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**BP Amoco:
Commercializing North Slope Gas**

BP Amoco



**House Oil & Gas Committee
Alaska Legislature
February 3, 2000**

**Ken Konrad
Business Unit Leader
Alaska Gas Business Unit**

Mr. Chairman, members of the committee, thank you for the opportunity to speak today about BP Amoco's efforts to commercialize our North Slope Gas resource.

For the record, my name is Ken Konrad. I am Business Unit Leader for BP Exploration's newly formed Alaska Gas BU.

Today, I'll be talking about the history of Alaskan gas development efforts, our current situation in Alaska, and the increasingly exciting opportunities we see for commercializing Alaskan gas.



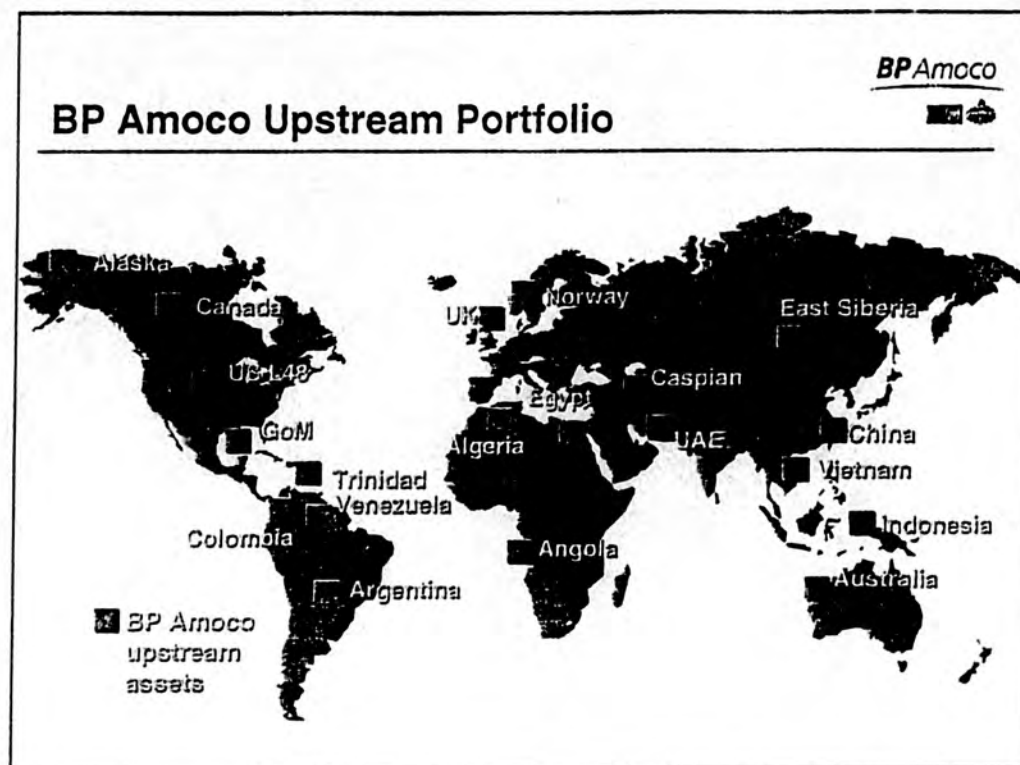
Discussion Outline

- Context
- BP Amoco Portfolio
- Alaskan Gas Commercialization
 - *GTL*
 - *LNG*
 - *Pipeline*
- Opportunities and Challenges
- Summary

I thought it would be helpful to set the stage by providing a bit of industry context. This will include a brief overview of our worldwide portfolio as well as a view of how we see general gas industry trends as a whole.

I will then focus on Alaska more specifically, and discuss the various efforts, both past and current, which we've sponsored to mature means of monetizing this gas resource. These efforts include Gas-to-Liquids technology, a number of different LNG schemes, and gas pipeline projects to the Lower 48 which are again gaining momentum.

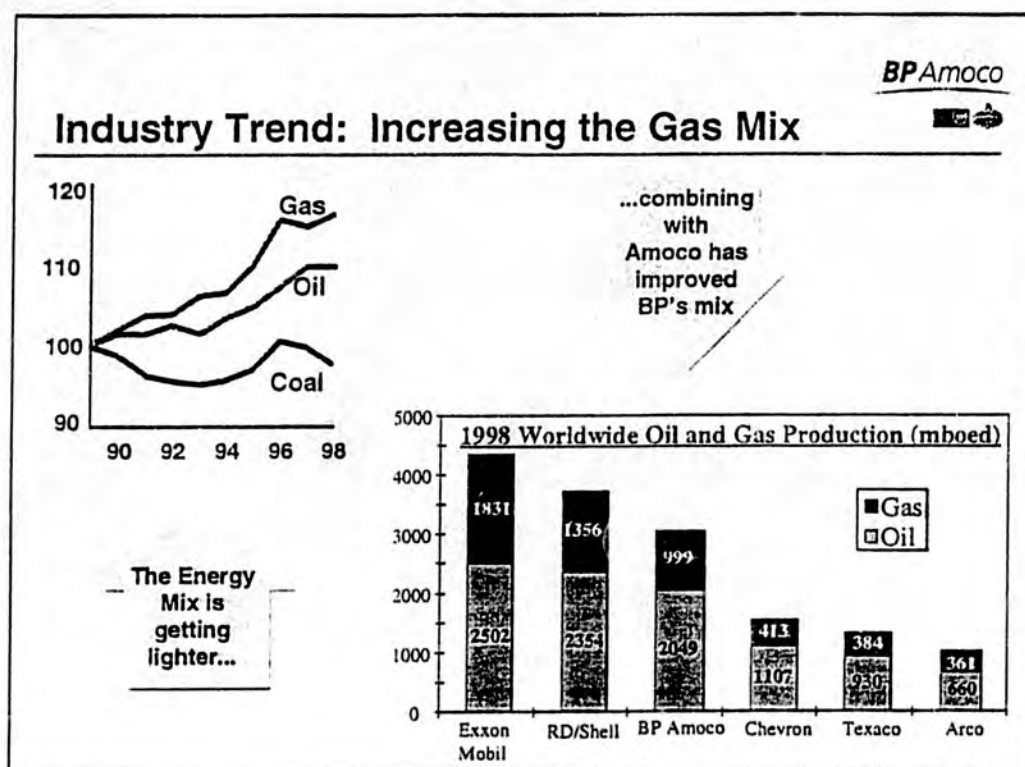
As you know, monetizing stranded gas is both an opportunity and a challenge. This is certainly true in Alaska, where the resource base is huge, but the remote location and high cost of delivering gas to market has thus far prevented us from finding a commercial solution.



As a result of the merger with Amoco, BP has become a company with significant world wide gas resources. This map gives a sense of our global reach.

As our CEO John Browne said to Analysts in July, BP is committed to grow it's gas business. This growth will be driven by a newly-formed gas & power division which is already of considerable size, with revenues exceeding \$5 billion annually.

We're not just looking for growth that occurs in small incremental steps. Indeed, we're looking for the large strides and transforming steps from areas like Alaska.



