent issue, LNG Log 22 for 1996, reflects the steady growth of LNG transport by sea.

In 1996, more than 1,750 voyages were completed by 91 vessels (Table 3). Loaded LNG vessels traveled nearly 4 million nautical miles and delivered more than 160 million cu m of LNG to 27 receiving terminals worldwide.

The number of voyages, nautical miles, and total cargoes for 1996 exceeded records set in 1995. Since 1964, says the Sigtto report, there have been only 2 years (1980 and 1981) when the amount of LNG discharged failed to exceed that of the previous year.

The year 1996 witnessed further concentration of LNG transport to and within the Far East. More than 124 million cu m (76.9% of the year's total volume) were discharged at Asian terminals to which vessels traveled on 1,129 voyages and during which they steamed 3.35 million miles, representing 84.4% of the worldwide total.

The number of vessel entries into Tokyo Bay, said the Sigtto report, increased to 429, equal to an arrival on average every 20.4 hr. In total since the maiden arrival of Polar Alaska at Negishi late in 1969, no fewer than 6,737 LNG carrier arrivals (27.2% of the 24,788 worldwide voyages logged to the end of 1996) have been

Table 3

1996 LNG DELIVERIES*

Region	Voyages	%	Logged miles	%	Deliveries, cu m	%	Cu m-miles	%
Europe	619	35.1	556,299	14.0	35,414,792	21.9	42,802,552,972	10.1
Far East	1,129	64.0	3,347,277	84.5	124,232,414	76.9	375,915,663,314	88.3
U.S.	15	0.9	59,396	1.5	1,810,600	1.1	7,135,902,569	1.7
Total	1,763		3,962,972		161,457,814		425,854,118,855	

*As of Dec. 31, 1996.

Source: LNG LOG 22, Sigtto, London.

recorded at the entrance to Tokyo Bay.

The cumulative amount of LNG landed has nearly doubled in the 7 years ending in 1996. Total number of voyages the study projected to have been completed by yearend 1997 was approximately 26,000.

Newbuildings, new routes

Five vessels made their initial cargo-carrying appearances in 1996, says LNG Log 22.

The fourth of five ships built at Chantiers de l'Atlantique for Petronas Tankers Sendirian Berhad, Puteri Zamrud, equipped with four Gaz Transport tanks of 130,568 cu m capacity, completed nine voyages from Bintulu to various terminals in Japan, Korea, and Taiwan.

Another Korean vessel, the Hyundai Greenpia, made her initial appearance late in the year and completed two voyages. She has a capacity of about 130,000 cu m contained in four Kvaerner spherical tanks.

Two new Liberian-flagged carriers for National Gas Shipping Co., Abu Dhabi, began service in 1996.

Mubaraz, the first vessel from the Kvaerner Masa yard in Finland, completed ten voyages from Das Island. Mraweh, the second of four vessels on order, made six deliveries.

Two more ships were delivered in 1997 bringing the National Gas fleet to eight vessels. Four earlier vessels were built in Japanese yards, says LNG Log 22.

Finally in 1996, the 19,474-cu m Surya Aki left the Kawasaki Heavy Industries yard at Sakaide, Japan. This Bahamian-registered ship, owned by MCGC International and managed by P.T. Humpuss Sea Tansport, Indonesia, has three Kvaerner spherical tanks and a 12,000-hp (8,827-kw) steam-turbine propulsion plant. The Surya Aki opened two new routes during the year.

There were seven routes in 1996 over which LNG was carried for the first time. Four were to Japanese destinations, including three newly opened receiving terminals; two others were in Spain; and the last, to the U.S. (Table 4).

In Japan, the three new terminals were the following:

- At Hatsukaichi, west of Hiroshima, the site of an installation of Hiroshima Gas Co. Ltd. and at which LNG from Bontang will be discharged. The Surya Aki completed five voyages over the Bontang-Hatsukaichi route in 1996.
- At Kogoshima, at the extreme southern end of the island of Kyushu, the terminal owned by Nippon Gas Co. Ltd.
- At Sodeshi, near Shizuoka, approximately midway between Tokyo and Nagoya, the terminal owned by Shizuoka Gas Co. Ltd.

In Europe, Spain's Enagás added two new port pairs to its network with routes between Marsa-el-Brega and Huelva and Das Island and Huelva.

Finally, Das Island was source of one cargo in 1996 for Everett, Mass., for Cabot; another followed in 1997.

LNG Log 22 says the first of these voyages, made by Khannur under charter to Cabot, marks the first call at a U.S. terminal since the Golar Freeze under charter to El Paso, arrived at Cove Point, Md., in March 1980.

Future vessels

Set to join the world's LNG fleet in 1997 were several vessels to serve Far Eastern receiving terminals.

Among these were the first of ten vessels to carry Qatar LNG from Ras Laffan to a new Japanese terminal at Kawagoe. Chubu Electric Corp., buyer of the gas, also has terminals at Chita and Yokkaichi in the Chubu region around Nagoya.

The first two of these vessels, actually handed over by the building yard before yearend 1996, are Al Zubarah and Al Knor, 135,000 cu m ships built by Mitsui and Mitsubishi, respectively, and to be operated by Mitsui OSK Lines and NYK.

Equipped with five Kvaerner spherical tanks, both are owned by a consortium consisting of Mitsui OSK, NYK, Kawasaki Kisen, Showa Line, and Iino Kaiun.

These were followed in 1997 by Al Rayan, from Kawasaki Heavy Industries, and Al Wajbah, from Mitsubishi. Later, six more vessels now being built will join the Qatar fleets. LNG Log 22 says that still more would undoubtedly serve the Ras Laffan plant in the future.

The last two vessels for Abu Dhabi's National Gas Shipping Co., Alhamra and Umm Al Ashtan, will be delivered by the Kvaerner Masa yard in Finland.

NKK Corp.'s Tsu, Japan, shipyard in mid-1997 launched Aman Sendai (OGJ, Oct. 20, 1997, p. 52), the second LNG carrier NKK has launched that uses the membrane-tank system. The 18,800-cu m Aman Sendai was built for Asia LNG Transport Sdn. Bhd. (ALT), Malaysia.

ALT is a shipping joint venture between Japan's Nippon Yusen K.K. and Malaysia's PNSL Bhd. The first and sister vessel, the 18,800-cu m Aman Bintulu, was also built at NKK's Tsu works and delivered to ALT in October 1993.

The Aman Sendai was to be chartered by Malaysia LNG Sdn. Bhd. (MLNG) to transport LNG from Malaysia's Sarawak gas fields to Gas Bureau of Sendai, Miyagi Prefecture, on the Pacific Coast about 350 km north of Tokyo, according to NKK.

The city concluded a 20-year agreement with MLNG to purchase 150,000 metric tons (more than 7.3 bcf) of LNG annually from June 1997 and built a new LNG receiving terminal at its port.

Sendai's Gas Bureau is Japan's third medium-sized regional city gas utility to supply natural gas by directly importing LNG. Japan's three largest gas companies, in Tokyo, Osaka, and Nagoya, have already switched to LNG from LPG/naphtha.

In addition, NKK said in late 1997 that it had received a third order from ALT for another LNG carrier. The vessel, also to transport LNG for Saibu Gas, is under construction at NKK's Tsu shipyards and expected to be completed in September 1998.

LNG Log 22 reports that the last of the five "princesses" for Petronas Marine Sendirian Berhad was to be delivered in 1997 by Chantiers de l'Atlantique, of St. Nazaire. She is to be named Puteri Firuz.

In the future, Korea Gas Corp. has six ships on order for 1999 delivery, split among Hyundai, Samsung, Daewoo, and Hanjin. Moreover, seven additional vessels to be built by the same shipyards will follow in 2000 and later.

