SUGGESTIONS FOR NEW TERMS FOR THE ALASKA NORTH SLOPE LNG PROJECT

EXECUTIVE SUMMARY

by

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TABLE OF CONTENTS

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1. INTRODUCTION

The North Slope of Alaska contains natural gas reserves of about 35 trillion cubic feet. Most of these reserves are contained in the Prudhoe Bay field. One of the ways in which these reserves can be produced is through the export of the gas in the form of LNG (liquid natural gas).

A possible LNG project could be an important source of revenues for the State of Alaska and would create significant employment and business opportunities. It is therefore important for the State of Alaska to analyze the possible optimal fiscal conditions under which this project would become a reality.

The Revenue Department of the State of Alaska requested the consultant to provide a report on possible new fiscal and other terms for the Alaska North Slope LNG project. The study is based on a comparative analysis of international LNG terms and conditions. This executive summary reflects the main conclusions and recommendations of this analysis.

2. PROJECT DESCRIPTION

A possible initial LNG project could produce and export about 14.5 million tons of LNG per year. This level might be reached over a six year period increasing sales volumes by about 2.5 million tons per year. The project would use initially the gas reserves of the Prudhoe Bay field. A large conditioning plant, a large diameter gas pipeline and a liquefaction facility in Valdez would be required. A fleet of about 14 LNG tankers would ship high Btu gas to East Asian markets starting in the 2005 - 2010 period. This project configuration was used as the basis for the recommendations in this executive summary.

Alternative configurations of the project are also possible. A gas pipeline could be built to the northwestern Alaska coast and ice-breaking LNG tankers could be used for the gas export. The Point Thomson gas reserves could be used from the start of the project.

The ramp-up speed is an important economic variable in the project and could be faster than the 6 years assumed in the basic project configuration.

3. PRINCIPLES OF FISCAL RESTRUCTURING

A sound fiscal system for oil and gas resources provides the appropriate balance between two interests of the State:

- **-- the need to encourage an attractive level of economic activity, and**
- **-- the need to extract the highest possible share of the economic rent.**

The combination of the two objectives results in an optimal rate and timing of the development of the resources for the State.

3.1 ENCOURAGEMENT OF ECONOMIC ACTIVITY

In order to encourage economic activity in the development of the North Slope gas resources the fiscal terms and conditions have to result in a profitability of investments that is competitive with other investment opportunities in the petroleum sector on an international basis. The level of profitability has to be commensurate with the risk.

The more lenient the fiscal terms, the higher the level of economic activity that can be expected, assuming that the resource base is inherently economic on a "no-government take" basis. The fiscal terms should not be more attractive than what is necessary to achieve the desired economic activity.

3.2 THE GOVERNMENT TAKE

The government take in Alaska comes in the form of bonuses, rentals, royalties, severance tax, corporate income tax and property tax. In other jurisdictions in the world, there is also a wide variety of other mechanisms to obtain a share of the economic rent, such as production sharing, participation, R-factor or ROR based profit sharing and special taxes.

What is important in fiscal restructuring is to achieve the highest possible level of the government take as well as creating the optimal structure of the government take.

3.2.1 LEVEL OF GOVERNMENT TAKE

The level of the government take is determined by the competitive conditions.

In the case of the Alaska North Slope LNG project the competitive conditions do not only apply to the profitability of the investment opportunities, but relate also to the market access of the gas. The fiscal system has to enable investors to conclude the necessary gas sales in the East Asian region.

One of the consequences is that the fiscal structure Alaska LNG project as a whole - the upstream and well as the downstream - has to be considered.

3.2.2 STRUCTURE OF THE GOVERNMENT TAKE

With respect to the structure of the government take there are two important issues, which are progressivity and back-end loading.

3.2.2.1 PROGRESSIVITY

A progressive fiscal system is a system whereby the government take is modest in case of conditions of low profitability and high in case of high profitability. A progressive fiscal system achieves the highest level of economic activity in conjunction with the highest level of economic rent extraction.

A regressive fiscal system is a system whereby the government take is high in case of conditions of low profitability and low in the case of high profitability. A regressive system results in a situation where marginal projects will not be undertaken and whereby the government is not earning the highest possible economic rent in case of high profitability.

The most efficient way to promote optimal economic activity with effective economic rent collection is therefore to adopt a progressive system.

It should be noted, however, that progressive systems have a drawback for governments. They result by their very nature in important swings in government revenues if there are important changes in prices or costs. In order to properly manage a progressive fiscal system a government has to have a "buffering" system in place, such as a special fund to which government contributes when prices are high and which the government could use in case prices are low.

At the same time it should also be noted that large corporations look for "upside" in an investment and a severe reduction of the upside would reduce the investors interest in the project.

In economic environments where gas prices or development costs are difficult to predict a progressive system is much less risky to the investor than a regressive system, because the project will automatically show acceptable profitability over a much wider range of economic possibilities. Progressive fiscal systems therefore reduce project risk.

3.2.2.2 BACK-END LOADING

A back-end loaded fiscal system means that the government take during the first years of the cashflow is less than the government take during the latter part of the cashflow. A front-end loaded system has a high government take during the initial years.

Back-end loaded systems permit the investor to recover most or all of his investment prior to being subject to a high government take. The advantages of this approach are that it:

– reduces project risk because the payout period is shorter, and
– it increases the rate of return.

Back-end loaded systems usually result in a better balance between the investor's and the government's objectives. The discount rate used by investors to evaluate an investment opportunity is typically higher than the discount rate used by government in order to assess its income stream of government revenues. Therefore a government could obtain a higher overall government take, at the government's discount rate, provided the government take is back-end loaded.