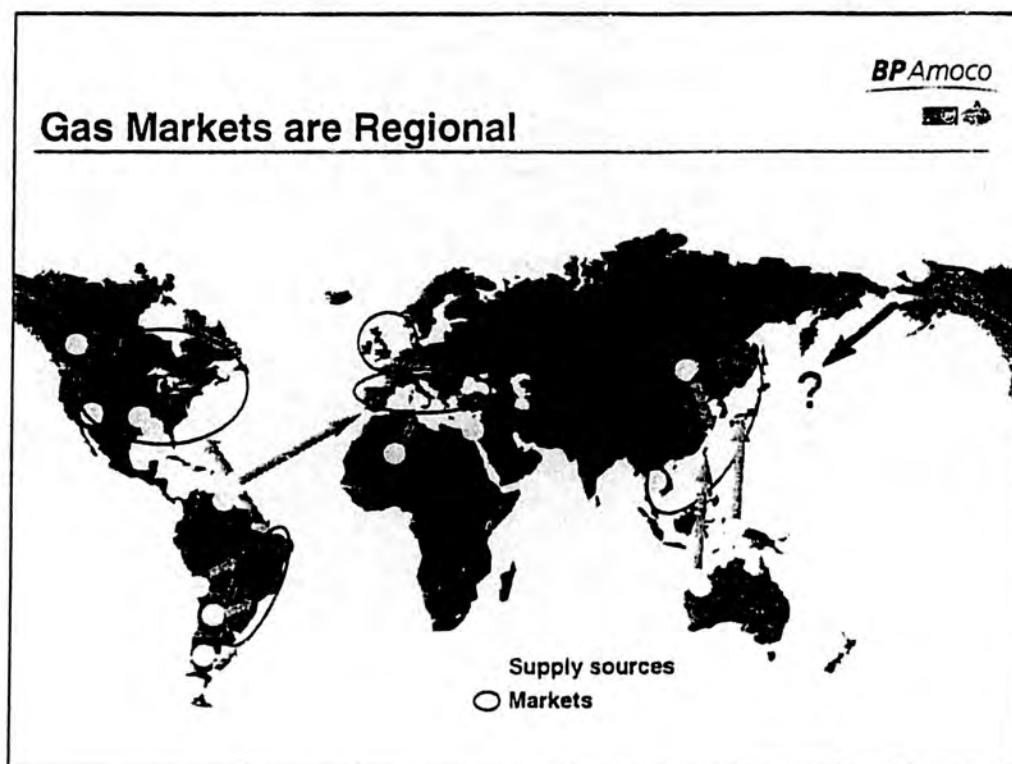
It is no coincidence that BP Amoco's decision to establish and grow a separate gas and power business stream coincides with dramatic changes in the market itself. In the upper left of this graphic you can see the overall trend of energy consumption over the past ten years.

While energy consumption overall is rising at about 2% per annum, the components of that demand are changing, with the overall energy mix getting lighter. In fact, it's worth considering that the global gas and power economy, at \$1.3 trillion per annum, is nearly twice the size of the global oil economy. And projections indicate that gas demand could double by 2010. Clearly, gas is emerging as the preferred hydrocarbon source, for a number of reasons, including the environment and combined cycle turbine technology.

BP historically could be characterized as an upstream oil-centered company. While we intend to maintain an upstream bias, the focus on oil is changing. Because gas is emerging as the hydrocarbon of choice, BP recognized the need to change our own resource base to capitalize on this trend. Gas is rapidly catching up with oil in terms of our business priorities, and this is very evident in the shape of the new BP Amoco.

As you can see in the lower right portion of the graphic, gas now accounts for a significant percentage of our worldwide production — a percentage we plan to grow.

The growth of gas in the BP Amoco portfolio is one important element in our overall growth strategy. As you'll see shortly, Alaska also figures prominently in this future gas growth agenda.



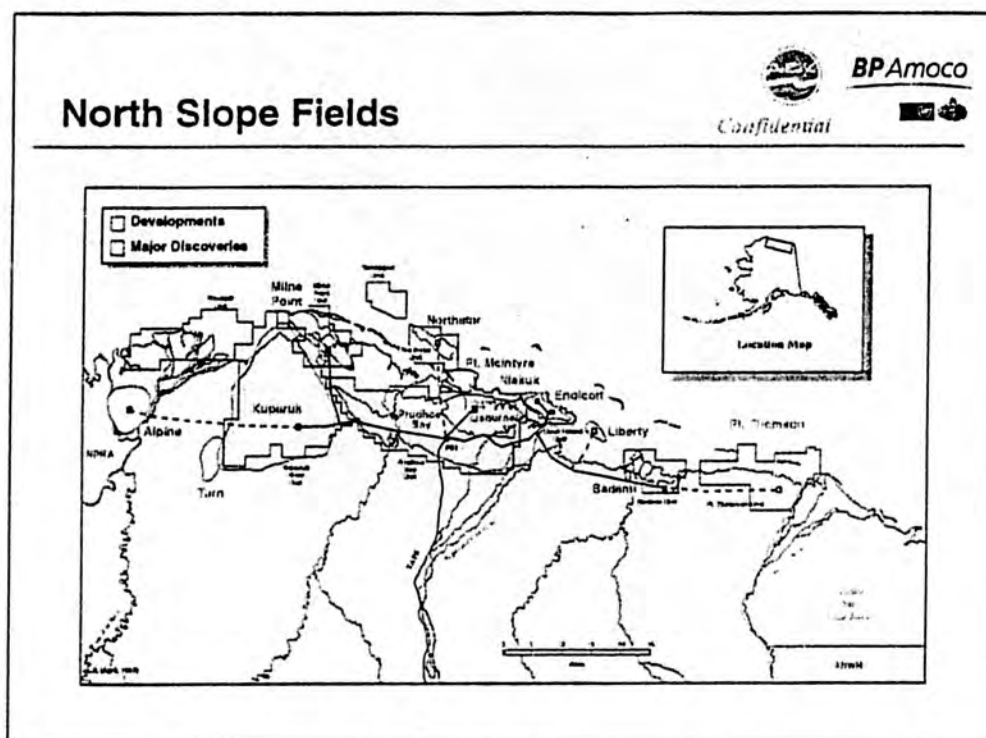
Most of BP Amoco's gas resources are ideally located in terms of the world's major gas markets, including North America and Europe, as well as emerging markets in South East Asia, the Mediterranean and Latin America.

One notable exception of course, is Alaska.

At over 30+ tcf, the Alaska gas resource base is clearly world class, but the remote location has thus far prevented a major commercialization of this gas resource. We are working to change this.

To that end, we have established a new Business Unit with the sole priority of investigating all options to commercialize Alaska Gas. The options include export of LNG to the Far East, gas pipeline options exporting gas to the North American market, and conversion to liquids and transport down TAPS, taking advantage of the existing infrastructure.

It is also important to note that these are not mutually exclusive options. There is sufficient gas resource available to support multiple commercial projects.



