FINANCING AN ARCTIC GAS DELIVERY SYSTEM

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Introduction

I first became acquainted with Arctic gas in 1974 as an analyst in Exxon's Treasurer's Department. At that time, there were two competing transportation proposals. One was an over-the-top pipeline to ship Alaska and Canadian gas south to Alberta, where it would tie into various east-west pipelines that were yet to be built. The other proposal was an "Alaska Only" pipeline from Prudhoe Bay to the Cook Inlet, where the gas would be converted to LNG and shipped by tanker to California.

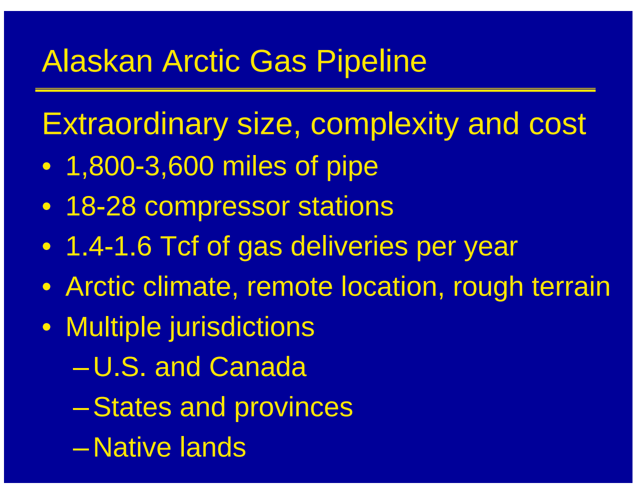
The Federal Power Commission held hearings to evaluate both projects. These hearings precipitated critical debate about financing and it was eventually determined that neither project was financeable without government financial support.

A lot has happened in the 30 years since 1974 to make Arctic gas more economical: gas prices are higher and unit shipping costs are lower as a result of larger reserves and higher pipeline pressures. Recent legislation to provide federal debt guarantees and tax incentives has affected the economics as well. The question today is whether or not these improvements are sufficient to make an Arctic gas delivery system financeable. In addressing this question, I would like to frame the discussion around two fundamental investment parameters, risk and return.

Risk vs. Return

To put it simply, no rational investor will voluntarily commit important sums of capital to finance a project, unless the expected return on that project is commensurate with returns available on alternative investments of comparable risk.

Arctic pipeline investors face enormous risks, so traditional regulated rate base returns will not attract the required financing. Gas producers need to invest capital in gas treatment and NGL recovery facilities. Returns on these upstream investments logically should exceed pipeline returns because producers won't earn a penny unless the pipeline is operational and gas prices exceed the cost of transportation.



An Arctic gas pipeline would be an unprecedented private sector undertaking. Proposals differ in terms of route, size, pressure and throughput, but whatever proposal is built will be huge and complex.

I would like to bring the trade-off between risk and return into sharper focus with some financial projections derived from the assumptions shown in the next slide.

Illustrative Pipeline Assumptions

- 40 Tcf gas reserves @ 4.0 Bcfd
- $15 billion capital costs
- $0.29/Mcf operating costs
- 2.0% Inflation
- Gas price: $4.00/Mcf (real)
- 10% allowed rate base return
  - 60% Debt @ 8-1/3%
  - 40% Equity @ 12.5%

Assume there are 40 Tcf of producible gas reserves and throughput averages 4.0 Bcf per day. Capital costs are $15 billion over three years of construction. This estimate does not include gas treatment and NGL processing facilities, which Alaskan producers have estimated would cost another $3 billion. Operating costs are $0.29 per Mcf and escalate 2.0% per year, except for the fuel component, which grows faster, as wellhead netbacks increase. Natural gas prices are assumed to average $4.00 per Mcf in constant dollars. The financing assumptions are similar to those used by FERC to establish conventional pipeline returns.

The resulting economics are shown in the next slide.