4. CURRENT FISCAL TERMS

4.1 DESCRIPTION

The description includes all fiscal provisions. For the economic analysis of the Alaska LNG project one would only apply the fiscal provisions which belong to the decision to make an incremental investment in the LNG project. This means one would not take the bonuses and rentals into account in the economic analysis.

4.1.1 UPSTREAM

4.1.1.1 BONUSES

Alaska employs a system of competitive bonus bidding for the allocation of acreage.

4.1.1.2 RENTALS

Surface rentals in the Prudhoe Bay area are $ 1 per acre.

4.1.1.3 ROYALTIES

Royalties for Prudhoe are 12.5% of the value at the lease boundary. A processing allowance of $ 0.18 per Mcf is permitted for gas as a deduction from this value. This allowance escalates with inflation.

4.1.1.4 SEVERANCE TAX

The severance tax rate for oil is 12.25% for the first 5 years and 15% thereafter and for gas it is 10%. The severance tax is calculated on the value at the lease boundary less royalties. For gas there is a processing allowance of $ 0.20 per Mcf (assumed pending draft regulations). Also there is minimum severance tax of $ 0.064 per Mcf regardless of the price.

The severance tax for oil and gas is reduced by the Economic Limit Factor (ELF). This factor varies between 0 and 1 and depends on the daily well production in the case of oil and gas and also total daily field production in the case of oil.

4.1.1.5 CORPORATE INCOME TAX

The federal corporate income tax rate is 35%. Losses can be carried forward and interest is a deductible expense. Depreciation for federal purposes varies from asset class to asset class and is based on the MACRS system. Typically, the conditioning plant would be depreciated over 8 years.

The Alaska corporate income tax rate is 9.4% applied on a unitary world-wide basis of income. The experience of Alaska is that Alaska only receives about half this amount as a result of the apportionment procedures. The Alaska corporate income tax is deductible for federal corporate income tax purposes, creating a total tax rate of 41.1%.

The Alaska corporate income tax also permits the carry forward of losses and the deduction of interest. Depreciation rates are based on the Asset Depreciation Range (ADR), which varies by asset class. Typically, the conditioning plant would be depreciated over 12 years.

4.1.1.6 PROPERTY TAX

A 20 mill (2 percent) property tax applies based on the replacement cost of the asset value and determined on the basis of the remaining life of the asset. The property tax is applied during the construction period of the asset.

4.1.2 DOWNSTREAM

4.1.2.1 CORPORATE INCOME TAX

The same federal and state corporate income tax applies to the downstream. The federal depreciation period for LNG carriers is over 11 years and for the gas pipeline and the liquefaction plant over 16 years. The State depreciation period for the LNG carriers is over 15 years and for the pipeline and liquefaction plants over 18 years.

4.1.2.2 PROPERTY TAX

The same property tax applies to downstream operations. LNG carriers are not subject to property tax. Also, the State does not levy a property tax on liquefaction. The municipalities do levy such a tax.

4.2 RATE OF RETURN AND GOVERNMENT TAKE EFFECTIVENESS

The fiscal features applied in Alaska can be characterized as follows:

– royalties and severance taxes - Since the royalties and severance taxes are determined on a net-back basis and most of the incremental costs are downstream of the value determination point, the royalties and severance taxes actually function as a profit share which is slightly progressive on a total project basis, despite the fact that the royalties are based on the gross value of the production. Royalties by their very nature are usually front-end loaded when considering the upstream only.

– corporate income tax. Corporate income tax is a neutral feature (neither progressive nor regressive) because the tax is profit based. The corporate income tax is strongly front-end loaded because of the very slow depreciation rates.

– property taxes. Property taxes are strongly regressive and strongly front-end loaded.

On average, the total Alaska fiscal system (Federal, State and local) is:

-- slightly regressive or slightly progressive on a total project basis depending on the economic conditions and the tax position of the investor, and

-- front-end loaded.

This means that the Alaska fiscal system is not optimal for an LNG project.

The rate of return to the investors is less than it needs to be. The rate of return is particularly negatively affected under marginal economic conditions. However, under high price scenarios, the total government take is less than it could be.

The current Alaska fiscal system could therefore be improved in order to make the LNG project more attractive by making the project more profitable and less risky. The system could also be improved by making it a more effective economic rent collector.

5. COMPARATIVE ECONOMICS

5.1 FINANCIAL EVALUATION CRITERIA

5.1.1 HURDLE RATE

Probably the most important yardstick for assessing the profitability of the Alaska project is the "hurdle rate".

The hurdle rate is the minimum cashflow rate of return that the project has to have in order to be considered economically attractive by the investors. Many companies determine the hurdle rate after all taxes and before financing. The hurdle rate can be determined on a current or constant dollar basis. The hurdle rate depends on many factors, such as the rate of return of other opportunities, the average cost of capital, the project risks and financing opportunities.

Hurdle rates are different from company to company because the factors that determine the hurdle rate are different for each company. This means that some companies may consider a project profitable while others may not. For large projects, companies may have different hurdle rates per project depending on the project risk.

5.1.1.1 OTHER OPPORTUNITIES

The petroleum industry is a global industry. All large oil companies are constantly assessing and re-assessing investment opportunities on an international basis with respect to their profitability and risk. Companies usually select the projects that offer the best combination of profitability and risk for development. The number of selected projects depends on the availability of capital.

The hurdle rate will be relatively high when a company has ample highly profitable investment opportunities and limited capital resources. The hurdle rate will be relatively low when a company has few projects available and ample capital resources.

One can obtain an idea of the hurdle rate that companies use based on other opportunities, by analyzing known projects under development and calculating the rate of return for such projects.