Table 4

OPERATING LNG RECEIVING TERMINALS

Terminal and country	Owner	Start-up date	Vaporization design capacity, million cu m/day	Storage capacity, cu m of LNG	Source of supply	Expansion plans
Japan						
Negishi	Tokyo Gas, Toklyo Electric	1969	53	1.25 million (16 tanks)	Alaska, Brunei	
Senboku 1	Osaka Gas	1972	9	4 x 45,000	Brunei	
Sodegaura	Tokyo Gas, Tokyo Electric	1973	110	2.66 million (35 tanks)	Brunei, Abu Dhabi Malaysia, Indonesia	
Senboku II	Osaka Gas Kansai Elec. Nippon Steel	1977	50	1.405 million (17 tanks)	Indonesia, Australia	
Tobata	Kyushu Elec., Nippon Steel, et al.	1977	25	8 x 60,000	Indonesia, Australia	
Chita	Chubu Elec. Toho Gas	1977	25	4 x 75,000	Indonesia	
Himeji	Kansai Elec.	1979	17	6 x 80,000 1 x 40,000	Indoensia, Australia	
New Chita	Chubu Elec. Toho Gas	1983	33	6 x 80,000 1 x 160,000	Indonesia, Australia	
Nigata	Tohoku Elec. Nihonkai LNG	1984	40	520,000 (6 tanks)	Indonesia, Australia	
Himeji Joint Terminal	Osaka Gas Kansai Elec.	1984	15	1 x 40,000 6 x 80,000	Indonesia, Australia	
Higashi-Ohgishima	Tokyo Electric	1984	55	9 x 60,000	Malaysia, Indonesia	
Futtsu	Tokyo Electric	1985	60	4 x 90,000 2 x 125,000	Malaysia, Australia, U.S., Abu Dhabi	+250,000 cu m storage 1999; 250,000 cu m 2002; 250,000 cu m 2004
Yokkaichi	Chubu Elec.	1987	23	4 x 80,000	Australia, Indonesia	
Yanai	Chugoku Electric	1990	9	6 x 80,000	Australia, Indonesia	
Oita	Kyushu Elec. Oita Gas	1990	12	4 x 80,000	Australia, Indonesia	
Yokkaichi Works	Toho Gas	1991	2.4	2 x 80,000	Australia, Indonesia	
Fukuoka	Saibu Gas	1993	4.1	2 x 35,000	Malaysia	
Kagoshima	Nippon Gas Co.	1996	0.3	1 x 36,000	Indonesia	
Hatsukaichi	Hiroshima Gas	1996	0.4	1 x 85,000	Indonesia	+1.1 million cu m sendout cap.
Kawagoe	Chubu Electric	1997	20	4 x 120,000	Qatar	
Sodeshi-Shimizu	Shizuoka Gas	1997		1. 80,000	Malaysia	
Other Asia						
Pyeong Taek (Korea)	Korea Gas Corp.	1986	50	7 x 100,000	Indonesia, Malaysia, Brunei, Australia	+3 x 100,000 cu m storage in 1998
Inchon (Korea)	Korea Gas Corp.	1996	25	3 x 100,000	Indonesia, Malaysia	+700,000 cu m storage in 2000
Yung-An (Taiwan)	Chinese Petroleum Corp.	1990	28	6 x 100,000	Indonesia, Malaysia	Adding 390,000 cu m storage
Europe						
Panigaglia, Italy	Snam	1969	11	1 x 40,000 6 x 80,000	Algeria	
Barcelona, Spain	Enagas	1970	24	2 x 50,000 2 x 80,000	Algeria Libya	
Fos-sur-Mer, France	Gaz de France	1972	22	2 x 35,000 1 x 80,000	Algeria	
Montoir, Fnace	Gaz de France	1980	36	3 x 120,000	Algeria	
Zeebrugge, Belgium	Distrigaz	1987	16	3 x 87,000	Algeria	
Huelva, Spain	Enagas	1988	10.8	1 x 65,000 1 x 100,000	Algeria	
Cartagena, Spain	Enagas	1989	4.2	1 x 55,000	Algeria	+6.6 million cu send out 105,000 cu m storage by 1999
Marmara Ereglisi, Turkey	Botas	1994	16	3 x 85,000	Algeria	
U.S.						
Everett, Mass.	Distrigas	1971	12	1 x 60 000 1 x 95,000	Algeria	+4.0 million cu m sendout cap. by 1998
Lake Charles, La.	Trunkline LNG	1980-1981; reopened 1989	19	3 x 94,400	Algeria	
Cove Point, Md.	Cove Point LNG	1975-80; now operating as storage peak shaving facility	27	3 x 60,000	Algeria	

Source: Institute of Gas Technology, Des Plaines, Ill.

State of Alaska

Office of the Governor

Tony Knowles
Governor
P.O. Box 110001
Juneau, Alaska 99811-0001

NEWS RELEASE

Bob King
Press Secretary
Claire Richardson
Deputy Press Secretary
907-465-3500
FAX: 907-465-3533

FOR IMMEDIATE RELEASE: February 9, 1998 98-031

KNOWLES' BILL ENCOURAGES GASLINE DEVELOPMENT, JOBS

Bill includes Provisions for Alaska Hire, Gas for Alaska Communities

Legislation that encourages development of Alaska's enormous North Slope natural gas reserves, while providing for the hire of Alaska workers and use of Alaska businesses and gas for Alaska communities, was transmitted to the Legislature by Gov. Tony Knowles today.

"The challenge we face is to bring the North Slope's vast natural gas reserves to market in a cost-effective manner, while still making sure it's a good deal for Alaskans," Knowles said. "This legislation allows the state to negotiate a tax structure that provides the incentives producers need to develop this resource in a highly competitive world market, while securing commitments from the producers to hire Alaskans, use Alaska businesses and provide gas for Alaska communities."

The result of nearly a year's work by Knowles' Gas Commercialization Team, the legislation authorizes the state to negotiate with the sponsors of a gas line project for payments in lieu of taxes that otherwise would be imposed by the state or a municipality. This would include state and local property taxes; sales and use taxes; production or severance tax; and state corporate income tax. For municipalities, the bill provides the option of an equity interest in the project in lieu of taxes.

The idea is to create a progressive tax structure that shifts the tax burden from the beginning of a project to later years when producers are realizing the profits from their investment. Such "back-end loading" of the tax burden is intended to reduce the risks and improve the economics of a gas project that might not otherwise be developed.

In return, the bill clearly spells out that Alaska communities must have access to the clean-burning energy and describes terms regarding the notification, recruitment and employment of Alaska residents and Alaska businesses on the project. The bill requires contractors to advertise in-state and use Alaska job service organizations in recruitment efforts.

Experts estimate there are 35 trillion cubic feet of natural gas on the North Slope, some of which is currently re-injected into the Prudhoe Bay fields to increase oil production. This gas is America's second largest reserve of hydrocarbon energy, second only to

-more-

Prudhoe's oil fields. Alaska's major gas owners are BP, ARCO, Exxon and the state. The state's 12.5 percent royalty share of the gas is not changed in Knowles' legislation.

"An Alaska natural gas project makes good sense for many reasons," Knowles said. "It will create an estimated 10,000 construction jobs and 600 permanent jobs for Alaskans. It will help stimulate the American economy, improve our balance of payments, and strengthen Alaska's relationship with our Pacific Rim trading partners. It provides millions of dollars to the state and federal treasuries and will make natural gas available to Alaska communities along pipeline route."

The bill requires that the Revenue Commissioner compare the projected in lieu payments with the estimated cost of additional state and local government services; address the effect of the proposed contract on the state's revenue; and determine whether the proposed contract terms are in the best interests of the state. Knowles called for the legislature to review and formally approve any contract terms after extensive public hearings.

In order to make that best interest finding, the legislation requires the disclosure of financial, technical and market information regarding the project that is necessary for the development of contract terms and describes the treatment of proprietary information.

Knowles' legislation is the culmination of several years of work. Knowles first negotiated a memorandum of understanding with North Slope gas owners on the steps needed to move the proposal ahead. Noted natural gas economist Dr. Pedro Van Meurs provided expert analysis on the world natural gas market and recommendations on state actions to make the project feasible. Last year, Knowles and the Legislature created the Gas Commercialization Team to examine the complex issues involved and draft the proposed legislation.

"In the past few years we have seen the gas line project go from impossible to improbable to now the doable," Knowles said. "This legislation is the next step forward. It allows the state to negotiate a long-term contract that improves the competitiveness of the project and provide the state with its fair share of the benefits. That contract must also address Alaska hire and contracting and payments to municipalities in lieu of taxes for social impacts of development. And it includes a plan to make gas available to Alaska communities.

"The major reason Alaska is as close to a natural gas project as it is today is the partnership between the legislative and executive branches of state government and industry," Knowles added. "This is a bipartisan issue that all Alaskans can support. I urge the Legislature's quick and careful consideration of this bill."

-30-

Resource Development Council for Alaska, Inc.

121 West Fireweed Lane, Suite 250, Anchorage, Alaska 99503-2035
(907) 276-0700 Fax: (907) 276-3887 e-mail: rdc@aonline.com

March 18, 1998

Representative Mark Hodgins, Chairman
Special Committee on Oil and Gas
Alaska State Legislature
State Capitol (MS 3100)
Juneau, AK 99801-1182

Dear Representative Hodgins:

RE: Support for HB 393, relating to development of Alaska's stranded natural gas resources.

The Resource Development Council for Alaska, Inc. (RDC) supports HB 393 and urges its passage. RDC has long advocated for the exploration, development and production of Alaska's oil and gas resources. This legislation allows the state to create favorable fiscal conditions for the development of Alaska's stranded gas reserves on the North Slope.

RDC realizes HB 393 alone will not create a situation in which a North Slope natural gas project is economically feasible. The costs, profitability and risk of any potential project must be thoroughly examined. A restructuring of the state's current "front-end loaded" tax scheme, will likely help to attract an appropriate investor or investor group.

By providing a mechanism from which a suitable tax and royalty scheme may be created, HB 393 grants the state the power and flexibility needed to maximize the economic benefit of a North Slope gas project.

The development of a North Slope natural gas project will create substantial permanent and temporary jobs for Alaskans. HB 393 addresses the need to have a strong Alaska hire policy for a North Slope gas project.

It is important that measures be taken to address potential impacts that a project may have on local communities. The legislation provides for a socio-economic study to quantify these impacts. The current legislation addresses the issue of revenue sharing with municipalities and we encourage the committee to consider input from all effected parties.

The development of Alaska's stranded natural gas resources would bring great benefits to the people and communities of Alaska. RDC encourages the State Legislature to establish a fiscal and regulatory regime which provides stranded gas projects in Alaska the best possible opportunity to become economically feasible. HB 393 gives the state the ability to accomplish this goal and RDC urges its passage.

Sincerely,

RESOURCE DEVELOPMENT COUNCIL
for Alaska, Inc.

Ken Freeman
Executive Director

Testimony of David Brooks
House Subcommittee on Oil and Gas
February 19 or 24, 1998

David Brooks

Thank you Mr. Chairman

For the record my name is David Brooks and I hold the position of Manager, Alaska Gas for BP Exploration (Alaska) Inc.

In this position I am responsible for managing BP's initiatives to commercialize North Slope gas.

Those initiatives include the possible liquefied natural gas export project and the development of economic technology for the conversion of gas to liquid hydrocarbons, the so called gas-to-liquids technology.

I have been with BP for 23 years and involved in the gas business for 16 years.