Generic Pipeline Economics

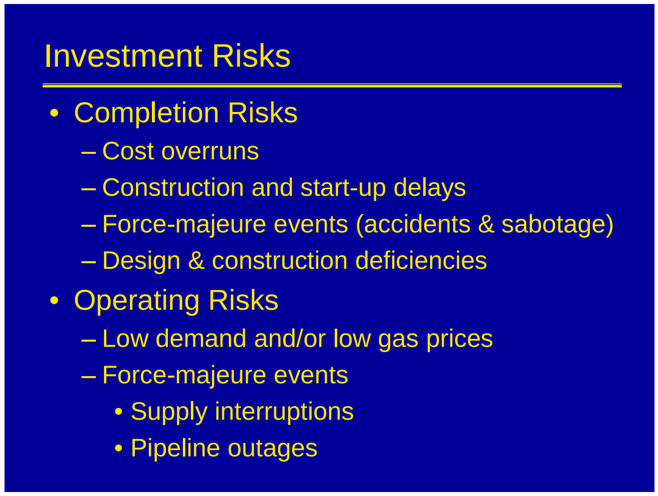
Cumulative Cash Flows	Nominal $ Billions	DCF Return
Revenues (Cost of Service)	64.2	
Capital Costs	(15.0)	
Operating Costs	(17.4)	
Pre-tax Earnings	31.8	14.5%
Property & Other Taxes (3.5%)	(9.2)	
Income Taxes (41.1%)	(5.4)	
After-tax Earnings	17.1	10.0%

Projected cost of service revenues over twenty years are $64.2 billion. Pre-tax earnings (cash flows) are $31.8 billion after deducting capital and operating costs. Almost half of this $31.8 billion goes to governments, assuming the tax rates shown, leaving $17.1 billion for pipeline investors. The discounted cash flow return to investors is 10% after-tax, consistent with the assumed rate base return. The projected tariff declines from $2.80 per Mcf in the first year of pipeline operation to $1.50 in year 20 and the “levelized” tariff is $2.26.

Of course, these results are only as good as the assumptions underlying them. A $10 billion increase in capital costs (from $15 billion to $25 billion) would increase the levelized tariff from $2.26 to $3.87. The tariff is also highly sensitive to financing costs, which I believe will far exceed

10% because this pipeline is bigger, costlier and riskier than any other natural gas pipeline in North America.

The risks confronting pipeline investors are presented in the next slide.

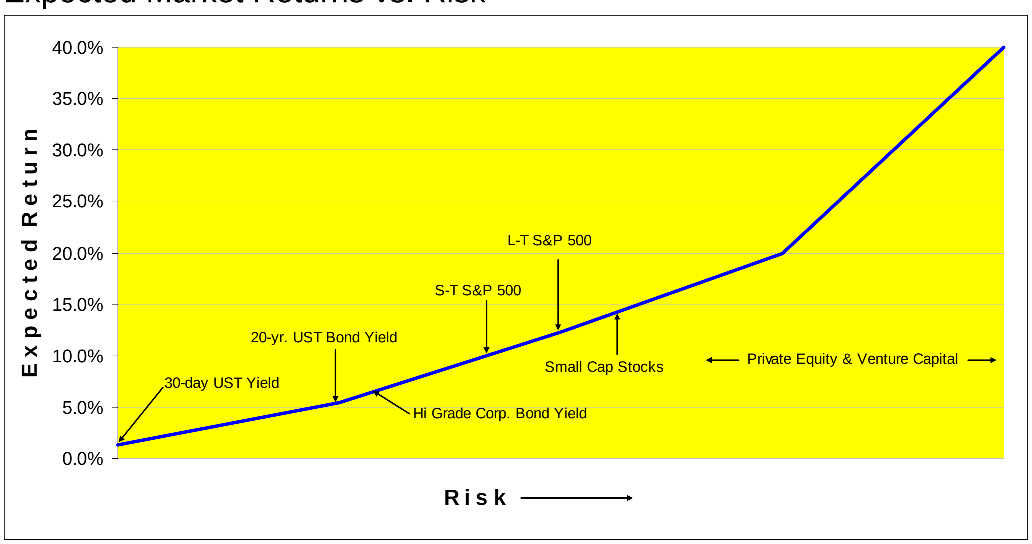


Many of these risks are front-end loaded and disappear once the pipeline is completed and viability has been established in technical, commercial and financial terms.

It is important to understand these risks from the perspective of financial markets because they are the ultimate source of capital. If sponsors *under*-price risk, the markets will punish them by bidding down the price of their securities until their cost of capital rises sufficiently to offset their mistake. The practical consequences of under-pricing risk probably wouldn't be detectable if this project were small. However, this is a very big project and a highly visible one too. Progress will be monitored closely and mistakes that come to light are likely to be widely publicized.