This year Mobil launched the Ras Laffan LNG project in Qatar in the Gulf area. Detailed information is available for this project. The rate of return for this project is approximately 13.5% under a $ 3.50 per MMBtu CIF price scenario in Korea and 15.3% for a $ 3.90 scenario. This rate of return is determined on a total project basis, including shipping and on a stand alone and a "before financing" current dollar basis ("Project ROR").

The rate of return on a Qatar LNG project is very important for Alaska, because Qatar has 250 trillion cubic feet of gas available and could therefore launch more LNG projects or expansions of the current projects if investors are interested and the markets are available.

Along with Ras Laffan, there are a number of other projects that are ahead in the time line compared to the Alaska North Slope project. The information on other LNG projects is less detailed than for Ras Laffan. However, based on reasonable assumptions about construction costs and other factors the rate of return of these projects can be estimated as follows:

PROJECT ROR OF ONGOING PROJECTS		
Price Scenario ($/MMBtu)	$ 3.50	$ 3.90
Ras Laffan	13.5%	15.3%
Qatargas	14.7%	16.8%
Oman-Shell	14.1%	15.8%
Australia - NW Shelf	13.3%	14.8%

This indicates that the competitive rate of return for LNG projects that are being launched at this moment is in the range of 13 - 17% for the price range of $ 3.50 to $ 3.90 per MMBtu CIF Korea or Japan on a total project basis.

5.1.1.2 COST OF CAPITAL

The hurdle rate has to be equal to or higher than the weighted average cost of capital after adjustment for risk. The weighted average cost of capital of a company is the after tax cost of all its capital sources in the form of debt and equity. For large oil corporations with a relatively modest debt, the current cost of capital can estimated in the range of 9% to 11%. It is not economic for a corporation to invest in a project if the project does not make at least a rate of return that is equal to the weighted average cost of capital after adjustment for risk.

Successful companies have projects with rates of return that are above the weighted average cost of capital.

5.1.1.3 ALASKA PROJECT RISK

The relative risks of the projects is also an important factor in deciding about the attractiveness of a project and in deciding about the hurdle rate for the project. It should be noted that relatively speaking the Alaska project cannot be considered a low risk project under current conditions. There is a great variety of project risks. The following table is a comparison between the Alaska project and the Ras Laffan project of the project risks involved:

RELATIVE PROJECT RISK ALASKA - 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	Aver - High	High
Regulatory/legal risk	High	Low
Risk of cost overruns	High	Low
Market access risk	High	Average
Fiscal stability risk	High	Low

The relative risks find their expression in the financing terms that the market would be willing to provide. Indications are that the market would provide debt financing to an Alaska project under more favorable terms than for the Ras Laffan project, largely as a result of the low country risk. Yet, the project investor's risks may be evaluated higher or lower than Ras Laffan by the investors.

The netback value for gas would be substantially positive if the costs for the Alaska project could be reduced substantially to the $ 12 billion level. This would create an average price risk. The price risk can be substantially reduced by the State through a the revisions in the fiscal system suggested in this report. These revisions would lower the cost of service of the downstream and thereby increase the netback value and lowering the price risk, because even with lower international prices there would still be a positive netback value.

However, in case of substantial cost overruns, the netback value becomes lower and may even become negative, creating a very high price risk.

The market access risk in the case of Alaska is high because of the large size of the project. A typical example is Ras Laffan whereby Mobil has decided to go ahead with the first 2.4 million tons per year capacity without waiting for contracts to be finalized for the second 2.4 million tons. The large size of the Alaska project makes it unlikely that all gas can be marketed prior to project start-up.

Because of the need to built a large distance pipeline, the Alaska project would not be economic unless all steps of the 14.5 million ton project would be completed. This creates a significant market access risk.

The overall degree of risk would result in a risk adjustment of the hurdle rate. The rate could be adjusted upward or downward depending on the perception of risk.

In very high risk circumstances such as for the Sakhalin project, it might well be that the hurdle rate would be two or three percentage points higher.

For Alaska there is an opportunity to create a relatively low risk environment. Companies could reduce the cost overrun risk through more detailed initial analysis. The government of Alaska could assist in reducing the regulatory/legal risk and the fiscal stability risk. Furthermore, the government could reduce the cost overrun risk and price risk by creating a higher netback value for the gas through the fiscal system. A significant reduction of the risk could result in a lowering of the hurdle rate by one percentage point or more.

5.1.1.4 FINANCING

With respect to the Alaska LNG project it is important to emphasize that the analysis of the project on a no-financing basis does not do the Alaska project justice. In the United States, interest is a tax deductible expense. Furthermore, the financial markets perceive North America as a low risk area in which a high leverage of the downstream operations is possible.

Finally, the incremental investments in the Alaska LNG project are primarily in downstream operations which are highly financeable.

The high degree of financeability of the downstream operations makes the incremental cost of capital less than the weighted average cost of capital of the corporation.

Given these considerations it is important to consider the comparative economics either on an after financing basis or provide some decrease in the hurdle rate in order to recognize these factors. The rate of return after financing would be the rate of return on equity ("Project ROE"). This means the rate of return on total capital less the debt.

5.1.1.5 TOTAL PROJECT VERSUS ITS COMPONENTS

The risk on the total project and its components are not necessarily the same. The downstream components could be constructed under relatively low risk contractual arrangements with the producers. The producers would run the risk of cost overruns, price declines and other risks.

Therefore, for the determination of the netback value and for royalty purposes one would use a rate of return that is lower than the total project rate of return and would represent the lower risk. Also the costs of capital for the downstream components is typically lower than for the upstream component. The rate of return would be a Cost of Service rate of return.

In order to assume all the project risks, the liquid penalty and earn a reasonable return on the project development investments, the producers will have to have a reasonable minimum netback value for the gas. It can be estimated that this value is about $ 0.98 per Mcf. If downstream operators would assume more risk, this value could be lower but in this case the cost of service of the downstream operations increases because of the need for a higher rate of return in order to assume this risk.