Prior to moving to Alaska last November, I was commercial manager of BP's Business Unit in Abu Dhabi in the Middle East where BP is a partner in two oil concessions and a 5 million tonne per year LNG project (the Abu Dhabi Gas Liquefaction Company).

Prior to my assignment in Abu Dhabi, I led the commercial side of BP's participation in the Australian North West Shelf LNG project.

Today, I would like to briefly discuss the proposed Alaska Stranded Gas Development Legislation.

This legislation is clearly the logical next step following the Gas Commercialization Report which was published earlier this year. In passing we would wish to comment that we were encouraged by the Report and pleased to have been able to contribute to its development. For the record we would like to compliment the authors of the Report on a very professional piece of work which addressed the key issues in a what is a complex area.

We also welcomed the opportunity to work with the State's team in developing this legislation and we are supportive of it.

We believe the legislation would offer sponsors of stranded gas projects an opportunity to negotiate fiscal contracts with the State thereby increasing the certainty in respect of the level, methodology, and rules for calculating the State's taxes and royalties over the life of the project.

We believe that the establishment of a fiscal contract between the project sponsors and the State based upon the profitability of the project and the principles set out in the legislation would enhance the international competitiveness of the project and reduce the fiscal risks, one of the key objectives identified by the State's consultant as necessary to improve the economic attractiveness of a North Slope gas development.

We recognize that as the legislation is discussed there may be issues and questions which arise. We look forward to working with the members of the legislature as they consider the merits of this legislation.

Thank you for this opportunity to comment and explain BP's views.

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Alaska Conservation Voice

Speaking Out for Alaska's Future

Juneau
P.O. Box 22151
Juneau, Alaska 99802
phone: 907-463-3366
fax: 907-463-3312
email: unite@akvoice.org

TO: Honorable Members, House Oil and Gas Committee, Alaska State Legislature

FROM: Kay Brown, executive director, Alaska Conservation Voice

DATE: February 25, 1998

SUBJECT: Comments on HB 393 — incentives for stranded gas development

Thank you for the opportunity to comment on HB 393. These comments are submitted on behalf of the Alaska Conservation Voice, a statewide coalition of conservation groups.

The Alaska Conservation Voice supports a fair return for Alaskans from the sale and extraction of public resources.

Therefore, HB 393, proposing incentives to encourage stranded gas development, raises questions:

Is it prudent for the Legislature to authorize open-ended renegotiation of tax and royalty obligations in order to encourage development of as-yet uneconomic gas resources? Is it possible or likely under the scheme proposed that the people of Alaska will receive benefits comparable to what would be obtained without this legislation?

Secs. 1 and 2 of the bill, Findings and Intent, by their nature offer no legal assurance that any renegotiated contract will in fact "fully and fairly compensate the people of the State of Alaska" for the severance of publicly-owned resources or other public costs, including the negative effects and risks that a project could impose on the State.

A shift of payments to the future as proposed entails risks that the Sponsor Group will not be able or willing to meet its future obligations to the State. What if the operation never does become profitable? What if the company has better things to do with its money? What if the leases are assigned to a new party who doesn't honor those old commitments?

We need only to look at the State's recent experience with the Northstar lease renegotiations to see that original contractual commitments may not be honored or considered binding by lessees. In that example, British Petroleum acquired leases through assignment and then refused to honor the net profit bid agreements, which would have deferred payments to the future and given the state a significant share of future net profits. BP has been able to demand new terms as a condition of development, despite prior commitments. Why should these proposed contracts be any more reliable?

Representatives of the administration have stated that any contract proposed would not reduce the state's royalty on gas. Yet, HB 393 proposes broad authority allowing renegotiation of royalty terms [Sec. 43.82.220]. Why is this needed?

What is a "significant share" of a project's economic rent, when discounted to present value, under favorable price and cost conditions [Sec. 43.82.210(b)(6)]? Could this return to the state be less than what the state would receive under the original contract terms and existing tax laws? What happens to the state's share under unfavorable price and cost conditions? How much is a job worth? How much revenue loss is acceptable to get jobs? How do environmental requirements affect the economic rent for purposes of this calculation?

What share of the rent will be deemed "sufficient to compensate the sponsors for risks under a range of economic circumstances"? Looking again at the Northstar renegotiation example, rates of return in excess of 20% from the net profit leases were not adequate to satisfy BP.

Why do municipalities, but not the State, have the option to acquire "an equity or other interest in a project"? What benefits and risks would a municipality incur with an equity share? Should the State also have this option?

Are the municipalities assured that "periodic payments" will be adequate to compensate for the real costs of providing schools, public safety and other services for the influx of workers associated with a big project? Which municipalities will be included?

Which particular items are open to renegotiation is somewhat unclear. Could environmental requirements be dropped through a negotiated contract in order to make a project more economically competitive?

Why should only an aggrieved applicant have standing to seek judicial review? [Sec. 43.82.150] Other people might be legitimately aggrieved, including Alaska citizens and royalty owners, and they should have appeal rights as well.

"Notwithstanding any contrary provisions of AS 38" is a phrase that appears many times in the bill. What precedents would be established in this legislation that could adversely affect other state interests?

Looking at the timeline, how much oil recovery would be lost due to accelerated development of North Slope gas, and how would this affect state revenues? How will this possibility be acknowledged and compensated in the balancing of considerations?

Some have suggested that legislative approval should be part of the process. While that may provide some comfort, Alaska's history with negotiated royalty oil and other contracts indicates that, once a proposal is put forth by the administration and industry sponsors, any changes legislators might suggest are likely to be resisted and difficult to achieve.

The Alaska Conservation Voice urges caution in giving the administration broad authority to change lease terms established by competitive bidding, or to change tax obligations imposed by the Legislature and now uniformly applied. This committee should carefully consider HB 393 in light of legislators' trust responsibilities for public resources and address the questions and issues posed here before moving forward with this bill. We appreciate the committee's deliberative debate thus far, and urge you to look more deeply into these issues.

Thank you for your consideration.

RECEIVED

TONY KNOWLES, GOVERNOR

PLEASE REPLY TO:

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DEPARTMENT OF LAW

OFFICE OF THE ATTORNEY GENERAL

March 13, 1998

Representative Marc Hodgins
Chairman, Special Committee on Oil and Gas
State Capitol Room 110
Juneau, AK 99801-1182

VIA FACSIMILE AND FIRST CLASS MAIL

Re: CSHB 393 (Stranded Gas Development Act)

Dear Representative Hodgins:

At the March 10, 1998, Special Committee on Oil and Gas hearing on CSHB 393 (Stranded Gas Development Act), you asked whether the proposed legislation could go further in requiring Alaska hire without running afoul of the Alaska and U.S.Constitutions. For the reasons set out below, in our opinion the provisions in the legislation before you, with the changes proposed by Commissioner Condon, likely go as far as the courts would allow.

As I briefly discussed at the hearing, the courts have historically found Alaska local hire laws unconstitutional, either under the privileges and immunities clause of the U.S. Constitution or under the equal protection clause of the Alaska Constitution. In *Hicklin v. Orbeck*, 437 U.S. 518 (1978), under the privileges and immunities clause, the U.S. Supreme Court struck down an Alaska local hire law that applied to all employment which was the "result" of state oil and gas leases and required Alaskan residents be hired in preference to nonresidents so long as Alaskans were available. The *Hicklin* court held that employment in the construction industry was a fundamental right entitled to the protection of the privileges and immunities clause, and discrimination against nonresidents would only be permitted if there were a substantial reason justifying the discrimination. The State failed to prove that nonresidents were a "peculiar source of the evil of unemployment."

Following the *Hicklin* decision, the Legislature enacted a narrower local hire statute which required public construction contractors to have a work force that included at least 90% Alaska residents. In *Robison v. Francis*, 713 P.2d 259 (Alaska 1986), the Alaska Supreme Court, again, under the privileges and immunities clause of the U.S. Constitution, held the statute unconstitutional. The court rejected the State's argument that nonresident construction workers were a "peculiar source of unemployment problems in Alaska" because they took construction jobs that would otherwise be taken by Alaska residents. The court upheld the superior court's finding that the nonresidents were no more a peculiar source of unemployment in the construction industry in Alaska than they would be in any other state. *Robison*, 713 P.2d at 266. In addition, the court upheld the superior court's finding that in Alaska there may be many other sources of unemployment -- climatic extremes, the absence of construction activities in rural areas, and the lack of training in rural areas.

Following *Robison*, in 1986, the Legislature amended AS 36.10 to require contractors on public construction projects to give hiring preferences to residents of economically distressed zones. In *State v. Enserch Alaska Constr. Inc.*, 787 P.2d 624 (Alaska 1989), the Alaska Supreme Court held that the hiring preference for economically distressed zones provided for in AS 36.10 violated the equal protection clause of the Alaska Constitution. The court reasoned that the disparate treatment of unemployed workers in one region in order to confer an economic benefit on similarly situated workers in another region is not a legitimate legislative goal. *Enserch*, 787 P.2d at 634.

With the background of these cases, in our opinion it is unlikely that CS HB 393 could contain significantly more substantial, or quantifiable, Alaska Hire provisions without running afoul of the Alaska and U.S. Constitutions. At this time, far in advance of pipeline construction, it would be highly questionable whether one could reasonably establish nonresident workers as a peculiar source of evil, not knowing future employment conditions in the State.

It is our understanding that CS HB 393 contains a new subsection (c) to Section 43.82.230 which would provide that "[s]ubject to the voluntary agreement of the qualified sponsors the commissioner may include a term in the contract providing for incentives to encourage training and hiring of Alaska residents." As I briefly discussed at the hearing, for a variety of reasons, a sponsor may, in a manner similar to the Northstar example, voluntarily commit to substantive Alaska hire goals that the State may not mandate through legislation. Moreover, these incentives would be more contemporaneous with pipeline construction and could, presumably, be more closed tailored to addressing future employment conditions in the State. Therefore, this proposed language may help address your concern that the legislation contains the tools by which the State may obtain more solid assurances of Alaska hire.