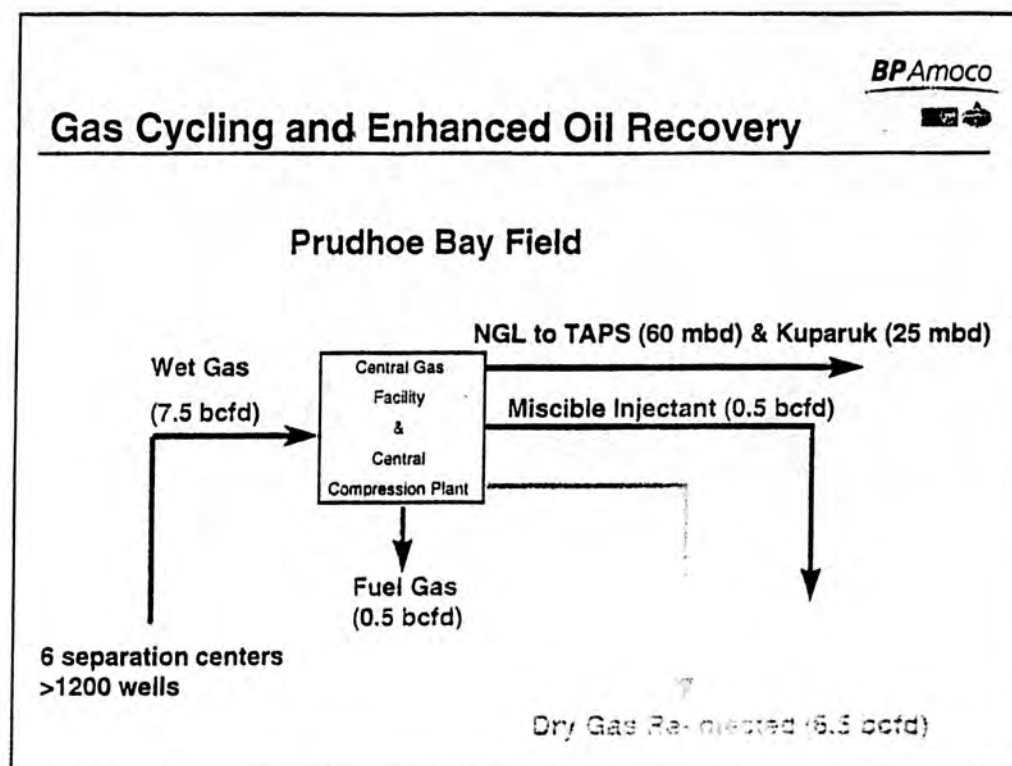
Now let's focus down to the Alaskan North Slope. Here you see a map showing the producing fields and significant discoveries of the North Slope. Of course the biggest of these discoveries is the Prudhoe Bay field. Last year we celebrated a major milestone at Prudhoe, having produced our 10 billionth barrel of oil. Current estimates suggest that 4 billion barrels of oil remain to be produced.

Prudhoe also contains a huge gas resource, with some 26 tcf of gas available. In fact, the gas processing facilities at Prudhoe are the largest of their kind in the world, processing over 8 bcf a day. Historically, with no proximal major gas market, this gas has been re-injected to maximize oil production.

While Prudhoe is certainly the biggest game in town on the Slope, it's not the only gas resource on the North Slope. Exxon discovered the Pt. Thomson gas condensate field in 1975, which contains an estimated 6+ tcf of gas resources. The Pt. Thomson owners (chiefly ExxonMobil, BP Amoco, Chevron, and Phillips) continue to work together in an attempt to find a commercial solution to develop this more remote, and challenging field.

Gas Cycling and Enhanced Oil Recovery

BP Amoco



It's important to recognize that up until gas is exported from Prudhoe, it continues to play a key role in improving oil recovery. This improved recovery is achieved with the help of the world's largest gas processing facility.

The overall process is summarized in this very simple schematic which shows Reservoir Gas being produced to our Central Gas Facility where NGLs are extracted for blending with crude transported down TAPS. Current NGL production rates run at about 60 mbd to TAPS, with the sale of another 25 mbd to the neighboring Kuparuk oil field for use in its miscible gas enhanced oil recovery project.

Miscible Injectant is also manufactured at the CGF, for use in enhancing oil recovery from the waterflood areas within Prudhoe Bay.

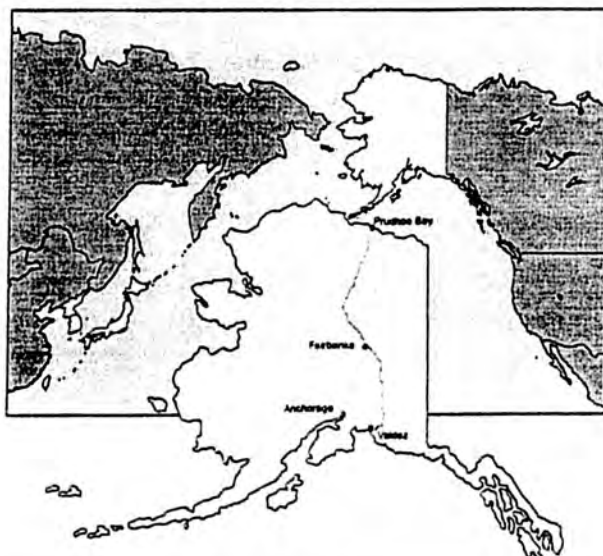
The remaining dry gas is compressed and re-injected into the Prudhoe gas cap. This re-injection process enhances oil recovery through both pressure maintenance and vaporization of residual oil which is then cycled back and re-produced as wet reservoir gas.

To date, this use of gas has enabled the recovery of billions of barrels of additional oil. However, as the field ages, the benefits of gas cycling are diminishing.

The gas resource at Prudhoe continues to be used to improve oil recovery and will be until we are able to export gas from the Slope by whatever means.

Alaska Gas History

BP Amoco



Efforts to achieve a major North Slope gas sale date back to the 1970's. These include a number of different LNG studies, the first of which were initiated as early as the late 1970's, and which we've since conducted jointly with our partners Exxon and ARCO, among others. Our first Alaskan GTL studies were conducted in 1980, and have continued on through to today. Also, since first oil from Prudhoe, a number of pipeline options have also been advanced, but to date no commercial option has emerged for monetizing Alaskan gas. All of these options are still in play, and they are in play because a recent convergence of events has resulted in a new opportunity to commercialize Alaskan Gas.

One such event is a technology push which has lowered overall project costs or improved the processes required to produce LNG or liquid fuels from methane. New technologies are also increasing demand for natural gas – technology like combined cycle turbines that which make natural gas the preferred fuel for generation of electric power in many places.

A second event is market pull. The world over, people are demanding economic growth and cleaner air.

Finally, governments around the world are working with industry to support gas developments in unprecedented ways. A good example is the "stranded gas bill" passed in Alaska which provides for modification of fiscal terms in order to make North Slope gas sales more competitive.

Alaska Gas Today

BP Amoco



- **26 TCF Prudhoe Bay Gas Resource**
- **Refocused Efforts on Gas Commercialization**
- **Alternatives**
 - Reinjection for pressure maintenance & enhanced oil recovery
 - GTL
 - LNG
 - Pipelines to lower 48
- **Alaska Government Co-operation**
- **Future Plans**

So where are we today in the effort to move Alaskan gas to market?

We certainly have a huge resource position with 26 tcf of known Prudhoe Bay gas, and existing infrastructure including gas production and separation facilities, as well as pipeline and terminal facilities.