The following graph shows how U.S. financial markets price risk.

Expected Market Returns vs. Risk



Expected returns are measured along the vertical axis and risk is measured on the horizontal. This relationship is normally depicted as an upward sloping exponential function, under the assumption that investors require increasingly higher returns for each additional unit of risk they undertake. This graph would look that way too if the scale of the horizontal axis were shrunk, but I left it this way to identify key points on the curve.

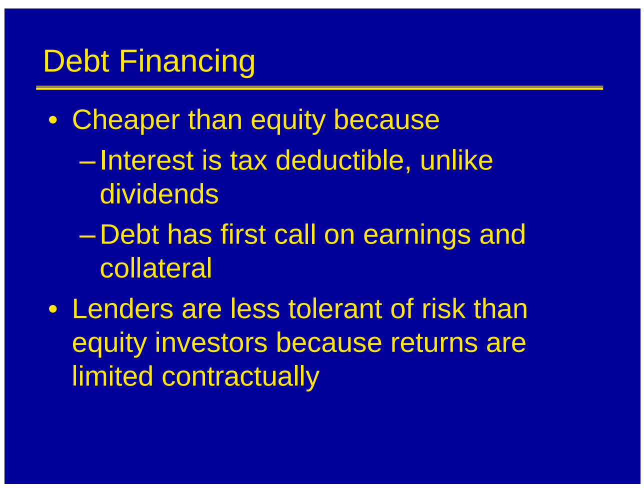
Expected returns intersect the vertical axis above the origin at around 1.5% to depict the yield on the least risky financial asset available, 30-day U.S treasury bills. The yield on 20-year treasuries is higher, about 5.4%, to compensate investors for the risk associated with longer maturities. The higher yield on high quality corporate bonds incorporates default risk. Default risk is nil for treasuries because the government can avoid default by printing more money.

The next point on the curve is the short-term return investors expect to earn by holding a broadly diversified portfolio of U.S stocks, about 10%. To the right of that point is the long-term expected return on the same equity portfolio (about 12%). Small capitalization stocks tend to have higher expected returns than the large cap stocks comprising the S&P 500 Index, so it stands to reason they are also riskier.

Once expected returns exceed the range of 15 to 18%, we leave the public financial markets in which financial assets can be traded easily on organized exchanges. Without this so-called "liquidity", investors bear the additional risk of having to continue holding assets they would rather sell. This is the world of private equity and venture capital, where many new projects are funded before they become operational.

Further along the risk continuum, a point eventually is reached where no return is high enough to attract capital. I don't know what the cut-off is for an Arctic gas pipeline, but I doubt it is much more than 20%.

There seems to be the perception that debt is somehow "better" than equity because it is cheaper and results in lower tariffs. The problem with this thinking is that it ignores the essential role of equity in financing risk.



Debt is cheaper than equity because interest payments are tax deductible, whereas dividends are not. Debt also is less risky because it has first call on the borrower's earnings stream and collateral, whereas equity receives only the leftovers remaining after lenders have been paid. In exchange for these preferential rights over equity, debt holders give-up the right to earn higher returns than they were promised when the loan was made. This lack of so-called "upside potential" is what causes lenders to be less tolerant of risk than equity investors in the first place.

Debt Financing (continued)

- Access to debt depends on
  - Borrower's ability to service debt from earnings (debt service coverage)
  - Value of assets that secure debt (collateral coverage)
- No Arctic gas pipeline will satisfy these conditions on a stand alone basis before completion

Because of this aversion to risk, lenders require that borrowers have an established stream of earnings from which to pay interest and principal. For additional protection against default, borrowers are also required to hold sufficient assets to ensure debt repayment in the event that future earnings are not sufficient.

The value of an incomplete or unprofitable pipeline is small in comparison to its cost of construction and that is why pipelines in general and this one in particular cannot borrow on a standalone basis until they have earnings. The term "standalone basis" means without recourse to outside support should the project default on its obligations.