I hope this letter addresses your questions. If you have additional questions or concerns, please let me know.

Very truly yours,

BRUCE M. BOTELHO
ATTORNEY GENERAL

By:
Lawrence Z. Ostrovsky
Assistant Attorney General
Oil, Gas & Mining Section

cc: Commissioner Condon
Pat Pourchot
Jack Griffin
Ed Flanagan
Mary Marshburn

LZO/mb

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P.O. Box 190288
Anchorage, Alaska 99519-0288
e-mail: <rfbarnes@alaska.net>
(907) 264-3681

Richard F. Barnes
President

March 17, 1998

Special Committee on Oil and Gas
Alaska House of Representatives

Dear Committee members:

Re: HB 393

ENSTAR Natural Gas has great concern about the present language of HB 393.

In the findings of Section 1, line 22 the bill discounts any significant need for North Slope gas besides export. However, the North Slope Gas Commercialization Team said in its (October 1, 1997) report that Southcentral Alaska may face natural gas shortages as soon as 2004. Our consultants and Unocal reached similar conclusions, especially if gas exports continue to Japan from the Kenai LNG plant based on Cook Inlet supplies.

We are concerned that Anchorage, Mat-Su and Kenai are being cut out of access to North Slope gas. The bill gives power to a commissioner to enter a contract with a project sponsor that withdraws the right of the state to take royalty gas in kind. In turn, the project sponsor must make "gas available to meet reasonably foreseeable demand in this state for gas within proximity of the project." (Sec. 43.82.010, line 18-20) This language appears in multiple locations in the bill. This concept may cover Fairbanks, Glennallen and Valdez, which presumably are "within proximity of the project." It does not appear to recognize the importance to the 97,000 homes and businesses, representing over half the population of the state, that may need to depend on North Slope gas for energy security. Nor does it address the needs of continued supply to the electricity-generating utilities, the ammonia-urea plant at Kenai, the LNG plant at Kenai or any economic development that may depend on gas.

We applaud the state's effort to encourage construction of a gas pipeline from the North Slope to a southern terminus. However, what may be the most advantageous approach for the project sponsors could be contrary to the best interests of the majority of Alaska's population. If the project sponsors control the working interest and the royalty interest from the North Slope, there may be no gas for domestic use. To legislate such an outcome would be bad public policy. We ask that you not pass HB 393 out of committee without correcting this problem.

Very truly yours,

R F Barnes

ALASKA STATE CHAMBER OF COMMERCE

Resolution 98-12

Development of Stranded Alaska North Slope Gas

WHEREAS, Alaska has at least 26 trillion cubic feet of natural gas resources in the Prudhoe Bay field and five to ten trillion cubic feet of additional natural gas resources in other North Slope fields; and

WHEREAS, these natural gas resources are currently stranded, without a transportation means to reach a market; and

WHEREAS, possible favorable conditions for the sale of North Slope gas to Pacific Rim markets beginning after 2005 may exist; and

WHEREAS, the Alaska Legislature recently expressed their support for intensified activities to advance economic North Slope gas sales through their unanimous passage of House Concurrent Resolution No. 1; and

WHEREAS, the Alaska State Chamber also recognizes that the petroleum industry is developing technologies which may offer other alternatives to produce the gas in the future; and

WHEREAS, the Alaska State Chamber believes commercial development of stranded natural gas from the North Slope and the construction of associated facilities would greatly benefit the future economic health of the State of Alaska, its local governments and private enterprise; and

WHEREAS, the Alaska State Chamber supports the commercial development of natural gas from the North Slope including the construction and operation of the associated facilities;

THEREFORE, BE IT RESOLVED that the Alaska State Chamber urges the Governor and the Alaska State Legislature to continue to take those steps, particularly to provide a stable and appropriate fiscal and regulatory environment, which will give an Alaska stranded gas project the best opportunity to become commercially viable, thus enabling the earliest possible development of the resource.

ADOPTED

December 5, 1997

BY Pamela LaBolle
Pamela La Bolle
President

BY David W. Marquez
David Marquez
Chairman, Board of Directors

RESOLUTION NO. 98-18

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF VALDEZ, ALASKA, SUPPORTING THE FIVE (5) YEAR TAX EXEMPTION PROPOSED BY THE MAYORS OF THE FAIRBANKS NORTH STAR BOROUGH, NORTH SLOPE BOROUGH, CITIES OF FAIRBANKS, NORTH POLE AND VALDEZ FOR THE CONSTRUCTION OF THE TRANS-ALASKA GAS PIPELINE

WHEREAS, plans for a Trans-Alaska gas pipeline have been discussed and debated for many years in Alaska; and

WHEREAS, owners of the Trans-Alaska Gas Pipeline project are pursuing the construction of a natural gas pipeline; and

WHEREAS, the municipalities of Fairbanks North Star Borough, North Slope Borough, Cities of Fairbanks, North Pole and Valdez have recognized the importance of the construction of a natural gas pipeline; and

WHEREAS, the Mayors from these municipalities have agreed to offer up to a five (5) year tax exemption to the owners of the Trans-Alaska Gas Pipeline; and

WHEREAS, in exchange for this exemption, the Mayors propose that the municipalities involved would take an ownership position proportionate to the dollar value of the exempted taxes for the proposed five (5) year period; and

WHEREAS, the State of Alaska and other interested parties supporting the construction of a Trans-Alaska gas pipeline have stated that to be economically viable, a "tax holiday" would need to take place during construction as there would be little or no cash flow during that phase; and

WHEREAS, gas line take-offs would be expected so that each of these municipalities would have natural gas distributed to its citizens and businesses; and

WHEREAS, the Mayors of the affected municipalities find this a reasonable position and in the best interest of those communities involved by providing a less expensive form of energy to their citizens and will provide considerably cleaner emissions produced through combustion which will significantly affect air quality; and

WHEREAS, the State of Alaska is on record as stating that a tax exemption of some sort is necessary to move a gas line project to reality and would have to offer similar concessions for that part of the pipeline not located in an organized municipality; and

WHEREAS, through a small financial ownership interest by the municipalities in the pipeline, the revenue stream produced for at least the next fifty (50) years would diminish the amount of taxes exempted at the "front end" of the project; and

WHEREAS, this is a very positive approach to solving one of few remaining obstacles to construction of the gas line and creates a government/business partnership that is in the interest of the public and demonstrates flexibility from municipalities that show them to be part of a solution rather than part of a problem.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Valdez, Alaska, strongly supports the plan put forth by the Mayors of those municipalities involved and requests the Legislature and the Governor to support the plan by providing the same tax incentives in the unorganized areas of the State that would be affected.

PASSED AND APPROVED this 17th day of February, 1998.

David C. Cobb

David C. Cobb, Mayor

ATTEST:

Sheri L. Caples, CMC, City Clerk

SEAL OF THE CITY OF VALDEZ, ALASKA INC. 1901

PROPOSED AMENDMENTS TO HB 393 BY PIPELINE MAYORS

1. The Commissioner has the power to defer municipal taxes - not exempt pipeline owners from them.

2. The taxes may be deferred for a maximum of 5 years from the first year in which the taxes could have been collected.

3. The agreement must provide that any deferred taxes be repaid with interest (at the long bond rate calculated as of January 1) during the first five years after the period of deferment.

4. Municipalities that defer taxes must be able to issue bonds up to the amount necessary to accommodate expenditures required to be made by the municipality as a result of the impact of the project. The bonds must be guaranteed by the State of Alaska.

5. No deferrals of property taxes may be permitted for facilities which are presently subject to the ad valorem property tax.

6. The deferral of taxes may only apply to (1) projects that require construction of a Trans-Alaska natural gas pipeline; and (2) facilities in existence during the initial exemption period.

7. Communities in proximity to the pipeline must have guaranteed access to gas at a price equal to the wellhead value plus the allocated transportation costs to the pipeline connection.

MAYOR DAVID C. COBB	MAYOR HANK HOVE	MAYOR BENJAMIN NAGEAK
City of Valdez	Fairbanks North Star Borough	North Slope Borough

advance and with as much certainty as the Constitution of the State of Alaska allows; 1 and 2

(3) maximize the benefit to the people of the state of the development 3 of the state's stranded gas. 4

Sec. 43.82.020. Contracts for payments in lieu of other taxes and for 5 royalty adjustments. The commissioner may, under this chapter, enter into a contract 6 with a qualified sponsor or qualified sponsor group providing for (1) periodic payment 7 in lieu of one or more taxes that otherwise would be imposed by the state [OR A 8 MUNICIPALITY] upon the qualified sponsor or members of the qualified sponsor group as 9 a consequence of the sponsor's or group's participation in an approved qualified 10 project under this chapter; and (2) certain adjustments regarding royalty under 11 AS 43.82.220. 12

Article 2. Qualification and Application Procedures. 13

Sec. 43.82.100. Qualified project. Based on information available to the 14 commissioner, the commissioner may determine that a proposal for new investment is 15 a qualified project under this chapter only if the project 16

(1) would produce at least 500 billion cubic feet of stranded gas within 17 20 years from the commencement of commercial operations; and 18

(2) [IS CAPABLE, SUBJECT TO APPLICABLE COMMERCIAL REGULATION AND TECHNICAL AND ECONOMIC CONSIDERATIONS, OF MAKING] would make gas available in sufficient quantities to meet reasonably foreseeable [DEMAND IN THIS STATE FOR GAS] present and future needs of communities within proximity to the project at a price equal to the wellhead value plus the allocated transportation costs to the pipeline connection.19

Sec. 43.82.110. Qualified sponsor or qualified sponsor group. The 22 commissioner may determine that a person or group is a qualified sponsor or qualified 23 sponsor group if the person or a member of the group 24

(1) intends to own an equity interest in a qualified project or commit 25 gas that it owns to a qualified project; and 26

(2) meets one or more of the following criteria: 27

(A) owns a working interest in at least 10 percent of the 28 stranded gas proposed to be developed by a qualified project; 29

(B) has the right to purchase at least 10 percent of the stranded gas proposed to be developed by a qualified project;

Sec. 43.82.180. Withdrawal of applications. Subject to the terms of a reimbursement agreement under AS 43.82.240 or other agreement with the Department of Revenue, the Department of Natural Resources, the commissioner of revenue, or the commissioner of natural resources affecting the withdrawal of an application, a qualified sponsor or qualified sponsor group may withdraw an application submitted under AS 43.82.120 at any time before the date that the commissioner of revenue enters into a contract under AS 43.82.430 without further obligation under this chapter.