Alaska offers a politically stable environment, with co-operative State and local governments eager to achieve a major gas sale.

We also have strong project sponsors among the major gas producers in ARCO, Exxon and Phillips most notably, as well as non-producing pipeline companies and other sponsors and promoters who are actively working various gas commercialization schemes.

However, even with these advantages, significant challenges remain. These include the obvious challenge of distance from market, with a resulting dependence on technology to provide a breakthrough in costs. That's why we are working multiple commercialization options, including gas-to-liquids, LNG export and various pipeline export schemes.

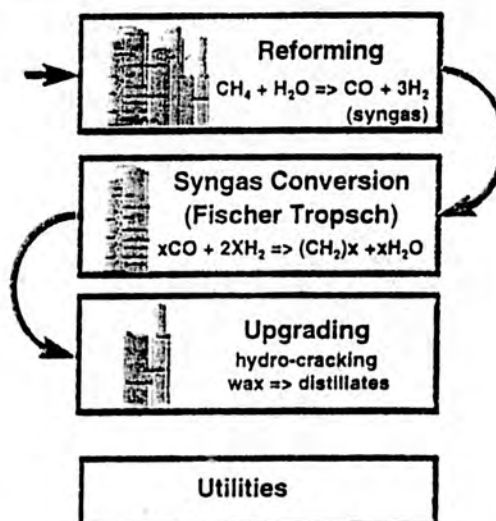
Recognizing the importance of technical breakthroughs, BP Amoco will locate its global gas technology center in Anchorage after approval of the ARCO combination. We believe that proximity to the resource will keep our best minds focused on the technical challenges in Alaska.

GTL: Technology Creating New Business Opportunities

BP Amoco



- Efficient production of syngas
- Focus on reducing cost to market
- Alaskan pilot test facility
- Liquid product shipped to TAPS



The North Slope represents a unique opportunity to use syngas technology.

BP is continuing engineering for a \$70 million pilot facility in Alaska to test its current technology. We are not alone in pursuing this option.

ARCO has an operating GTL pilot facility at the Cherry Point, Washington refinery. Completion of the merger will allow the companies to share the best technologies to chase after this huge prize at Prudhoe Bay. Exxon has also devoted significant effort to the search for a cost competitive GTL technology.

GTL technology in Alaska is on the edge of being commercially viable today, and technical breakthroughs and process improvements have the potential to make it more competitive, which is why we've committed to testing our GTL technology on a larger scale.

Ultimately we could see a GTL project being pursued in conjunction with either an LNG or a gas pipeline project - as noted earlier, the Alaska gas resource is large enough to accommodate multiple projects.

Alaskan LNG

BP Amoco



- **Consortium maturing an Alaskan LNG project**
 - ARCO, BP, Phillips, Foothills, Marubeni
- **Premise based on export to Far East**
 - project sized to market demand
- **Range of cost at \$5-6 billion, excluding ships**
 - North Slope gas treatment plant, 800 mile pipeline, LNG plant at tidewater
- **Market liaison office opened in Japan**
- **Start-up as early as 2007-2010 timeframe**

There are two groups currently pursuing LNG projects in Alaska. One group is examining the feasibility of a 15-20 million ton per year project that would export LNG from Valdez. The mayors of Fairbanks, Valdez and the North Slope Borough have come forward with a plan that could deliver a low cost, tax-free financing option for this or another gas sale alternative. We congratulate them on what sounds like a favorable ruling from the IRS.

BP Amoco is part of an industry consortium that also includes ARCO, Phillips Petroleum, Foothills Pipeline Co., and Marubeni Co. that is assessing the feasibility of exporting up to 7 million tons annually to the Far East from Valdez or the Cook Inlet.

It is not difficult to foresee a future in which these parallel efforts could come together. BP Amoco will work within the consortium and with the pipeline mayors to advance a project.

We believe developing a competitive 7 million ton per year project is very possible. Our research indicates that a smaller project is more likely to gain market acceptance and that project competitiveness is enhanced by shortening the time required to move from startup to full capacity. 7 million tons a year is still a very large project. It would provide a solid foothold in the market, and allow us to increase the volume of gas exported as demand for gas grows.

BP Amoco, in partnership with Atlantic LNG, built and operates in Trinidad the lowest cost LNG project in the world, and we are working to transfer that knowledge and technology to this Alaska opportunity. While a 7 million ton, single train facility seems a bit out of step with the industry norm of trains about half that size, Alaska appears to offer the opportunity to increase plant scale at reasonable cost. This is because lower ambient temperatures significantly improve compression efficiency, enabling a larger single train design. This design is still a work in progress, but it's an effort we're committed to maturing.

There is no window for LNG sales to the Far East. We see demand for LNG growing steadily around the Pacific Rim as the economies of the region continue to develop and as environmental concern and improved power turbine efficiency leads to increased reliance on natural gas for electrical generation.

The market will decide which LNG projects succeed, and when. There is a lot of competition. But recognizing these facts, the gas sponsor group has elected to open a market liaison office in the Far East.

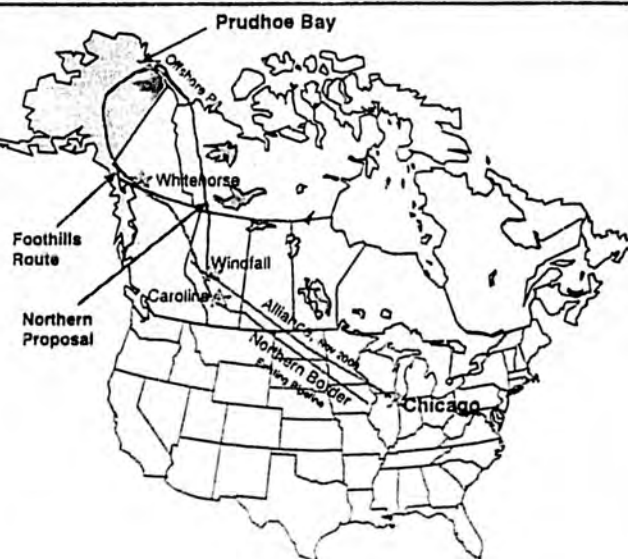
Ultimately, a successful, economically competitive LNG project will require major breakthroughs in several key areas including cost, marketing and fiscal regimes.

Gas Pipeline to Lower - 48

BP Amoco



- Several studies conducted since PBU start-up
- Current 3rd party cost estimates as low as \$6 bn
- Two major routes studied



There have been several gas pipeline studies conducted since Prudhoe Bay start-up. Two major routes have been investigated, the Southern route following the Alaska Highway through Fairbanks and on to Canada. This route is generally referred to as the "ANGTS" line. The Northern route follows the Alaskan coastline to the McKenzie Delta and then south through Canada.

BP Amoco has been approached by multiple parties promoting one or more gas pipeline options to deliver Alaskan gas to the Lower 48 states -- the largest gas market in the world. Each has its own inherent advantages and drawbacks. The Northern route is generally considered to be less expensive, with costs around \$6 billion. But the more mountainous Southern route may have existing permits, and shares potential synergies with an LNG export option.