5.1.1.6 RISK ADJUSTED HURDLE RATE

Under the current economic conditions a typical hurdle rate under a price scenario of $ 3.50 per MMBtu would be about 13% for Middle East type risks. However, Alaska should be able to reduce risks considerably. Therefore, assuming that Alaska would take such measures, companies may adopt a 12% hurdle rate for the Alaska LNG project.

Under a price scenario of $ 3.90 per MMBtu all LNG projects in the world become more profitable and the alternative opportunities therefore become more profitable. Therefore an alternative target at $ 3.90 per MMBtu would be 14%, again on the assumption than Alaska would reduce risks substantially.

It should be noted that different companies may adjust differently for risk because the risk perceptions as well as the abilities to absorb risk are different among companies. Also the method of adjusting the hurdle rate by adjusting the percentage is somewhat subjective.

5.2 ANS LNG PROJECT PROFITABILITY ANALYSIS

An economic sensitivity analysis of the project was done using investment costs ranging from $ 15 to $ 12 billion. The analysis was based on the currently applicable fiscal terms and conditions. For the CIF price range of $ 3.50 to $ 3.90 per MMBtu, the Project ROR ranges from 8.9% to 11.6% as indicated in the table below:

TOTAL PROJECT ROR OF ANS LNG PROJECT		
Price Scenario ($/MMBtu)	$ 3.50	$ 3.90
Alaska - $ 15 billion	8.9%	9.7%
Alaska - $ 13.5 billion	9.8%	10.6%
Alaska - $ 12 billion	10.8%	11.6%
HURDLE RATE:	*12.0%*	*14.0%*

The above rate of return is determined on a consolidated basis, this means that it is assumed that companies can take their deductions for corporate income tax as the project proceeds. The analysis was also done on a current dollar basis.

The rate of return is dependent on the ramp-up speed of the project. A unique feature of the Alaska project is that a long distance high cost gas pipeline is required. The quicker this line can be filled with production, the higher the rate of return will be. If the ramp-up would be 3 years, the ROR would be approximately 0.7% higher. Such a fast ramp up, however, is improbable due to market restrictions. Currently, the total Pacific LNG market is increasing by about 2.5 million tons per year and many projects compete in this market.

It therefore appears that the Alaska North Slope LNG project is not economic under current conditions, even if the costs could be dropped to $ 12 billion and the ramp-up speed could be increased.

However, improvements in the fiscal system together with a reduction of project risk could make the project attractive.

5.3 ALASKA PROJECT ON THE BASIS OF OTHER FISCAL SYSTEMS

5.3.1 OVERALL FISCAL BURDEN

The overall fiscal burden imposed by Alaska on a possible LNG project is tough in comparison with other LNG exporting countries.

The relative burden can be most accurately measured by applying the fiscal terms of other jurisdictions to Alaska North Slope economics.

In such a comparison the economics of Alaska, Canada and Australia are measured on a consolidated basis and the economics of the other LNG exporting countries is measured on a stand alone basis. The following table provides the comparative analysis of the ROR for two scenarios, $ 15 billion costs with a price of $ 3.50 and $ 13.5 billion costs with a price of $ 3.90:

TOTAL PROJECT ROR OF DIFFERENT FISCAL SYSTEMS BASED ON ALASKA ECONOMICS			
	Costs/price:	15B- $ 3.50	13.5B- $ 3.90
	Project:		
ALASKA	North Slope	8.9%	10.6%
INNER CIRCLE-LOW COST:			
Brunei	Lumut	8.7%	10.2%
Indonesia	Arun	9.1%	10.6%
Malaysia	Bintulu I ,II	5.6%	7.1%
Malaysia	Bintulu III	5.5%	7.0%
Vietnam	Offshore	9.1%	10.0%
OUTER CIRCLE-HIGH COST:			
Abu Dhabi	Das Island	9.1%	10.8%
Australia	All projects	9.8%	11.5%
Canada	PACRIM	9.9%	11.4%
Indonesia	Irian Jaya	10.0%	11.9%
Indonesia	Natuna	10.2%	12.2%
Oman	Shell	10.3%	12.4%
PNG	Hides	10.0%	11.8%
Qatar	Qatargas	9.7%	12.2%
Qatar	Ras Laffan	9.4%	11.4%
Russia	Sakhalin II	9.9%	11.2%
Yemen	Hunt	9.7%	11.1%

The "inner circle-low cost" jurisdictions are areas which have both a short shipping distance to Korea and Japan and have low gas development costs. Fiscal terms in these areas can be expected to be relatively tough because these gas resources are being produced under favorable economic conditions. It can be seen how the terms of these jurisdictions are indeed equal to or tougher than those of Alaska for investors.

The "outer circle-high cost" jurisdictions are areas which have either a high shipping cost to Korea and Japan because of large transport distances or have high gas resource development costs or both. These jurisdictions have to offer - on average - better terms in order to be competitive. Alaska belongs in this group.

It can be noted that all jurisdictions in this group offer better terms and conditions than Alaska resulting in a higher rate of return to investors, when the fiscal terms are applied to Alaska economic conditions.

This is a very strong indication that the Alaska fiscal terms are not competitive with the "outer circle-high cost" jurisdictions.

5.3.2 STRUCTURE OF THE GOVERNMENT TAKE

An important issue in international fiscal systems is the structure of the fiscal system. The structure of the fiscal system can be analyzed by reviewing the level of government take under various scenarios.

The government take is defined as the percentage that the government obtains of the economic rent. The government take is usually expressed as a percentage of the undiscounted rent, although economic rent is usually determined on a discounted basis.