Article 3. Contract Development.

Sec. 43.82.200. Contract development. If the commissioner of revenue approves an application and proposed project plan under AS 43.82.140, the commissioner may develop a contract under AS 43.82.020 that may include

(1) terms concerning periodic payment in lieu of one or more taxes as provided in AS 43.82.210;

(2) terms developed under AS 43.82.220 relating to

(A) timing and notice of the state's right to take royalty in kind or in value; or

(B) royalty value;

(3) terms regarding Alaska hire and Alaska contracting under AS 43.82.230;

[(4) TERMS REGARDING PERIOD PAYMENT TO, OR AN EQUITY OR OTHER INTEREST IN A PROJECT FOR, MUNICIPALITIES UNDER AS 43.82.500;]

(4) terms regarding arbitration or alternative dispute resolution procedures;

(5) terms and conditions for administrative termination of a contract under AS 43.82.440; and

(6) other terms or conditions that are

(A) necessary to further the purposes of this chapter; or

(B) in the best interests of the state.

Sec. 43.82.210. Contract terms relating to payment in lieu of one or more state taxes. (a) If the commissioner of revenue approves an application and proposed project plan under AS 43.82.140, the commissioner may develop proposed terms, for

inclusion in a contract under AS 43.82.020, for periodic payment in lieu of one or 1
more of the following taxes that otherwise would be imposed by the state [OR A 2
MUNICIPALITY] upon the qualified sponsor or a member of the qualified sponsor group 3
as a consequence of participating in an approved qualified project: 4

(1) oil and gas production taxes and oil surcharges under AS 43.55; 5

(2) oil and gas exploration, production, and pipeline transportation 6
property taxes under AS 43.56; 7

(3) oil and gas conservation tax under AS 43.57; 8

(4) Alaska net income tax under AS 43.20; 9

**[(5) MUNICIPAL SALES AND USE TAX UNDER AS 29.45.650 -29.45.680 OR 10
29.45.700 - 29.45.710;] 11**

**[(6) MUNICIPAL PROPERTY TAX UNDER AS 29.45.010 - 29.45.250 OR 12
29.45.550 - 29.45.600;] 13**

[(7) MUNICIPAL SPECIAL ASSESSMENTS UNDER AS 29.46;] 14

(5) a comparable tax or levy imposed by the state **[OR A MUNICIPALITY]** 15
after the effective date of this bill section; 16

(6) other state taxes **[OR MUNICIPAL TAXES]** or categories of state taxes
identified by 17
the commissioner. 18

(b) If the commissioner chooses to develop proposed terms under (a) of this 19
section, the commissioner shall, if practicable and consistent with the long-term fiscal 20
interests of the state, develop the terms in a manner that attempts to balance the 21
following principles: 22

(1) the terms should, in conjunction with other factors such as cost 23
reduction of the project, cost overrun risk reduction of the project, and increased fiscal 24
certainty and successful marketing, improve the competitiveness of the approved 25
qualified project in relation to other development efforts aimed at supplying the same 26
market; 27

(2) the terms should accommodate the interests of the state, **[THE AFFECTED 28
MUNICIPALITIES,]** and the project sponsors under a wide range of economic conditions, 29
potential project structures, and marketing arrangements; 30

(3) the state's **[AND AFFECTED MUNICIPALITIES' COMBINED]** share of the 31

approved qualified project's economic rent under the contract should be relatively progressive; that is, the state's [AND AFFECTED MUNICIPALITIES' COMBINED] annual share of the approved qualified project's economic rent generally should not increase when there are decreases in project profitability, or decrease when there are increases in project profitability;

(4) the state's [AND AFFECTED MUNICIPALITIES COMBINED] share of the approved qualified project's economic rent under the contract should be relatively lower in the earlier years than in the later years of the approved qualified project;

(5) the terms should allow the project sponsors to retain a share of the approved qualified project's economic rent that is sufficient to compensate the sponsors for risks under a range of economic circumstances;

(6) the terms should provide the state [AND AFFECTED MUNICIPALITIES] with a significant share of the approved qualified project's economic rent, when discounted to present value, under favorable price and cost conditions;

(7) the method for calculating the periodic payment in lieu of certain taxes under the contract should be clear and unambiguous; and

(8) while cost calculations for the approved qualified project under the contract should be based on amounts that closely approximate actual costs, agreed-upon formulas reflecting reasonable economic assumptions should be used if possible to promote administrative certainty and efficiency.

(c) Except as provided in (b) of this section, the commissioner's discretion under this section in developing proposed terms for a contract under AS 43.82.020 is not limited to consideration of the approved qualified project's economic rent.

Sec. 43.82.215. Contract terms relating to deferment of municipal taxes and assessments.

(a) If the commissioner of revenue approves an application and proposed project plan under AS 43.82.140, the commissioner may develop proposed terms for inclusion in a contract under AS 43.82.020 for deferment of municipal property taxes under AS 29.45.10 - 29.45.250 or 29.45.550 - 29.45.600 that otherwise would be imposed by a municipality upon the qualified sponsor or a member of the qualified sponsor group as a consequence of participating in an approved qualified project.

(b) Any deferments of municipal property taxes are subject to the following limitations which must be set out in the agreement

(1) the deferment may not exceed five years from the date the taxes were due and payable on any portion of the project.

(2) all deferred taxes must be repaid with interest calculated (at the Consumer Price Index calculated as of January 1 of each tax year) in equal annual installments during the first five years after the period of deferment.

(3) property taxes may not be deferred on facilities which are subject to taxes under AS 29.45.010 - 29.45.250 or 29.45.550 - 29.45.600 on the effective date of a contract under this chapter.

(4) property taxes may be deferred on only (1) property required for construction and operation of a Trans-Alaska natural gas pipeline; and (2) facilities that are constructed during the initial deferment period.

Sec. 43.82.218. Issuance of municipal bonds. Municipalities whose taxes have been deferred may issue bonds up to the amount necessary to accommodate expenditures required to be made by the municipality as a result of the impact of the project. The payment of principle and interest on such bonds shall be guaranteed by the State of Alaska in the event that the project sponsors fail to pay the full amount of the deferred taxes.

Sec. 43.82.220. Contract terms relating to royalty. (a) Notwithstanding any 24
contrary provisions of AS 38, the commissioner of natural resources, with the 25
concurrence of the commissioner of revenue and the affected parties holding a state 26
lease or unit agreement, may develop proposed terms, for inclusion in a contract under 27
AS 43.82.020, that modify the timing and notice provisions of the applicable oil and 28
gas leases and unit agreements pertaining to the state's rights to receive its royalty in 29
kind or in value, if 30

(1) the viability of the approved qualified project depends upon long- 31

[ARTICLE 6. PAYMENT TO MUNICIPALITIES; EQUITY OR 1
OTHER PARTICIPATION BY MUNICIPALITIES. 2

SEC. 43.82.500. PAYMENT TO MUNICIPALITIES; EQUITY OR OTHER PARTICIPATION BY 3
MUNICIPALITIES. (A) IF THE COMMISSIONER EXECUTES A CONTRACT UNDER AS 43.82.020 THAT 4
INCLUDES TERMS THAT EXEMPT A PARTY TO THE CONTRACT, AND THE PROPERTY, GAS, PRODUCTS, AND 5
ACTIVITIES ASSOCIATED WITH THE APPROVED QUALIFIED PROJECT THAT IS SUBJECT TO THE CONTRACT, 6
FROM A MUNICIPAL TAX IN ACCORDANCE WITH AS 29.45.810, AS 29.46.010(B), 7
AS 43.82.200, AND 43.82.210, THE COMMISSIONER SHALL REQUIRE, AS A CONDITION OF THE 8
CONTRACT, THAT THE PARTY INSTEAD MAKE PERIODIC PAYMENT TO THE AFFECTED MUNICIPALITY IN 9
A FAIR AND REASONABLE AMOUNT AS DETERMINED BY THE COMMISSIONER UNDER (B) OF THIS 10
SECTION. 11

(B) AFTER CONSULTATION WITH THE AFFECTED MUNICIPALITY, THE COMMISSIONER SHALL 12
DETERMINE THE AMOUNT OF PAYMENT DUE UNDER (A) OF THIS SECTION. IN MAKING THE 13
DETERMINATION REQUIRED BY THIS SUBSECTION, THE COMMISSIONER SHALL 14