In general, these proposals could include export of up to 4 bcfd, and are sized to handle Canadian gas as well. But much work is required to verify estimates and otherwise mature these projects to the point of determining commercial viability. We're certainly not there yet, but there is a growing momentum around these options. Resolving the technical questions could create a truly exciting opportunity for Alaska.



Summary - Alaska and Beyond

- **BP Amoco committed to growing gas business**
 - New business stream to focus on gas growth
- **Alaska committed to maturing range of options**
 - Government co-operation
 - BP creating world-wide Gas Center of Excellence in Anchorage
 - Continuation of LNG Sponsor Group
 - GTL pilot test facility in Alaska
 - Pipeline options to Lower 48
- **Today's "Stranded Gas" represents tomorrow's growth**

In closing, I'd like to reiterate some key themes relative to BP Amoco and Alaskan stranded gas.

First, BP Amoco is committed to growing its gas business. This is evidenced by recent actions, and is driven by the increasing importance of natural gas in the world's energy market. Gas is becoming the preferred hydrocarbon.

Second, in Alaska we are working to mature a range of gas commercialization options. All of the options are worth pursuing and pursuing them all at once is part of our strategy for achieving a major gas sale sooner, rather than later. Besides, the gas resource is large enough to accommodate multiple commercially viable projects.

Finally, we are driven by a clear understanding of what is possible. In Alaska, we're searching for the gas sale opportunities made possible through advancement of technology, the drive of the marketplace, and the co-operation among stakeholders.

Competition in the gas business is driving innovation as various industry players seek to differentiate themselves. As has been the case in the past, this trend will continue, and will allow those companies with the resources, determination and ingenuity to create new opportunities like those BP Amoco are pursuing in Alaska.

Thank you. I'd be happy to try and answer any questions you might have.

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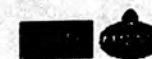
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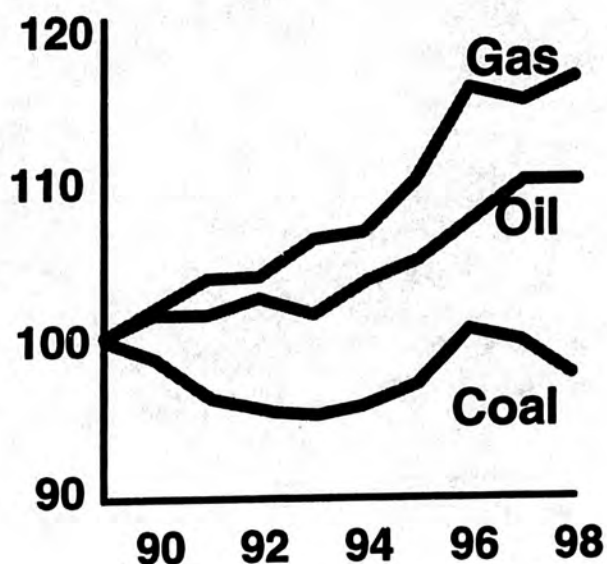