The following table provides the undiscounted government take in percent for the two scenarios:

GOVERNMENT TAKE OF DIFFERENT FISCAL SYSTEMS BASED ON ALASKA ECONOMICS			
	Costs/price:	15B- $ 3.50	13.5B- $ 3.90
	Project:		
ALASKA	North Slope	40.4%	41.7%
INNER CIRCLE-LOW COST:			
Brunei	Lumut	46.6%	49.8%
Indonesia	Arun	57.5%	59.9%
Malaysia	Bintulu I ,II	61.2%	66.4%
Malaysia	Bintulu III	61.2%	66.4%
Vietnam	Offshore	38.2%	47.9%
OUTER CIRCLE-HIGH COST:			
Abu Dhabi	Das Island	44.4%	45.6%
Australia	All projects	33.7%	36.1%
Canada	PACRIM	35.2%	39.9%
Indonesia	Irian Jaya	48.7%	50.7%
Indonesia	Natuna	25.6%	25.9%
Oman	Shell	21.6%	19.4%
PNG	Hides	27.3%	28.1%
Qatar	Qatargas	33.1%	30.8%
Qatar	Ras Laffan	34.4%	33.7%
Russia	Sakhalin II	37.5%	38.2%
Yemen	Hunt	35.3%	49.5%

The government take can be defined on a "No Participation" basis or a "Participation" basis. A "No Participation" basis means that the cashflow as a result of direct government equity participation is not being taken into account. A "Participation" basis means that this cashflow is included. The above table is on a "No Participation" basis.

In terms of the overall level of government take it can be noted how the government take in the "inner circle-low cost" jurisdictions is typically higher than for the "outer circle-high cost" jurisdictions.

This means that most governments of the "outer circle-high cost" group compete by offering a lower government take. This compensates for the higher gas development costs and longer transport distances.

The progressivity of the fiscal systems can be analyzed by comparing the $ 15 billion-$3.50 case with the $ 13.5 billion-$3.90 case. The results are as follows:

– Vietnam and Yemen have strongly progressive systems,
– Brunei, Malaysia, Indonesia (Arun and Irian Jaya), Australia and Canada have progressive systems,
– Alaska, Abu Dhabi, Indonesia (Natuna), PNG and Russia have very slight progressive systems or neutral systems, and
– Oman and Qatar have regressive systems because the government take goes down under more favorable conditions.

What is also interesting to note is that some governments are able to generate a relatively high rate of return on the basis of a higher government take than Alaska. For instance, Yemen under the $ 13.5 billion case has a government take of 49.5% compared to Alaska's 41.7%. Yet, the rate of return under the Yemen contract would be 0.5% higher. The reason is that the Yemen contract is strongly back-end loaded while the Alaska contract is strongly front-end loaded. Another interesting example is Abu Dhabi which uses accelerated depreciation for tax purposes in order to make the system back-end loaded. Canada generates also a higher rate of return through accelerated depreciation.

A special case is Indonesia, which actually "subsidizes" the project through the direct investment in liquefaction. Indonesia compensates for this arrangement through a higher government take (except for Natuna).

This means that the "outer circle-high cost" countries compete by introducing one or more of the following fiscal concepts in their fiscal system:

- a lower government take
- a progressive government take, making the $ 3.50 case more attractive,
- a back-end loaded government take, or
- investment "subsidies".

Alaska employs none of these features and it is therefore that the Alaskan terms are the least attractive for investors among the "outer circle-high cost" jurisdictions.

In addition to the basic government take, many jurisdictions employ direct government equity participation in the project. This is in particular the case for Qatar, Abu Dhabi, Oman, Yemen, Brunei and PNG. This increases the government take on a "Participation" basis substantially. However, these governments share in this case the commercial risks with the investors.

5.4 COMPETITIVE POSITION RELATIVE TO OTHER PROJECTS

5.4.1 ALASKA ON THE TIME LINE

The projects in Qatar (Ras Laffan and Qatargas), Oman and the NW Shelf expansion project all are ahead on the time line relative to Alaska. The Qatargas project has already started. Oman and Ras Laffan have already specific sales contracts.

The total production capacity of the four projects together is 23.4 million tons of LNG per year. As indicated, the projects also have a Project ROR which are more attractive than the current Alaska project. It is unlikely that the Alaska North Slope project could be launched ahead of these projects.

The Alaska project would therefore primarily compete with a second tier of projects.

5.4.2 COMPETITION WITH RESPECT TO SECOND TIER PROJECTS

The economic information on most of these projects is still rather limited. Project ROR figures for these projects are therefore only indicative. Only very generalized economic analysis can be done with a wide range of error.

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 exploraing 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.

5.6 EXPANSION ECONOMICS

An important justification for possible fiscal improvements is the fact that the Alaska project as described here is really only a Phase I of a possible broader undertaking. Phase I involves the sale of 17 trillion cubic feet of gas and the corresponding production of about 19.5 trillion cubic feet (about 2.5 trillion cubic feet is necessary as energy source for conditioning, pipeline transport, liquefaction and storage and for boiloff during marine shipping).

The Alaska North Slope contains at least 35 trillion cubic feet and may prove to contain much larger reserves after companies start to explore specifically for gas.

There is scope for a profitable Phase II of the project. The level of profitability depends, however, very much on the development costs of the additional gas reserves.

It should be noted that apart from 26 Tcf in Prudhoe Bay and 3 Tcf in Point Thomson, the remainder of the current reserves is in relatively small fields which would high development costs per Mcf. Furthermore, Prudhoe Bay gas are also needed as fuel for the oil operations.

5.7 MAIN ADVANTAGES AND DISADVANTAGES OF THE ALASKA PROJECT

The main advantages of the Alaska project are:

- the potential ability to invest under consolidated tax conditions,
- the ability to raise financing under relatively favorable terms, and
- the availability of a large proved gas reserves which do not require substantial initial incremental investments for production.