(1) ESTIMATE THE TOTAL OPERATING AND CAPITAL COSTS OF ADDITIONAL SERVICES 15
AND CONSTRUCTION THAT WOULD BE PROVIDED AND PAID FOR BY THAT MUNICIPALITY DURING THE 16
TERM OF THE CONTRACT UNDER AS 43.82.020 AS A RESULT OF THE CONSTRUCTION AND OPERATION 17
IN THE MUNICIPALITY OF THE APPROVED QUALIFIED PROJECT THAT IS SUBJECT TO THE CONTRACT; AND 18

(2) AMORTIZE THE TOTAL COSTS ESTIMATED UNDER (1) OF THIS SECTION OVER THE 19
TERM OF THE CONTRACT OR A PORTION OF THE TERM OF THE CONTRACT. 20

(C) IN LIEU OF PAYMENTS UNDER (A) OF THIS SECTION, THE COMMISSIONER, WITH THE 21
CONCURRENCE OF THE MUNICIPALITY, MAY INCLUDE A TERM IN A CONTRACT UNDER AS 43.82.020 22
THAT PROVIDES THE MUNICIPALITY WITH AN EQUITY OR OTHER INTEREST IN THE APPROVED QUALIFIED 23
PROJECT THAT IS SUBJECT TO THE CONTRACT.] 24

Article 7. Miscellaneous Provisions. 25

Sec. 43.82.600. Governing law. If a provision of this chapter conflicts with 26 another provision of state or municipal law, the provision of this chapter governs. 27

Sec. 43.82.610. Regulations. The commissioner of revenue, the commissioner 28 of natural resources, and the commissioner of labor may adopt regulations to carry out 29 their respective duties under this chapter. 30

Sec. 43.82.620. Procedures for collection of amounts due; security. (a) 31

CSHB 393 Flow Chart

The Alaska Stranded Gas Development Act

Defined terms

What is STRANDED GAS?

Gas that is uneconomic or uncompetitive to develop.

What is a QUALIFIED PROJECT?

A project that would develop and market 500 bcf if STRANDED GAS over a twenty year period and make gas available to local communities.

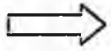
What does it take to be a QUALIFIED SPONSOR?

An intent to own an equity interest in the project and

1. Own some or all of the stranded gas; or
2. Have a right to purchase some of the stranded gas; or
3. Have the major permits necessary to construct the project; or
4. Have the financial strength to construct the project.

Project Sponsors Apply

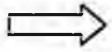
A QUALIFIED SPONSOR may apply to the Commissioner of Revenue for a contract to make payments in lieu of certain state and local taxes for a QUALIFIED PROJECT to develop STRANDED GAS



Project Sponsors Requirements

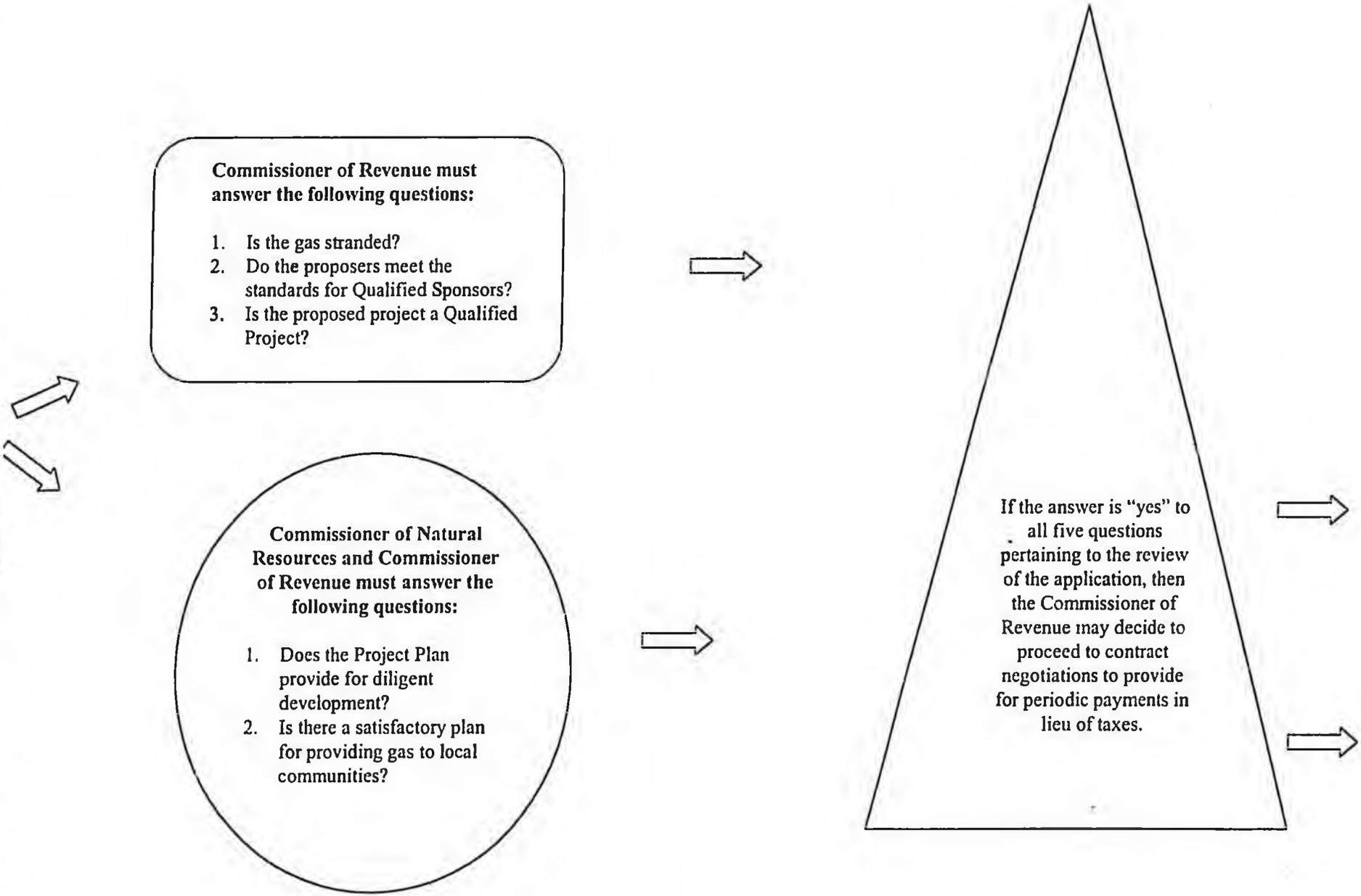
Proposed project sponsors applying for a contract must establish:

1. That gas is stranded gas.
2. That they are Qualified Sponsors.
3. That the proposed project is a Qualified Project.
4. That there is a Project Plan that reflects a proposal for diligent development of the gas, and includes reasonable provisions for providing gas to local communities.



Commissioners of Revenue and Natural Resources Review Application

Parties May Proceed to Contract Negotiation Upon Commissioner of Revenue's Approval of the Application for a Contract



The Commissioner of Revenue and the Commissioner of Natural Resources Negotiate a Contract with Sponsors that Provides for Payments in Lieu of Certain Taxes, Alaska Hire, Certain Royalty Arrangements, Gas for Communities and Revenue Sharing with Communities

The Commissioner of Revenue may, with respect to contract fiscal terms, develop payments in lieu of certain state or municipal oil and gas, income, property, or other taxes. Fiscal terms shall:

1. Improve the competitiveness of the Alaska project
2. Function effectively under a wide range of economic and market conditions
3. Link the State's share to project profitability (make tax "progressive")
4. Make State's share "backend loaded"-lower tax rates in earlier years, higher rates in later years
5. Allow Sponsor a share of the project's return commensurate with the Sponsor's assumed risk
6. Have the State's share increase under favorable price and cost conditions
7. Be clear and unambiguous
8. Base payment terms on actual costs if possible, or formulae

In addition to fiscal terms, the contract shall also:

1. Provide for Alaska Hire within the limits of Constitutional restrictions
2. Provide gas for Alaska communities
3. Provide for a fair and reasonable sharing of revenue with affected communities. Development of municipal revenue sharing terms shall be based on the following:

   i. The size of the tax base that would be exempted
   ii. The anticipated economic and social burdens imposed on a municipality from a project
   iii. The need for stable and predictable payments
   iv. The eight fiscal principles outlined above.

With the concurrence of the Commissioner of Revenue, the Commissioner of Natural Resources may negotiate terms to include in the contract that:

A. Provide for a method for valuing the gas for royalty purposes; and
B. Modify the rights of the State to take royalty in-kind rather than in-value.

The Commissioner of Revenue notifies the mayors of the affected communities and they establish the Municipal Advisory Group. One member from each affected community is appointed to serve on the group. The Commissioner of Revenue must:

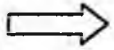
1. Consult with the Municipal Advisory Group on the development of municipal revenue sharing terms
2. Consult with the Municipal Advisory Group about issues affecting the communities during negotiations.

The Commissioner of Revenue Completes Contract and Makes Preliminary Findings

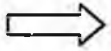
Public and Legislature Review Proposed Contract

Commissioner of Revenue completes contract and makes preliminary findings and a determination that the contract is in the long term fiscal interests of the State. With an affirmative finding the Commissioner shall:

1. Submit the contract to the Governor.
2. Make the findings, contracts and supporting data available for public and legislative review



A period of at least 30 days begins for the public and the legislature to review and comment upon the proposed contract and findings.



The Commissioner of Revenue Reviews the Contract in Light of Public Comment and May Seek to Amend the Contract

The Commissioner of Revenue prepares a summary of public comments. After consultation with the Commissioner of Natural Resources and the Municipal Advisory Group, the Commissioner of Revenue:

1. May develop proposed amendments to the contract and attempt to secure Sponsor agreement to the proposed amendments
2. Make final findings and a determination that the contract is in the long term fiscal interest of the State.