BP Amoco Upstream Portfolio



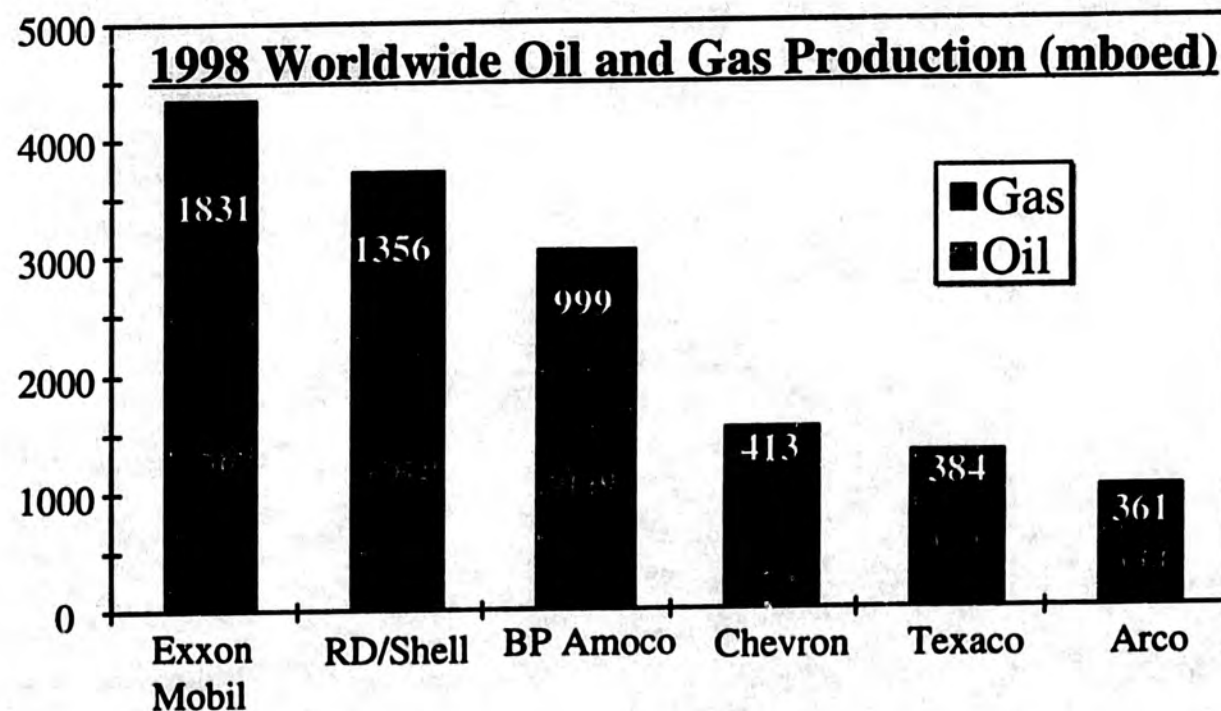


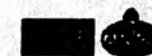
Industry Trend: Increasing the Gas Mix



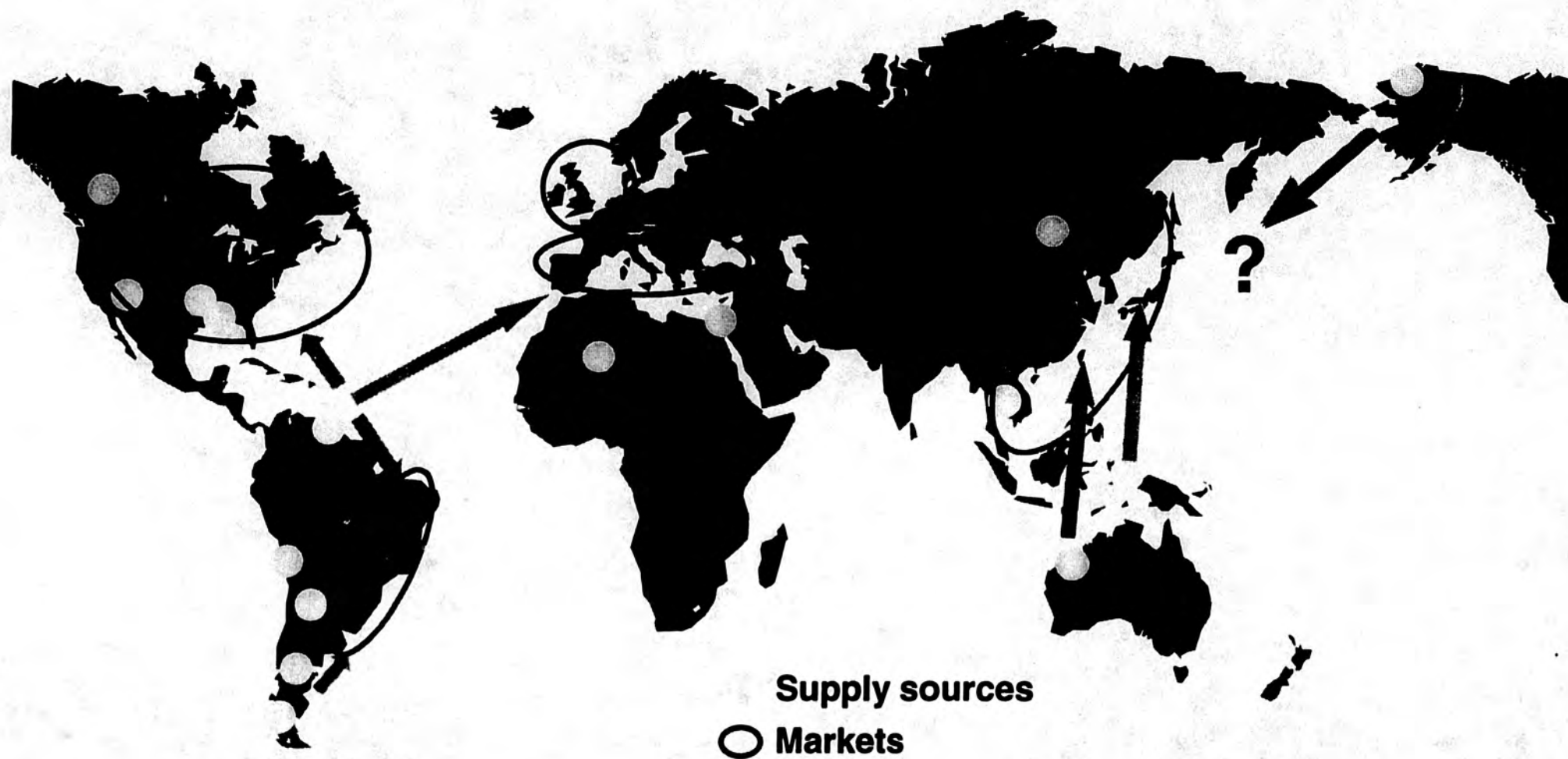
...combining
with
Amoco has
improved
BP's mix

The Energy
Mix is
getting
lighter...