The main disadvantages of the Alaska project are:

- the need for a high cost long distance gas pipeline in order to connect the gas to the coast,
- the required large size of the project, which results in a ramp up speed which is slow on a total project basis compared to other projects and results in increased market risk, and
- the lack of additional condensate production along with the gas production, and the existence of a liquid penalty because early gas production will result in a lower recovery of liquids

6. INCREASING PROFITABILITY

In order for the Alaska LNG project to take place the competitiveness and profitability of the project have to be increased. This can only be achieved on the basis of:

a) an active program on the part of the corporations in order to evaluate whether costs can be reduced, and

b) a cooperative approach between the State Government, the Federal Government and the local governments with respect to improving fiscal terms and reducing project risk.

Unless all four parties are willing to make a contribution to increasing the competitiveness and reducing the risk of the project, it would be difficult to reach the minimum objectives.

The increase in competitiveness should be primarily achieved by reducing the government take on the downstream portion of the project. By reducing the government take on the downstream, the netback value will be increased which in turn will lower the cost overrun risk and the price risk. This risk can be further reduced by reducing the upstream government take under conditions of low netback prices.

6.1 STATE AND FEDERAL INCENTIVES

The State and the Federal government could seek to improve the competitiveness of the project considerably by solving two important issues:

- the slow rate of depreciation, and
- the high combined tax rate.

6.1.1 ACCELERATION OF DEPRECIATION

The depreciation should preferably be brought in line with worldwide conditions for LNG plants. This means that an accelerated depreciation of 20% straight line per year should be the target. The change in depreciation should be proposed in such a way that it does not result in impacts on other tax payers.

This can be achieved by:

– targeting the liquefaction plants and the LNG carriers for accelerated depreciation, or/and

– targeting a specific class of "frontier projects" or "LNG projects" for an accelerated rate.

The IRS has already some discretion to specify accelerated depreciation for certain classes of assets and therefore such a change may not require new Federal legislation.

6.1.2 TAX CREDITS

The negative impact of the high overall tax burden could reduced by introducing a tax credit. A total State and Federal tax credit of 10% could be proposed. A tax credit would be a highly effective way to stimulate the project since it is an excellent mechanism to lower the net after tax investment cost of the project.

6.1.3 FEDERAL JUSTIFICATION

There is ample justification for the above measures from a Federal perspective. As a result of the tax improvements, the Alaska North Slope project will come one step closer to reality. The project would establish for the Federal Government a very significant new source of taxable income. The project would generate on an undiscounted basis billions of dollars in corporate income tax for the Federal Government. Based on a $ 12 billion and $ 3.50 per Mcf scenario, the project would generate $ 26.7 billion in tax income for the Federal Government over a 30 year period.

6.2 STATE AND LOCAL INCENTIVES

6.2.1 PROPERTY TAX

The State of Alaska and the municipalities could improve the project economics substantially by reducing the property tax.

The State may wish to make the entire project tax exempt for property tax purposes. The local governments could at least eliminate property tax during the construction period as well as the ramp up period.

Additionally one should consider a property tax holiday of 10 years from the end of the ramp-up period. However, one might consider a compensation package for the municipalities for this benefit.

For instance, the compensation could be in the form of "free" natural gas delivered to the municipalities at the pipeline in exchange for the property tax holiday and in lieu of the payment of property tax. Also agreement would need to be reached on the detailed calculation methods of the property tax.

There would be ample justification for the proposed measures from the point of view of the local governments. The project would bring considerable employment and business opportunities and would provide low cost clean energy and a considerable future source of property tax income.

6.3 STATE INCENTIVES

6.3.1 RELIEF ON MINIMUM SEVERANCE TAX

The State could remove the minimum severance tax in order to enhance the ability for the sellers of the gas to negotiate the lowest possible minimum sales price in case of oil price declines. Asian buyers are very concerned about minimum sales prices.

6.3.2 ROYALTY AND SEVERANCE TAX RELIEF

The current 12.5% royalty and the 10% severance tax are front-end loaded. The project risk could be reduced and the profitability under low netback conditions could be enhanced with a lower fiscal burden under these conditions. This relief is part of a more general restructuring of the royalty and severance tax to be described in the next chapter.

6.3.3 DETERMINATION OF NET BACK VALUE FOR ROYALTY AND SEVERANCE TAX PURPOSES

It can also be recommended to establish a more detailed and specific system on how the netback price for royalty and severance tax purposes would be calculated. The netback price should be based on the principle that each of the downstream components of the project should be a viable business by itself. A cost of service type rate of return should be included in the calculation of the cost of marine shipping, liquefaction, pipeline transport and conditioning for royalty net back value purposes.

The cost of service should be based on the assumption that the downstream operations are relatively low risk and that producers assume most of the project risks.

Such a calculation could result in a "deemed tariff" for these services for the purpose of royalty calculations.

The "deemed tariff" should apply regardless of whether the project has an integrated project structure or not. Therefore, the deemed tariff could be equal to or different from the actual tariffs or rates that would be charged from time to time.

6.4 TIME LIMITS AND WORK COMMITMENTS

A significant fiscal restructuring would be required in order to achieve the objectives of the State of Alaska. Most of these changes can be suggested as permanent changes to the fiscal system.

However, one may wish to establish some time limits on certain specific fiscal benefits which are being provided as a specific incentive for the LNG project.

Also it is important that the State of Alaska insist on a work plan on the part of the future investors in exchange for the fiscal benefits. The main objective of the fiscal improvements is to push the project forward. It is important that the producers demonstrate their willingness to make modest investments in feasibility work and studies.