Summing Up

- Government support is essential to financing an Arctic gas delivery system
  - The investment risks are enormous
  - Traditional pipeline returns are too low
  - Debt financing before "completion" requires unconditional guarantees from creditworthy parties

In summary, an Arctic gas pipeline is not financeable without outside support because the expected returns are too low compared to the risks involved.

Some have argued that producers have the most to gain from an Arctic gas pipeline, so it is reasonable for them to shoulder most of the investment risk. In their May 2002 pipeline update presentation to Alaska, producers stated the project was "not commercially viable" because "the risks outweigh the rewards." I interpret this to mean that the combined economics of production and transportation are not sufficient to attract the capital needed. My own projections support this assessment.

The next slide summarizes the combined production and transportation economics using the assumptions summarized in the first slide, plus a few more that I will introduce here.

Integrated Pipeline & Production Economics

	Nominal $ Billions	DCF Return
Revenues	200	
Capital Costs	(18)	
Operating Costs	(48)	
Pre-tax Earnings	134	23.0%
Property & Other Taxes (3.5%)	(12)	
Royalties (1/8)	(18)	
Income Taxes (41.1%)	(50)	
After-tax Earnings	54	15.5%

Total revenues are $200 billion, based on 40 Tcf of production and a $4.00 gas price that escalates 2% a year. Capital costs are $15 billion for the pipeline plus $3 billion for additional upstream investments in gas conditioning and NGL extraction. Combined operating costs are assumed to be $0.50 per MCF. Subtracting capital and operating costs from revenues leaves $134 billion to be allocated among Arctic gas producers and pipeline investors and governments. Almost 60% ($80 billion) of pre-tax earnings flow to governments at all levels in the form of taxes and royalties based on the assumptions shown here. This leaves $54 billion available to production and pipeline investors for a combined DCF return of 15.5%. This return is probably not high enough for the financial markets, so I wouldn't expect it to be enough for producers either.

Government Support

Governments can increase investment returns by reducing taxes and reducing the cost of financing. Recent federal legislation makes important contributions to both.

Federal Legislation

- 7-year accelerated tax depreciation
- Loan guarantees for 80% of project costs up to $18 billion (escalated for inflation)
- 15% tax credit on AK gas treatment plant
- Expedited approval process

The legislation allows faster depreciation, which increases investment returns by postponing income taxes. It also reduces financing costs by providing $18 billion of loan guarantees backed by the full faith and credit of the U.S. Government. There also is a tax credit that reduces the cost of gas treatment facilities by 15%.

Taken together, these incentives do improve the risk/return tradeoff for investors. However, I do not believe they will be sufficient to finance the pipeline. To understand why requires closer examination of the debt guarantee provisions.

The loan guarantees apply to all investments associated with moving Alaskan gas to the lower 48 states. This is more than the cost of building a pipeline; it also includes production facilities and other investments that may be required to deliver Arctic gas supplies to U.S. markets. To qualify for the guarantees, the sponsors must meet certain conditions, which are summarized in the next slide.

The guarantees are contingent on project sponsors providing equity capital and completion guarantees. Neither of these preconditions is defined in the legislation, but the clear implication is that sponsors must undertake to complete the project regardless of the ultimate cost.

A related issue goes to the meaning of term "completion". In this context, completion normally refers to delivering a minimum volume of gas within a specified time interval. Under this definition of completion, gas must be both produced and delivered to market. This forces pipeline sponsors to guarantee completion of gas production facilities as well as the pipeline and any other facilities that may be needed to deliver the gas to consumers.

These completion guarantees pose a serious impediment to financing the pipeline because they leave sponsors on the hook for all costs if completion is not achieved. This is an enormous open-ended risk that few investors can bear; and those who can will require compensation for doing so.

I will use my generic economics to show how sponsors could be compensated for this open-ended risk.

Generic Example

- Assume sponsors provide completion guarantees in exchange for 16% return on pipeline costs until “completion” is achieved
  - AFUDC capitalized and added to rate base
  - 80% of pipeline costs financed with long-term debt guaranteed by USG
  - 20% of costs financed with equity
  - No interest or dividends paid during construction

Let’s assume pipeline sponsors are willing to provide the necessary completion guarantees in exchange for a 6% risk premium on top of a conventional pipeline return of 10%. Also assume this return is not paid currently, but rather capitalized and added to the rate base instead.