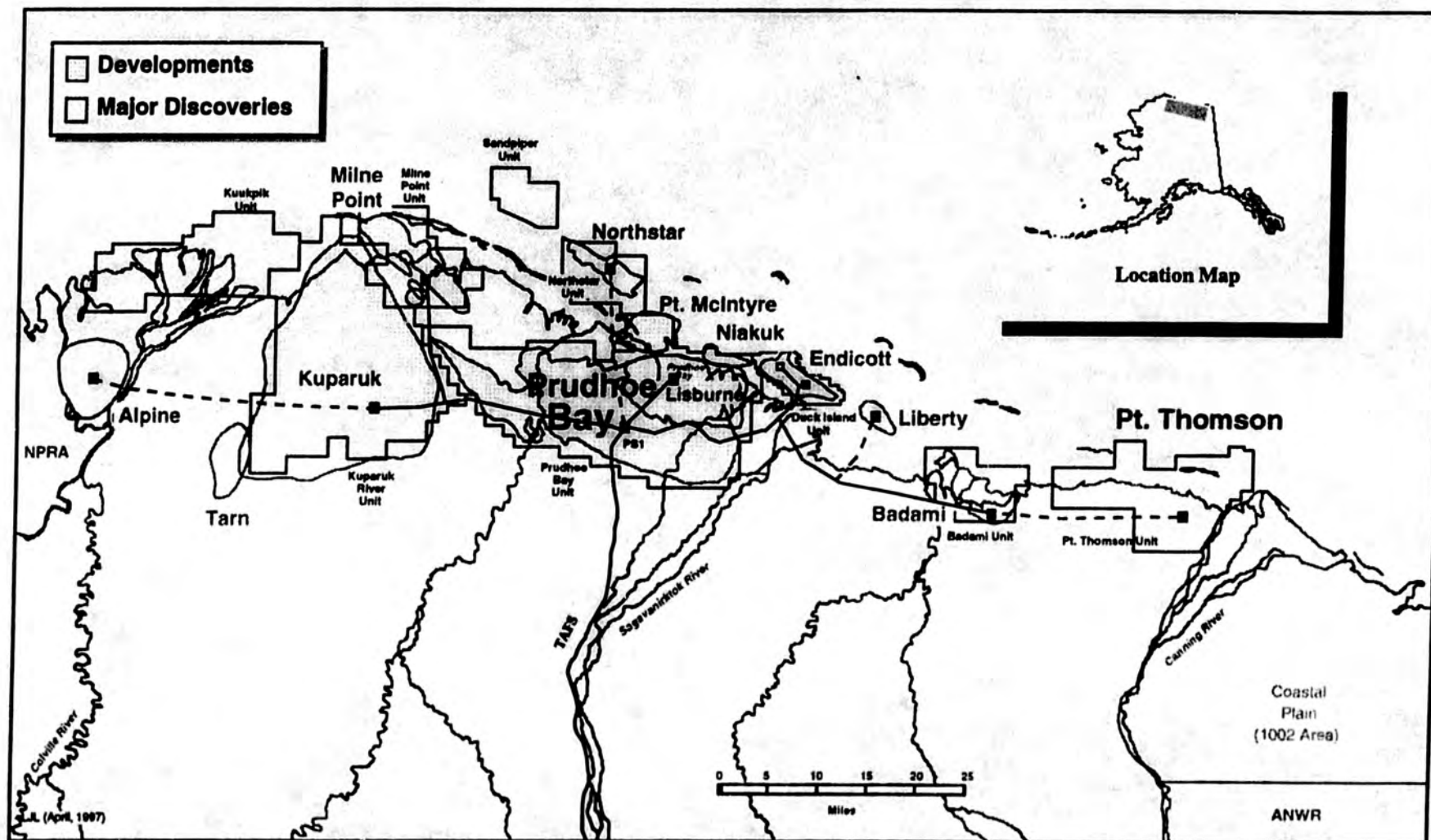


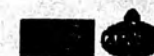
Gas Markets are Regional





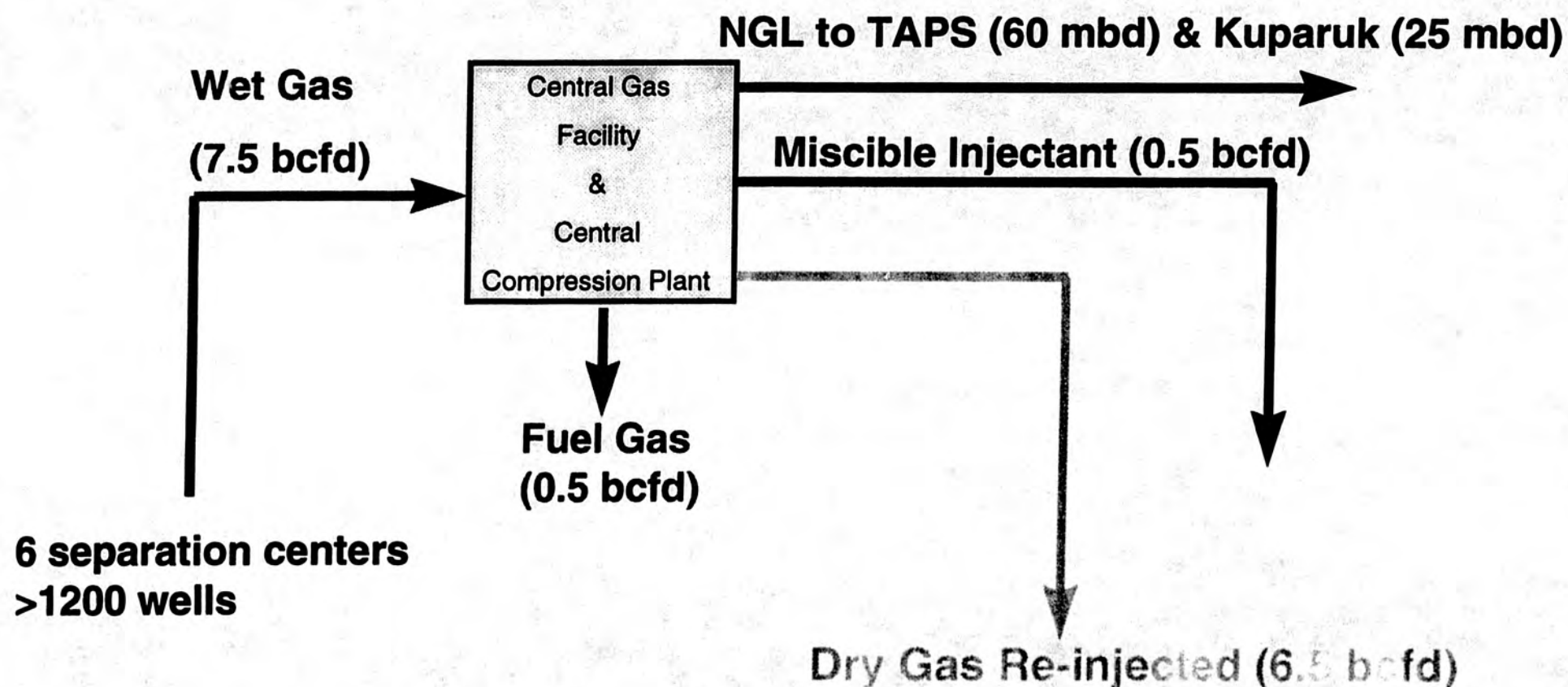
North Slope Fields

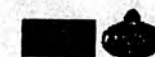




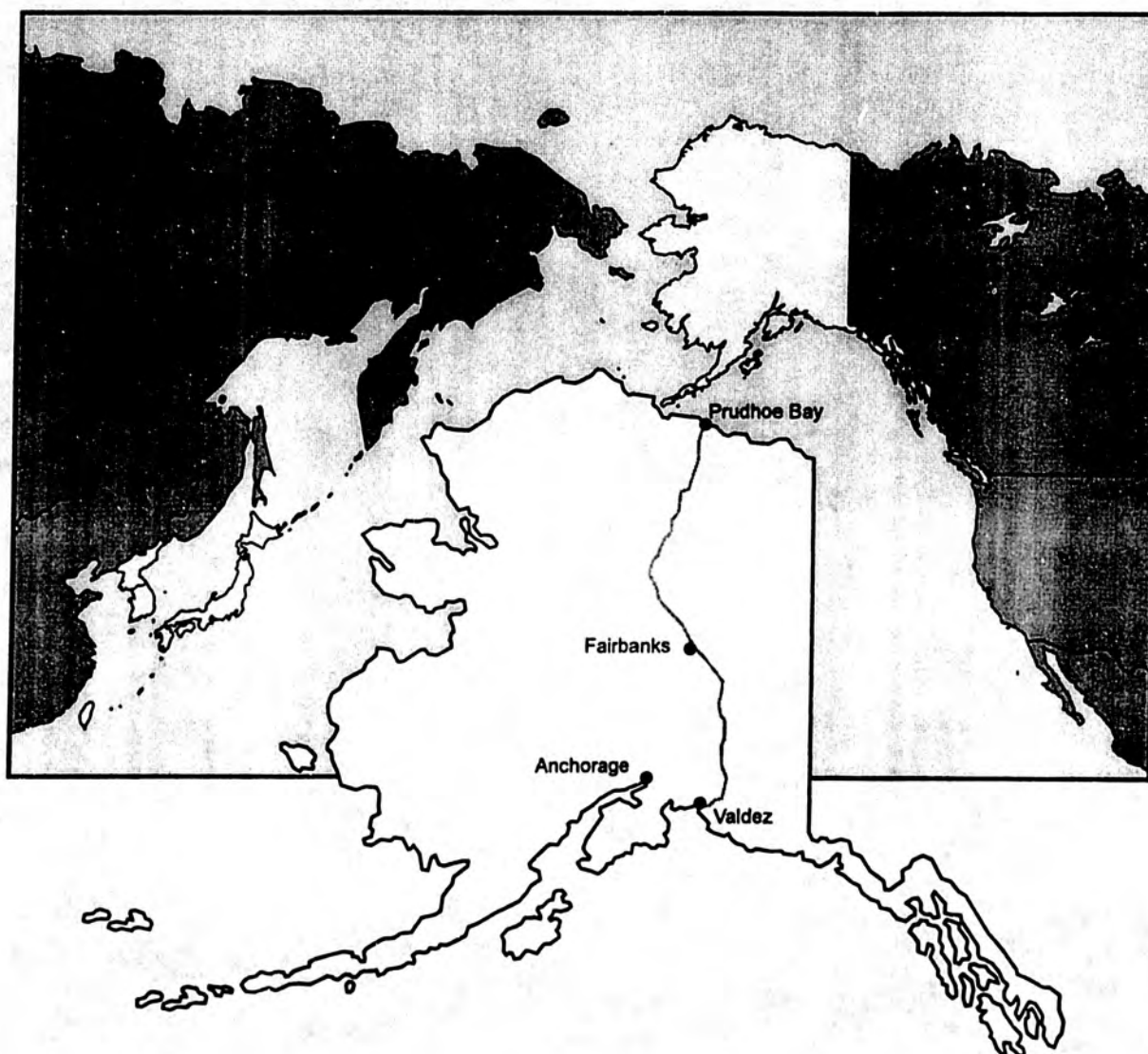
Gas Cycling and Enhanced Oil Recovery

Prudhoe Bay Field