7. INCREASING FAIRNESS AND REDUCING RISK

As indicated earlier Alaska should aim for obtaining the highest possible share of the economic rent commensurate with other economic objectives. A back-end loaded and progressive system could help in achieving these objectives. At the same time such systems reduce project risks for the investors.

7.1 CREATION OF BACK END LOADING

One could recommend to replace the current royalty and severance tax with a single back-end loaded and progressive royalty. This would provide a simplification of the fiscal system.

The single new royalty could be made more progressive back-end loaded by:

- removing the severance tax for gas,
- introducing a higher royalty in combination with a higher royalty allowance, and
- by making this royalty time related.

7.2 CREATION OF PROGRESSIVITY AND BACK-END LOADING

Very important variables in the creation of economic rent are the CIF price of gas and the downstream costs. A high price and low downstream costs create automatically a large economic rent. It is in the interest of Alaska to capture a large share of the economic rent that might be generated.

The royalty could be made more sensitive to the netback value by increasing the current allowance of $ 0.18 per Mcf to, for instance, $ 0.60 per Mcf. The average project royalty could be increased at the same time to, for instance, 30%.

This average royalty could then be re-distributed over a time frame related to the project. The royalty could start at 5% during the construction and ramp-up phase and could go up to rather high levels of say 40 - 60% depending on the detailed provisions of the formula that is applied. Such a formula needs careful consideration.

The creation of a progressive and back-end loaded royalty system make the determination of the net-back value for royalty purposes an essential component of the overall fiscal system, as already discussed in section 6.3.3

Also it should be recognized that the royalty would apply under the umbrella of a specific agreement on the Phase I royalties only. The royalties applicable to a possible Phase II should be judged on the basis of the economic conditions existing at the time that the decision about Phase II is being made and should take into consideration the need for possible considerable incremental investments to put new gas fields on stream.

Finally, it should be noted that the specific royalty formula needs to be designed in the context of the total fiscal package and should therefore be based on the final form of agreements reached between the levels of government.

8. NON FISCAL ISSUES

8.1 STATE PARTICIPATION

The State has currently a 12.5% royalty interest and therefore owns currently 12.5% of the gas. The State could consider co-investing in certain phases of the project on a 12.5% basis.

The most obvious targets for co-investment would be the pipeline and the liquefaction plant. The pipeline is the highest risk component of the project with respect to cost overrun risk. A participation of the State in the pipeline and the liquefaction plant would reduce project risk.

Alaska does not have a State company. The only possible equity source for possible co-investment would be the Permanent Fund. The current rules under the Permanent Fund would not permit such a co-investment. Alaskans may wish these rules to be maintained.

The Permanent Fund is not taxable. The Fund would not benefit from any possible accelerated depreciation or tax credits. Nor would the Fund benefit from deductions for tax purposes. Therefore the Fund would co-invest on a stand alone basis. This has a negative impact on the ROE. At the same time, however, the Fund would not pay tax, which has a positive impact.

The co-investment by the Fund could be an attractive proposition for the Fund, relative to the economics of the private investors participating in the same project.

The participation could help in sharing risk and could be an element in a fiscal stability arrangement.

The participation by the State of Alaska in the project would also enhance the confidence of the Asian buyers in the Alaska project, since it would be perceived as evidence of Alaska support for the project.

8.2 STATE FINANCING

An important provision that is available to Alaska is the fact that the State can arrange for financing packages whereby interest is not taxable on the part of the lenders. This creates the opportunity for borrowing at a lower rate. The ability to borrow under such conditions is limited however to specific purposes, such as ports and infrastructure. Some aspects of the project may be financed in this manner.

Also the distribution of risks and benefits of the State of Alaska is very different from the private investors. The State of Alaska will benefit from Phase II. The specific initial project investors might or might not.

Therefore, the State of Alaska could assume project risk by partially financing the project with long term loans.

The atractiveness of the project could increase if the State could use such tax supported financing and can assume project risk by lending under favorable conditions.

8.3 INFRASTRUCTURE DEVELOPMENT

Some governments in the world have promoted the LNG exports through very considerable direct infrastructure or project support. Qatar constructed an new $ 1 billion port. Indonesia assumes the construction and financing costs of the liquefaction plants and charges private investors for liquefaction on a cost basis.

The State of Alaska may be able to provide similar support to the project. This may be the case for improvements in the port in Valdez or similar infrastructural works.

8.4 FISCAL STABILITY

The ANS LNG project will not occur without a significant enhancement of the stability of the fiscal terms. The profitability of the project depends entirely on a comprehensive set of fiscal and financial measures. Without these measures the project is uneconomic. As a result, there has to be an acceptable degree of fiscal stability before investors can risk the investment in such a large project.

This fiscal stability does not exist at this time. The State of Alaska has the unilateral right to change taxes. This applies to severance taxes, property taxes and corporate income tax. All these taxes are major components of the fiscal structure.

Even if the current government would agree to a new fiscal package, the next government could change it. The State of Alaska could therefore take a number of measures that would help in establishing an environment of fiscal stability. Several measures are possible.

8.4.1 GENERAL BUDGET

Fiscal stability risk increases dramatically if the investors perceive that the government strongly needs additional revenue sources. A very important step in creating an environment of fiscal stability is therefore to develop the government's finances in such a manner that investors perceive that the State's income and State's financial resources will reasonably cover the State's outlays during the first 20 years of production of the project.

8.4.2 CONSTITUTIONAL BUDGET RESERVE FUND

The current Constitutional Budget Reserve Fund of $ 3 billion is a stabilizing factor. It would reduce perceived risk if this fund could be maintained on the basis of prudent budget management.