With completion guarantees in place, 80% of the pipeline’s $15 billion estimated cost can be financed with government guaranteed debt. Let’s assume the other 20% is financed with equity and that no dividends are paid during construction.

Generic Pipeline Economics

	Fed Loan Guarantees +7 yr. ACR	Reference Case
AFUDC - %	16%	10%
AFUDC - $ Billions*	$5.3	$3.2
Financing		
Debt	80%@5.90%	60%@8.3%
Equity	20%@12.5%	40%@12.5%
Rate Base Return	7.2%	10.0%
Levelized Tariff ($/Mcf)	$1.88	$2.26
Pipeline DCF Returns		
Total Capital	9.8%	10.0%
Equity	20.3%	11.4%

* Based on $5 billion Capex per year for 3 years

The numbers in the Reference Case column summarize the generic pipeline case I described to you earlier. The other column shows how the completion risk premium, federal debt guarantees and faster tax depreciation rules would affect the pipeline economics.

The government guaranteed debt is assumed to cost 5.9%, compared to 8.3% without the federal guarantee. The lower rate was derived from average historical spreads between long-term triple-B corporate bonds and U.S. Treasury bonds.

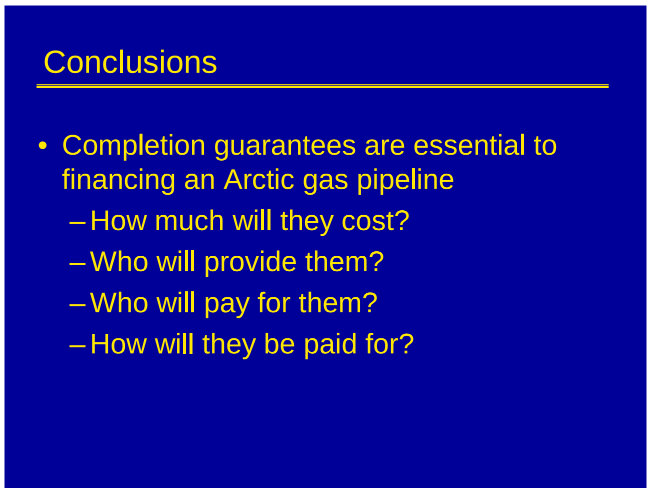
Before completion, project sponsors are at risk for the entire cost of the project, even though 80% of it is financed with government guaranteed debt. To compensate for this risk, sponsors receive a return premium equal to the difference between 16% and the cost of financing, but only if gas is delivered at competitive prices.

After completion, the debt becomes non-recourse to project sponsors and the 6% risk premium disappears. In this example, the cost of debt remains at 5.9% due to the presence of federal debt guarantees and the cost of equity is assumed to be the same 12.5% used in the Reference Case.

The cumulative effect of the changes is a reduction in the levelized tariff from $2.26 per Mcf to $1.88. Although the average return on debt and equity remains about the same as before (9.8% versus 10.0%), the expected return to project sponsors and equity holders is now 20.3%.

I chose a 6% completion risk premium in this example because it provides a 20% DCF return to project sponsors. I think this is probably about what financial markets deem to be a fair return for a project with this much risk.

Conclusions



I have covered a lot of ground in the short time allotted, and this has not permitted me to give you more than a quick gloss on a number of complex issues. However, the crucial message I hope to leave with you is that completion guarantees will be essential to financing an Arctic gas transportation system and conventional pipeline returns are too low to attract the amounts of capital required. Even with higher returns, it will be difficult to find sponsors willing and able to shoulder the completion risk.

Traditional gas pipeline companies are already highly leveraged. Exposure to the completion risk could bankrupt them, unless they were allowed to recover the cost of failure from rate payers, which seems unlikely. Venture capital and private equity firms probably would object to the open-ended nature of the completion risk, regardless of the return that is offered. Arctic gas producers are probably the only sponsors capable of shouldering the risk, but this would not necessarily rule out other equity investors.

With regard to payment mechanisms, U.S. taxpayers are already shouldering a substantial burden in the form of debt guarantees, income tax deferrals and investment tax credits. The logical collection system is the cost of service. But here again it is important to remember that U.S. consumers won't buy the gas unless the delivered cost is competitive with other sources of energy at that time. And that means producers will still be on the hook.