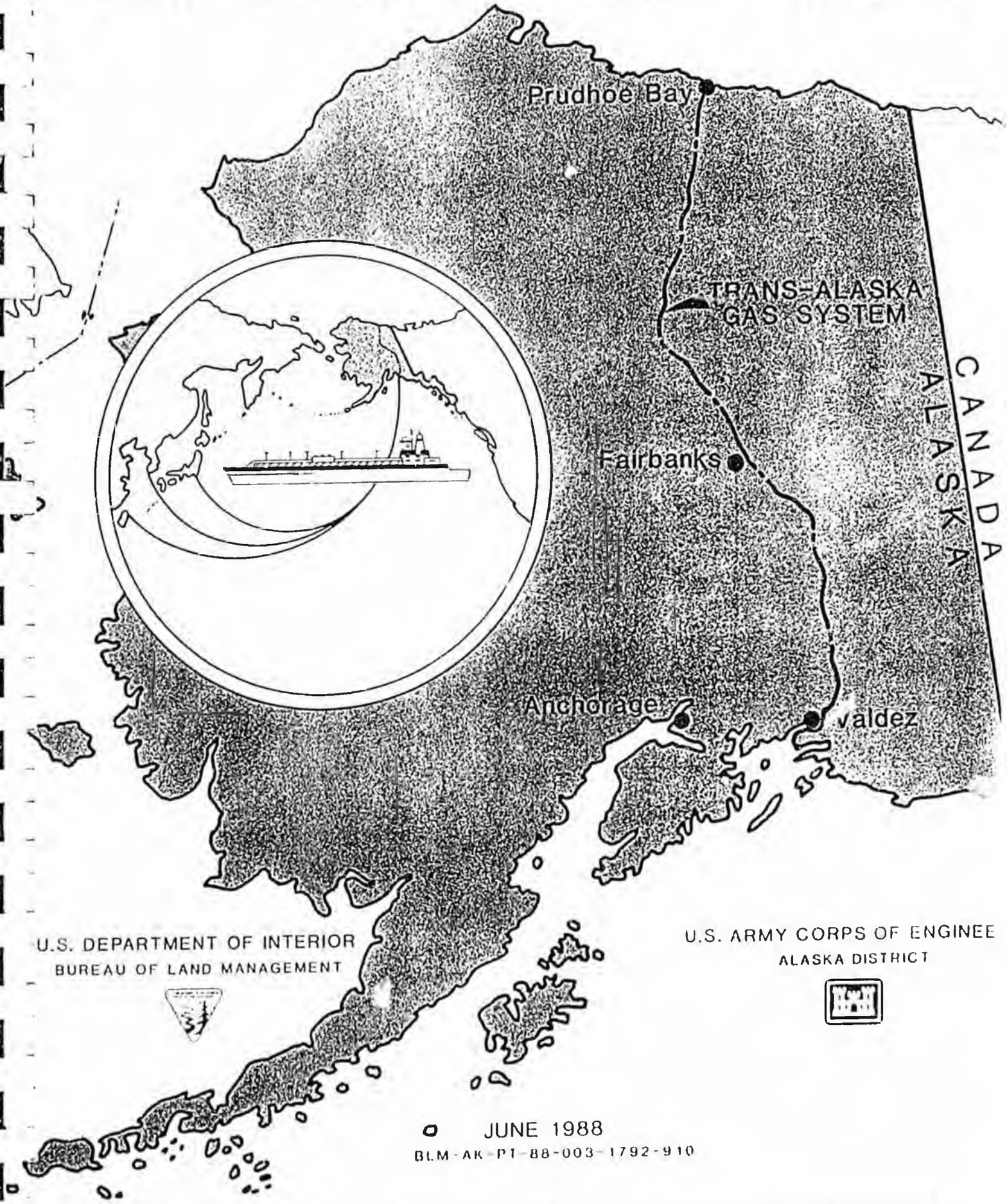
The Legislature Considers Legislation to Authorize the Executive Branch to Execute the Contract

The Commissioner submits the proposed contract and final findings to the Governor. The Governor submits the findings and proposed contract together with a bill requesting authority to execute the contract to the legislature.

The Executive Branch and the Sponsors Execute the Contract

If the legislature grants the executive branch the authority to execute the contract, then the Governor must do so within 60 days of the effective date of the authorizing legislation.

TRANS-ALASKA GAS SYSTEM
FINAL ENVIRONMENTAL IMPACT STATEMENT



U.S. DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT

U.S. ARMY CORPS OF ENGINEE
ALASKA DISTRICT

JUNE 1988
BLM-AK-PT-88-003-1792-910

HARDING LAWSON ASSOCIATES • 601 EAST 57TH PLACE • ANCHORAGE, ALASKA 99518

Bureau of Land Management
Department of the Interior
U.S. Army Corps of Engineers
Department of the Army

FINAL
ENVIRONMENTAL IMPACT STATEMENT
FOR THE PROPOSED
TRANS-ALASKA GAS SYSTEM

Prepared by
Bureau of Land Management
and
U.S. Army Corps of Engineers

Cooperating Agencies

Department of Agriculture
Forest Service

Department of Commerce
National Marine Fisheries Service

Department of Energy
Economic Regulatory Administration

Department of the Interior
Bureau of Indian Affairs
Bureau of Mines
Fish and Wildlife Service
Geological Survey
Minerals Management Service
National Park Service

Department of Transportation
Coast Guard
Federal Highway Administration
Office of Pipeline Safety

Environmental Protection Agency

Federal Energy Regulatory Commission

State of Alaska
Division of Governmental Coordination
Department of Fish and Game
Department of Natural Resources
Department of Transportation and Public Facilities
Department of Environmental Conservation

JUNE 1988
BLM-AK-PT-88-003-1792-910

Michael J. Penfold, Alaska State Director, Bureau of Land Management

Col. Wilbur T. Gregory Jr., District Engineer, Alaska District,
U.S. Army Corps of Engineers

COVER SHEET

PROPOSED TRANS-ALASKA GAS SYSTEM

(X) Final

Lead Agencies:

U.S. Department of the Interior
Bureau of Land Management
Alaska State Office

U.S Army Corps of Engineers
Alaska District, Regulatory Branch

Cooperating Agencies:

Department of Agriculture
- Forest Service

Department of Commerce
- National Marine Fisheries Services

Department of Energy
- Economic Regulatory Administration

Department of the Interior
- Bureau of Indian Affairs
- Bureau of Mines
- Fish and Wildlife Service
- Geological Survey
- Minerals Management Service
- National Park Service

Department of Transportation
- Coast Guard
- Federal Highway Administration
- Office of Pipeline Safety

Environmental Protection Agency

Federal Energy Regulatory Commission

Office of the Federal Inspector

State of Alaska
- Division of Governmental Coordination
- Department of Fish and Game
- Department of Natural Resources
- Department of Transportation and Public Facilities
- Department of Environmental Conservation

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Anchorage, Alaska 99513-0099

ABSTRACT

YUKON PACIFIC CORPORATION (YPC) PROPOSES TO CONSTRUCT THE TRANS-ALASKA GAS SYSTEM (TAGS) AS A 796.5 MILE LONG, BURIED, CHILLED, HIGH PRESSURE, 36-INCH OUTER DIAMETER NATURAL GAS PIPELINE BETWEEN PRUDHOE BAY AND A TIDEWATER TERMINAL AND LNG PLANT AT ANDERSON BAY. THE ENTIRE PROJECT IS LOCATED IN ALASKA. TEN COMPRESSOR STATIONS WOULD BE BUILT AT REGULAR INTERVALS ALONG THE PIPELINE. OPERATIONS AND CONTROL CENTER FOR THE TAGS PROJECTS WOULD BE IN VALDEZ; HEADQUARTERS AND ADMINISTRATION IN ANCHORAGE, AND MAINTENANCE IN FAIRBANKS. THE PROPOSED TAGS CLOSELY PARALLELS THE EXISTING TRANSALASKA OIL PIPELINE SYSTEM IN ITS ENTIRETY AND A PORTION OF THE AUTHORIZED BUT UNCONSTRUCTED ALASKA NATURAL GAS TRANSPORTATION SYSTEM. UP TO 2.3 BILLION CUBIC FEET OF CONDITIONED NATURAL GAS PER DAY WOULD BE MOVED THROUGH TAGS FOR LIQUIFICATION AND EXPORT BY TANKER TO JAPAN, TAIWAN AND KOREA. YPC ESTIMATES THAT TAGS HAS THE CAPABILITY TO REDUCE THE U.S. BALANCE OF TRADE DEFICIT BY $2.5 BILLION ANNUALLY AT FULL OPERATION.

THE FEIS ANALYZES CONSTRUCTION AND OPERATION OF THE PROPOSED TAGS, AN ALTERNATIVE ROUTING TO COOK INLET, AND THE ALTERNATIVE OF NO-ACTION.

THIS FEIS HAS BEEN PREPARED ACCORDING TO THE REQUIREMENTS OF THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (NEPA) AND REGULATIONS FOR IMPLEMENTING NEPA.

THIS FEIS SERVES AS A NEPA COMPLIANCE DOCUMENT FOR THE U.S. ARMY CORPS OF ENGINEERS, AND BUREAU OF LAND MANAGEMENT, ECONOMIC REGULATORY ADMINISTRATION AND FEDERAL ENERGY REGULATORY COMMISSION.

CONTENTS

NOTE: All modifications to the DEIS which are incorporated into the FEIS are in bold italics, or in bold.