8.4.3 FISCAL STRUCTURE

The overall nature of the fiscal structure helps in maintaining fiscal stability. A progressive and back-end loaded system is more stable than a regressive and front-end loaded system. The pressure for more government income over time is satisfied with a back-end loaded system, which automatically adjusts over time to higher levels of payments to government.

The fiscal stability is also enhanced with the development of a progressive system that provides for a fair sharing of the economic rent under a wide range of conditions. The perception of fairness of the system on the part of the public is one of the best fiscal stability factors.

8.4.4 A SPECIFIC STABILITY AGREEMENT

One of the great advantages of the production sharing and joint venture agreements in Asia and the Middle East is that it are agreements with a state company. The state company can agree to provide fiscal stability to the investor regardless of the actions to be taken by the national government.

Alaska could introduce a similar type of agreement. However, in this case the agreement would have to be directly with the State. It is an open question as to whether the Constitution permits such a contractual arrangement. The Constitution imposes some limits on the ability of the State to commit itself irrevocably to certain levels and kinds of taxation. Any agreement binding future legislators would most likely be considered un-constitutional or politically unacceptable by some legislators.

It seems that a reasonable middle ground could be the following:

– the State Legislature could pass a law permitting the government to enter into fiscal agreements for specific projects for a specific time period, for instance, no longer than 25 years (5 years for development and 20 years production),

– any such agreements would have to be specifically approved by the State Legislature,

– if the fiscal system changes in the future, such changes would not be applicable to the project for which the agreement exists and such agreements would be "grandfathered" under any such new law changing the fiscal system,

– it could be understood that the agreement could only be canceled or amended on the basis of a specific new law by the State Legislature.

This process does not provide for absolute fiscal stability, but it would come as close as one could reasonably hope for in the North American context. A formal agreement with the investors signed by the State and approved by the State Legislature would have a tremendous moral weight and it would be very damaging for the image of the State if the agreement would be unilaterally canceled or amended.

8.4.5 FINANCING PACKAGE

The long term State supported financing package may help to solidify the fiscal stability. The package may include certain conditions that would link the package to the fiscal stability. Since the State of Alaska would have guaranteed the financing package to the lenders, this would create considerable additional comfort on the part of the investors that the fiscal stability will "hold".

8.4.6 PARTICIPATION

The equity participation provisions could be part of the overall fiscal stability agreement.

9. CONCLUSIONS

In order to make the Alaska North Slope LNG project economic, three objectives have to be achieved:

1. The costs of the project have to be reduced substantially. The cost reduction should be preferably from $ 15 billion to $ 12 billion (in constant $ 1997)

2. The profitability of the project has to be improved through a fiscal package in which the Federal, State and local governments cooperate.

3. The risks of the project have to be considerably reduced.

9.1 COST REDUCTION

The analysis indicates that the rate of return of the project could be increased from about 9% to 11% through a cost reduction from $ 15 billion to $ 12 billion. The producers of the North Slope gas could therefore make a significant contribution to the project by evaluating whether the project could be launched at a much lower cost. This will require more detailed feasibility work. Cost reduction from the current estimate of $ 15 billion is essential if the project is to proceed.

9.2 IMPROVEMENT IN FISCAL TERMS

The application of all the improvements in fiscal terms discussed in this report will result in an increase in the Project ROR with more than one percentage point. The following table illustrates how the ROR could be improved relative to the current situation:

IMPROVEMENT IN ROR		
Price Scenario ($/MMBtu)	**$ 3.50**	**$ 3.90**
Alaska - $ 12 billion Current Terms	**10.8%**	**11.6%**
Alaska - $ 12 billion Improved Terms	**12.1%**	**12.9%**
Hurdle Rates	***12.0%***	***14.0%***

It can be noted how a $ 12 billion project at a price of $ 3.50 per MMBtu would be slightly over the risk adjusted hurdle rate of 12%.

For the $ 3.90 scenario the desirable target rate would still not be reached, which means that the Alaska LNG project still would not compare very well with other LNG projects around the world under this price scenario or higher price scenarios.

On the other hand, the project rates relatively better under lower price scenarios and would rate very high on a ROE basis. Also the minimum netback price of about $ 0.90 per Mcf would be far exceeded at the $ 3.90 CIF price level.

9.3 REDUCTION OF RISK

The proposed fiscal structure reduces cost overrun risk and price risk.

The State of Alaska could reduce project risk further through a detailed contractual arrangement with the producers, involving fiscal stability and a detailed definition of terms, including detailed calculation procedures for all fiscal components.

Based on such a package that involves considerable risk reduction companies may be prepared to consider a risk adjusted hurdle rate of 12%, based on CIF prices of $ 3.50 per MMBtu.

The combination of improved fiscal terms and risk reduction may result in an overall situation where the project would be considered profitable and attractive by the producers. From that point onwards it would be the actual development of LNG market conditions that would determine when the project could be launched in the 2005 - 2010 time period.

9.4 OTHER FACTORS

Apart from the three factors indicated above, further factors could help in bringing the project about.

A shorter ramp-up time of 4.5 or 5 years could add another 0.5% to the Project ROR. Based on the new fiscal package and the risk reduction agreement with the State of Alaska, it might be possible to convince buyers that a faster ramp up would be attractive.

Attractive financing arrangements could further help the project by improving the profitability on a Project ROE basis. The rating of the Alaska project could be improved considerably on an ROE basis, due to the favorable US tax treatment of financing and the fact that more favorable financing conditions can be assumed. The State could help with providing financing for some project components.

It should be noted that CIF gas price increases would not necessarily help in bringing the project closer. Other LNG projects in the world would benefit equally from price increases and because of the smaller size and faster ramp up of these projects the positive impact of price increases is stronger for such projects. This means that it would not be a good strategy for Alaska to simply wait for higher gas prices.