Alaska Gas History



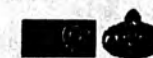


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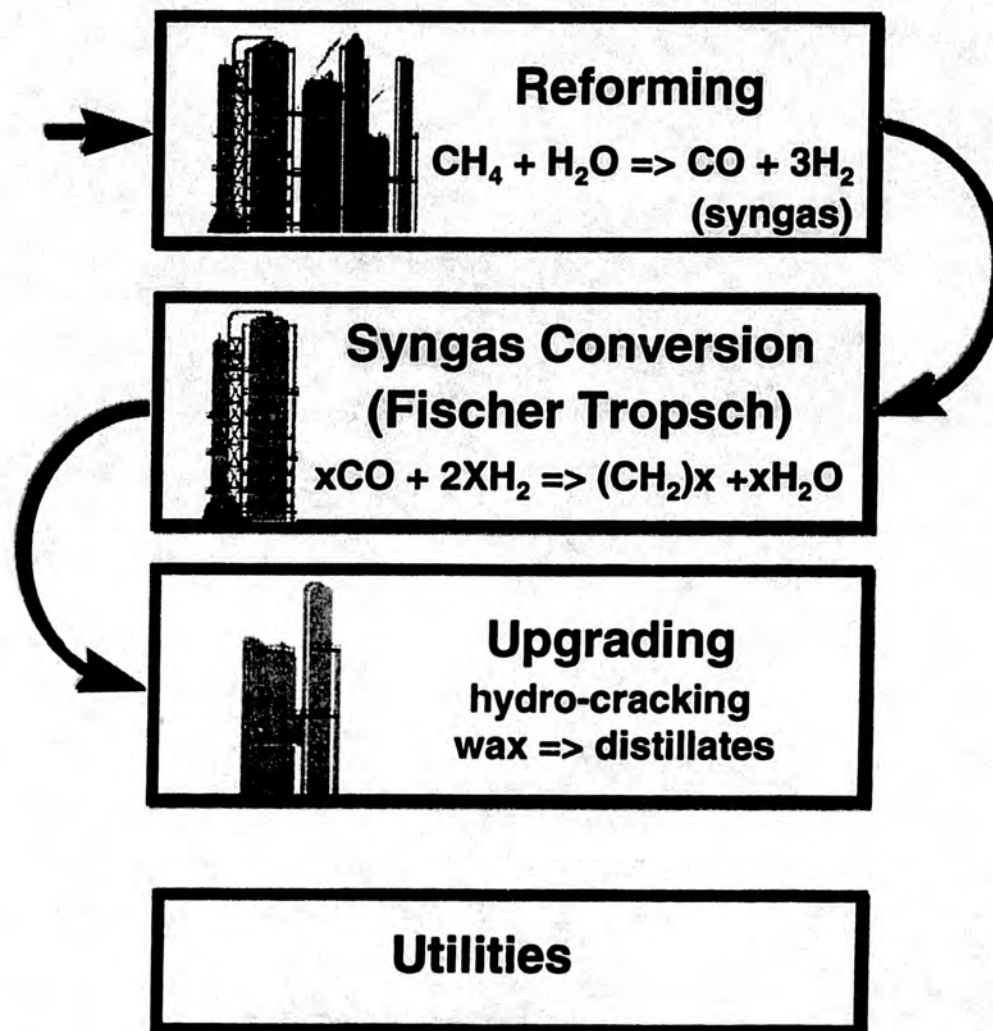
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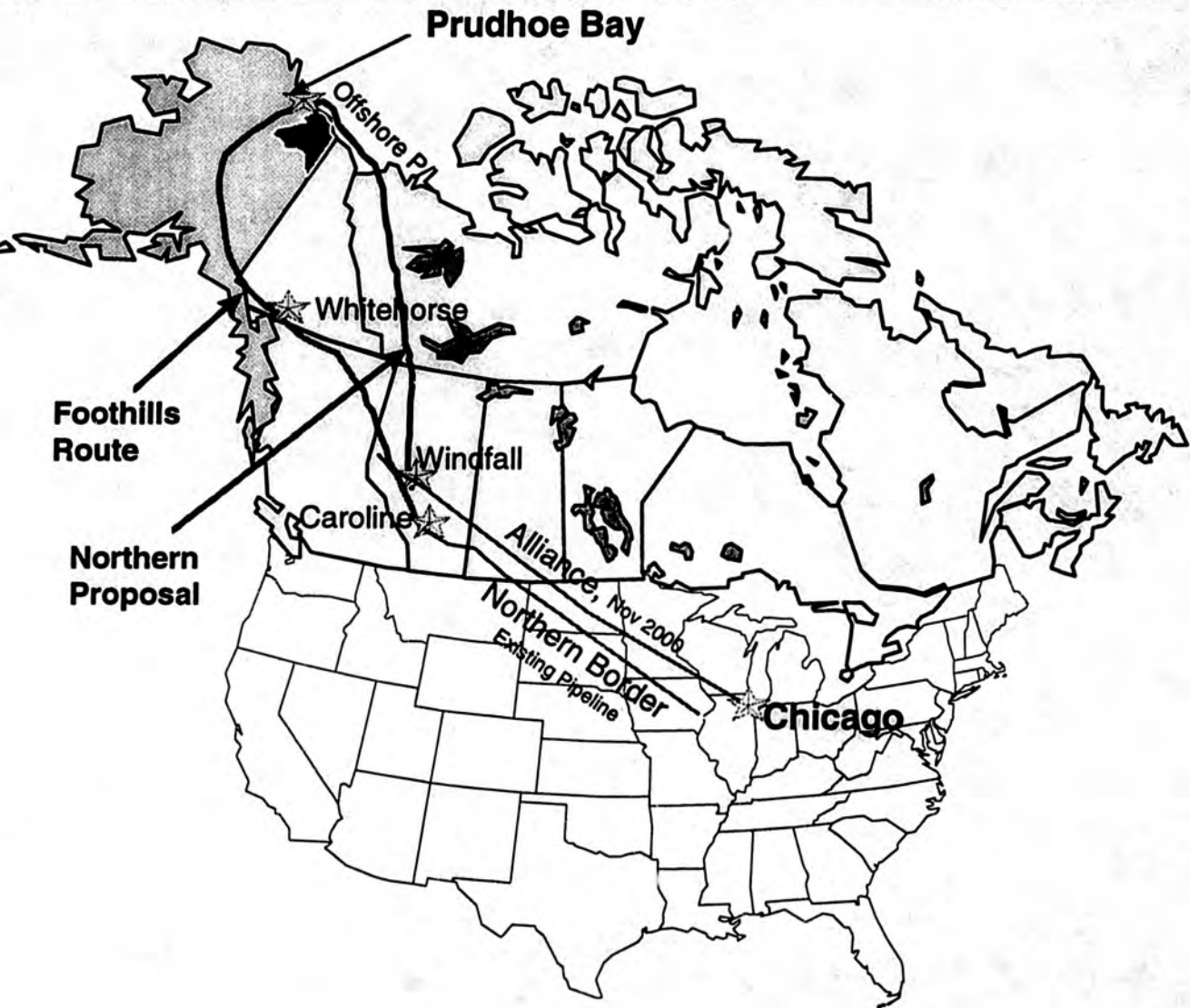
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