CONTENTS (Contd)

CONTENTS (Contd)

CONTENTS (Contd)

SECTION 4.0 ENVIRONMENTAL CONSEQUENCES (Contd)

CONTENTS (Contd)

CONTENTS (Contd)

APPENDICES[1/]

ALIGNMENT MAPS

SEE PAGE viii FOR FOOTNOTES

1/ Other than Appendix I (supplemental), L (supplemental), N, and O, all others would be identical to those included in the DEIS and are not reproduced again in the FEIS. They are hereby incorporated by reference. Appendix I (supplemental), L (supplemental), N, and O are included in this document.

2/ On June 6, 1988, the Northwest Alaskan Pipeline Company issued a press release about a future potential for modification to the ANGTS project as described in Appendix B of the DEIS. These prospective modifications are summarized as follows: 1) make greater use of snow/ice construction in Alaska where possible; 2) shorten the overall construction schedule by greater use of winter construction; 3) revise the mix of previously approved construction methodology; 4) increase the flow of natural gas throughout from 2.1 BCFD to 2.3 BCFD; 5) decrease pipe diameter in the Alaska segment from 48 inches to 42 inches; 6) increase operating pressure from 1,260 psig to 2,160 psig; 7) reduce the number of compressor stations; 8) reduce the number of other related facilities. On June 8, 1988, a representative of Northwest Alaska Pipeline Company indicated there were no firm plans at this time as to when remobilization of ANGTS would start or when the modifications would be submitted for Federal review/approval. Although detailed technical information is not yet available on the potential June 6, 1988 ANGTS modifications, the overall cumulative effects described in this FEIS are based upon the assumption that ANGTS will be constructed. The FEIS appears to still represent a reasonable estimate of cumulative effects; if anything, the overall thrust of the prospective ANGTS modifications would cause a letter degree of total cumulative effect.

3/ Appendix D has been deleted at the request of EPA since there is substantial uncertainty on the process and design of a gas conditioning facility at Prudhoe Bay needed to provide LNG quality natural gas to TAGS. Prior NEPA evaluations and an expired PSD analysis may not be transferrable or may not be appropriate for TAGS (EPA 1988a).

FIGURES

FIGURES (Contd)

TABLES

TABLES (Contd)

gas (methane). Should the LPG Project be developed, it is probable that the operating pressures of existing TAPS facilities would be converted to a higher pressure system. The increased operating pressure of TPAS still would not handle two-phase flow. Therefore, this alternative is not considered a viable option to the proposed action.

1.9.2.2 Convert Natural Gas to a Liquid at Prudhoe Bay and Comingle with Crude Oil in TAPS

During the public scoping process *and again during review of the DEIS*, a suggestion was made to convert natural gas to a liquid at Prudhoe Bay and then use the existing TAPS to transport both oil and gas to Valdez.

This alternative is possible only to the extent the natural gas, as a liquid, would be compatible with the operating potentials of the TAPS crude oil delivery system.

Natural gas liquids (NGLs) comprise a group of hydrocarbons that occur naturally in gaseous form or in solution with oil in a reservoir. NGLs are recoverable as liquids by condensation or absorption processes.

The average composition of gas reinjected in the Prudhoe Bay reservoir is shown in Table 1.9.2-1.

TAPS was designed to transport large volumes of crude oil. The maximum temperature of the oil when injected into the pipeline is 145°F. The design operating pressure of the pipeline is 1180 psi.

Through addition of long chain polymers *(which lower the viscosity and reduce the friction factor)* and project modifications, Alyeska Pipeline Service Company has determined the present 145°F injection temperature for TAPS can be lowered to about 110° to 111°F. At this lowered temperature, and at atmospheric pressure, approximately 40,000 barrels more of NGLs (as a liquid) can be comingled daily with the crude oil in TAPS. Methane, the principal component of the feed gas for the proposed TAGS project, is a gas at these temperatures and pressures; and, therefore, is not compatible with the design of TAPS. At a temperature of -259°F, liquid natural gas (LNG) is not compatible with the TAPS design or operating requirements.

Table 1.9.2-1

Composition of Gases Reinjected in Prudhoe Bay Reservoir Since 1978

Constituent	Average Reinjected Since 1978 (Percent Volume)[1]
N_2 (nitrogen)	.48
CO_2 (carbon dioxide)	12.77
C_1 (methane)	73.72
C_2 (ethane)	6.97
C_3 (propane)	3.56
iC_4 (iso-butane)	.48
nC_4 (normal butane)	1.15
iC_5 (iso-pentane)	.23
nC_5 (normal-pentane)	.29
C_{6+} (hexanes and heavier)	.37
	100.20%[2]

1 (Personal communication - R. Douglass, February 1987).

2 Does not add to 100 percent because of rounding within constituent averages.

Accordingly, the option of converting natural gas to a liquid to be comingled with crude oil in TAPS is not considered a practicable alternative to TAGS.

1.9.3 Regional Pipeline/LNG Plant Alternatives Screening

The initial screening considered alternative pipeline routes and LNG plants in various regions of Alaska. This analysis concluded that only the Cook Inlet and Prince William Sound areas provided feasible alternatives for the pipeline, LNG plant, and marine terminal (see Appendix C). In western Alaska limited tanker access related to sea ice as well as other factors eliminated the region from further consideration. Pipeline distance to Yakutat or other southeast ports and the extensive mountainous terrain that would have to be crossed would be insurmountable obstacles to this project and eliminated the southeast region from further consideration. Figure 1.9.3-1 provides a summary of the criteria evaluation for the statewide route options.

	Western Alaska		Southcentral		Southeast Alaska	
	Norton Sound	Bristol Bay	Cook Inlet	Prince William Sound	Yakutat Bay	Lynn Canal/ Chatham Strait
Continuous Operation of a Marine Terminal	●	⊗	○	○	⊘	○
Minimize Length of Pipeline	○	●	○	○	●	●
Maximize Use of Existing Utility/ Transportation Corridor	●	●	○	○	●	○
Maximize Use of Existing Infra-structure	●	●	○	○	⊗	○
Avoidance of Environmentally Sensitive Area	●	●	⊘	○	●	●
Avoid Permitting Delays	●	●	●	○	●	●

○ = Favorable
⊘ = Moderately Favorable
⊗ = Unfavorable
● = Highly Unfavorable

Figure 1.9.3-1 Summary of Criteria Evaluation for Statewide Route Options

1.9.4 Alternative Sites within Cook Inlet and Prince William Sound Region

Along with the applicant's proposed project and the Cook Inlet-Boulder Point alternative considered in this EIS, two additional Cook Inlet and three Prince William Sound alternative LNG plant/marine terminal sites were evaluated for project feasibility *by YPC and evaluated in this FEIS.* These include Gold Creek, Robe Lake, and Gravina in Prince William Sound, and Cape Starichkof and Harriet Point in the Cook Inlet region (Figures 1.9.4-1 and 1.9.4-2). Other sites previously considered by FPC for the El Paso proposal as having LNG plant site potential in the Gravina area were Hawkins Island and Bidarka Point. *Although* Gravina was used as a representative site for Prince William *Sound* sites outside of Port Valdez, *each of these three Prince William Sound sites had similar access problems as identified in subsection 1.9.4.3 and required difficult marine crossings.* Eleven pipeline criteria, ten LNG plant site criteria, and seven criteria related to the marine terminal were used to consider the degree of favorability for each of the alternative sites. Results of this analysis are presented in Appendix C and summarized in Figure 1.9.4-3. Evaluation of the applicant's proposed project and the Cook Inlet-Boulder Point alternative are presented for comparison with the other sites on Figure 1.9.4-1 and in Section 2. The other Prince *William* Sound and Cook Inlet sites were inferior to the proposed project and Boulder Point sites, respectively, and were eliminated from further consideration. The existing Phillips-Marathon LNG site and the adjacent Nikiski site previously evaluated for the Pacific Alaska LNG Associates Projects (FERC, 1978) cannot accommodate the scale of facilities necessary for TAGS.

1.9.4.1 Cape Starichkof

Cape Starichkof, which shares a common alignment with the Boulder Point site as far as Boulder Point, has one distinct disadvantage--the extra pipeline length and additional compressor station required to transport the gas 59 more miles would have many implications for construction time and associated increase in impacts to the environment and costs. The LNG site characteristics are similar to those for Boulder Point except that land availability would be more of an issue and the environment around Cape Starichkof is more sensitive with respect to fish and shellfish, the fisheries (as economic entity), and recreational use of the area. Marine terminal site characteristics are also similar to those for Boulder Point with the exception that navigational hazards, uncharted submerged boulders and outcrops, and potential sea-ice problems would be less of a factor at Cape Starichkof. The same permitting problems associated with Denali National Park and Preserve exist. Cape Starichkof was rated as less favorable than Boulder Point and eliminated from further consideration.

1.9.4.2 Harriet Point

The pipeline alignment to Harriet Point poses problems over the Boulder Point and Cape *Starichkof* alignments. Like Starichkof, Harriet Point would require a longer pipeline and an additional compressor station. Most of the route along the western shore of Cook Inlet is away from available infrastructure to support construction. Few data exist for environmental impact assessment and engineering design analyses. The route also passes through areas of sensitive environments for wildlife and fisheries. The LNG plant site has advantages of land availability and little potential impact to public safety from an accident or spill should one occur. One distinct disadvantage for the LNG plant site is the lack of any infrastructure. Facility construction and operation would be much more difficult and costly since there is no community or commercial base in the immediate vicinity to support the project. The potential for any secondary development would be curtailed. Along with the permitting issue associated with the crossing of Denali National Park and Preserve, Harriet Point would be rated as less favorable than Boulder Point and eliminated from further consideration.